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SOIL SERIES
of
ASSAM

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In Co-operation with:
Department of Agriculture
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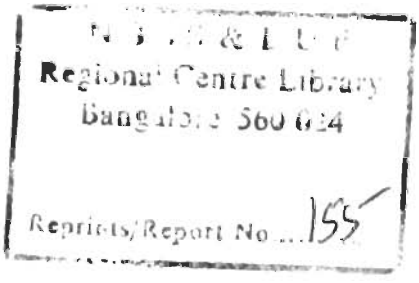
of
ASSAM



About the NBSS & LUP

The National Bureau of Soil Survey and Land Use Planning (NBSS & LUP), Nagpur, a premier Institute of the Indian Council of Agricultural Research (ICAR), was set up in the year 1976 with the objective of preparing soil resource maps at state and district level and to provide research inputs in soil resource mapping and its applications, land evaluation, land use planning, land resource management and database management using GIS for optimizing land use on different kinds of soils in the country.

The Bureau has been engaged in carrying our agro-ecological and soil degradation mapping at the country, state and district level for qualitative assessment and monitoring the soil health towards viable land use planning. The research activities have resulted in identifying the soil potentials and problems, and the various applications of the soil surveys with the ultimate objective of sustainable agricultural development. The Bureau has the mandate to correlate and classify soils of the country and maintain a National Register of all the established soil series. The Institute is also imparting in-service training to staff of the soil survey agencies in the area of soil survey and land evaluation, soil survey interpretations for land use planning. The Bureau in collaboration with Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola is running post-graduate, teaching and research programme in land resource management, leading to M.Sc. and Ph. D. degrees.

The present effort of the NBSS & LUP is aimed at bringing out a comprehensive account of major ***soil series in the state of Assam*** *alongwith its database for applications in different areas and use by different organizations.*

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FOREWORD

Information on soil resource and its management is an important endeavour to all the sections of people. Everyone's livelihood, well being and future prosperity depend directly or indirectly on natural resources. The economy of all the sectors is also based on the soil resource available in the region specified. However, in recent years, the country experiences the rapidity in deterioration of soil resources. Though we inherited a cleaner and greener earth from our forefathers, we are eroding it value by stealing from future generations what is rightfully their inheritance. It is a matter of great concern to all of us that about 57 per cent of the total geographical area of the country is suffering from degradation caused by – water, wind, chemical and physical factors. Over 5.3 billion tons of top soil alone is lost every year through erosion resulting in a loss of around 8 M tons of plant nutrients. In addition, about 9.4 M ha land is suffering from waterlogging and soil salinity in varying degrees. Soil resource base is also shrinking at an alarming rate of 0.25 M ha/annum due to rapid industrialization and urbanization.

Water is another critical resource whose availability is continuously diminishing for agricultural use due to enhanced demand from other competitive sectors. Declining water tables in high potential – high productivity regions have raised the concerns like hydrological sustainability in intensively irrigated cropping systems areas – a backbone of India's food grain production. Quality of water resources is being deteriorated due to enhanced disposal of pollutants, sewage and effluents. The soil resource forms the basic sink for these elements. The surface, ground and rain water resources need to be efficiently managed in order to preserve and protect the soil productivity and to achieve the sustainability in agriculture.

It is widely recognized that preservation of biodiversity (more than 30,000 species) is a matter of insurance to sustain and improve agriculture, forestry and fisheries production. The modern concept of agroforestry provides ways and means for protecting fragile ecosystems and to moderate the harsh climates and enhances productivity on otherwise barren and wastelands.

The pros and cons of all the above issues lie in proper understanding of soil resource base for which there is a need for systematic categorizing of the land mass into defined soil units indicating their interrelationship and capability to respond to management.

Under such a challenging scenario it gives me a great pleasure to note that the Regional Centre, Jorhat of NBSS & LUP under the leadership of Dr. K. S. Gajbhiye, Director, has brought out a publication on the **Soil Series of Assam** describing their extent, problems, potential and needed ameliorative measures. The publication also presents a state of the art, knowledge for future perspectives for land resource management. I congratulate the team of scientists at Nagpur and at Regional Centre, Jorhat and those of the State Department of Agriculture, Govt. of Assam, who offered their support and cooperation in bringing out this publication.

The publication is extremely valuable for researchs, planners and policy makers of the state of Assam. I hope that this volume will help in better understanding of the soil resources in the state of Assam to formulate future research, development and extension programmes for sustainable land use.

(J. S. SAMRA)
Deputy Director General (NRM)

New Delhi

PREFACE

This bulletin is the outcome of many soil survey programs in the state of Assam. A systematic soil survey was started in Assam after the establishment of the Regional Centre of National Bureau of Soil Survey and Land Use Planning at Jorhat in the year 1979. The scientists of this centre studied mapped soils of the districts of Jorhat, Sibsagar, Morigaon and Kamrup at the scale of 1:50,000. These programs continued for a decade. Later on, soil mapping of Assam State was undertaken at the scale of 1:250000 (SRM Project) and soils were mapped as association of soil family.

The soil series identified earlier in the districts of Jorhat, Sibsagar, Marigaon and Kamrup were co-related and included in this bulletin. For rest of the area in Assam, data (both field and laboratory) are available for large number of pedons studied during the soil resource mapping of Assam. The data were grouped district-wise and soil series were identified by grouping soils that have horizons similar in arrangement and in differentiating characteristics.

We take this opportunity to clarify some of the related concepts of soil series. The concept and definition of soil series have changed greatly with time. When Kellog (1937) defined series as "a group of soils having genetic horizon similar as to differentiating characteristics and arrangement in the soil profile, and developed from a particular type of parent material" the series criteria included spatial area. Later, the concept of "mappable differences" was recognized. Mappable differences in one area within which soils belonging to a series were present did not prove "mappable" in other areas, or at different mapping scales, that included similar profiles. Mappability as criteria was dropped from the concept of a series. Although at one time a series was a "mapping entity", it is now a "taxonomic entity".

We made sincere attempt to collect data of soils from all the available sources. The publication includes 107 soil series. We admit that there may be many more soils which we could not identify. Assam has a very complex soil forming environments that result in numerous soils. The soils vary with the composition of alluvial deposits, moisture regime, leaching, oxidation-reduction and vegetation. The conditions in (Assam) Purvachal, Karbi Plateau and Cachar hills are totally different from the valleys. These hills have a complex geology, vegetation and rainfall pattern which affect the formation and properties of soils. The density of vegetation decides removal of soil by water. In short, the soils of the valleys differ due to hydrological regime, leaching and particle size composition of the alluvium, whereas the soils of the hills vary due to the slope, intensity of leaching and vegetation.

We also made attempts to evaluate the suitability of these soils for growing commonly cultivated crops using a standard evaluation procedure. The results of evaluation are given with the series description.

The usefulness of this bulletin depends on the state of knowledge of the person using it. We are sure, the information provided will enrich the understanding of soil science by the teachers and students, and the staff of Agricultural and soil conservation departments. The information will also help in the future soil mapping programs. This bulletin has a lot of useful information. What is needed is an interface between these data and the users. The farmers, given the present level of knowledge, can not access directly to these data. The staff of Agricultural department has to translate it into easily understandable language for the farmers. If the soils of a farmer are identical to any of these soils, then the information on suitability to crops can be correlated for managing those soils.

Through this bulletin , we made sincere attempts to help the people of Assam by giving information on the soils of the state. We hope these information will be used for agriculture and related activities. We wish the people of Assam a prosperous Agriculture.

Nagpur
2004

K.S. Gajbhiye
Director

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CONTENT

1 INTRODUCTION

Location and extent

Assam is situated in the north-eastern part of India. It is bounded by two foreign countries and seven Indian states. To the north of it is Bhutan and Arunachal Pradesh. There are Arunachal Pradesh, Nagaland and Manipur in the east. The southern boundary is shared by Mizoram and Meghalaya. West Bengal, Bangladesh and Tripura form the western boundary. The total area is 78,523 km^2.

Topography : Assam can be divided in four topographic regions as given below (Fig.1).

1. The Brahmaputra Plain
2. The Barak Plain
3. The Karbi Plateau
4. The North Cachar Hills

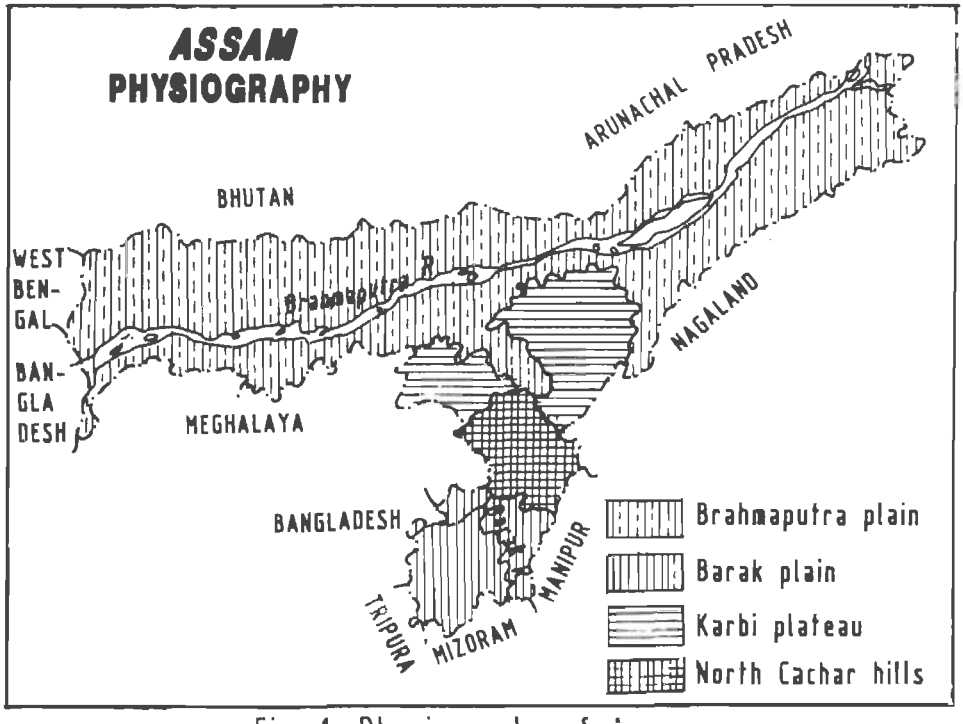

Fig. 1. Physiography of Assam

1) The Brahmaputra Plain : The Brahmaputra Plain is an alluvial plain with a length of about 772 km and an average width of about 80 km. It is bounded on the north by the Bhutan and Arunachal Himalayas, on the east by the hills of Patkai and its branches in Purvachal and Nagaland and the plateaus of Karbi and Meghalaya.

The plain as a whole slopes down towards southwest in the upper part and west in the middle and lower parts. But the gradient is extremely gentle. The altitude of Kobo near the trijunction of the rivers, Dihang, Dibang and Lohit is 130 m and the altitude at Dhubri is about 28 m above mean sea level. The average fall of gradient is only 13 cm per kilometer. Such a low gradient is one of the principal causes of frequent occurrence of floods in the plains following heavy rains during the southwest monsoon. The plain has a series of hillocks on either bank of the Brahmaputra, especially in its middle and lower parts. These hillocks are made of old granitic and gneissic rocks and geologically part of the Karbi-Meghalaya Plateau.

Although the Brahmaputra plain is flat, it varied topographically. In the northern part along the Himalayan foot hill there is a narrow high zone made up of coarse river deposits. This zone is known as Bhabar zone and supports dense forest. To the south of the Bhabar zone and parallel to it,

there is the Tarai zone where the ground remains damp under tall grasses. To the south of Tarai lies the alluvial zone where the density of population is very high, and it is the seat of developmental activities. To the south of this high activity zone lies the lowlying flood plains of Brahmaputra supporting a series of beels, marshes and swamps. As the Brahmaputra is a braiding river, its water flows through several winding channels within its bed forming many riverine islands, some temporary and some semi permanent locally known as *Chars* or *Chaparies*.

The south bank plain is irregular in width and receives sediments from Purvachal and Meghalaya-Karbi Plateau. It is wide in the upper part, moderately wide in Nagaon and constricted westward. Along the foot hill region, there are higher grounds known as terraces created by erosional activities of the rivers. These terraces are densely forested or occupied by the tea gardens in the upper part and by deciduous forests and dispersed settlements in the lower part. To the north of this belt of terraces, there lies the zone of settlement which has a dense population and intense agriculture and related activities. A zone of beels (marshes and swamps) extents from the settlement zone up to the south bank.

2) The Barak Plain : It is the headward part of the larger Barak-Surma-Meghna Plain, the major part of which now falls in Bangladesh. It is surrounded in the north by North Cachar Hills, in the east by the Manipur Hills. It is open only to the west. The total area of the plain is about 6962 km^2. The gradient of the plain from east to west is very low (from 75 m to 51 m) and the river Barak flows over it through an extremely meandering course. It has scattered isolated low hillocks with height 100 m or less. The middle part of it contains numerous swamps close to the river bank.

3) The Karbi Plateau : Geographically it is ancient and a part of the Deccan Plateau. It covers Karbi Anglong district spread over two separate areas. The Hamren sub-division is physiographically a part of the Jaintia Hills of the Meghalaya Plain and is separated from the Karbi Plateau by the Kapili-Jamuna Plain, which is oval in shape and highly dissected. It gives out many streams to the surrounding low land of Golaghat and Nagaon districts.

4) The North Cachar Hills : It lies contiguous to the Karbi Plateau. The hills here are made of folded sedimentary rocks and were raised during the later part of the Himalayan mountain building movement. The hills generally have NE-SW alignment and lie between Karbi Plateau in the north and Barak Plain in the south. It is in this district that the highest hill range of Assam viz. the Barail Range lies. It extends from the south-eastern boundary of the Meghalaya Plateau and runs across the North Cachar Hills district and Nagaland and ultimately joins the Patkai Range in the Indo-Myanmar border. The Barail Range acts as the divider of the Brahmaputra and the Barak river basins.

Drainage Systems : Assam is drained by two large rivers, viz. the Brahmaputra and the Barak. The Brahmaputra is one of the largest rivers in the world. The river, from its source in Tibet to its confluence with the Ganga in Bangladesh is about 2880 km long. Of which 1700 km falls in Tibet, 920 km in India and the remaining 260 km in Bangladesh. The portion of the river that falls in Assam is about 700 km.

The upper course of the Brahmaputra lies in the Tibet is known as Tsangpo (Fig.2). It rises in the Kailash range at an elevation of about 5150 m. The river is called Dihang when it enters Siang Division of Arunachal Pradesh in a south-westerly course. At a point near Sadiya, it is joined by the Dibang from the north and Lohit from the east and it is from this point that the waters of the three streams flow as the mighty Brahmaputra. The river catchment is characterized by very steep hill slopes with light texture and unstable soil mass. This causes high instantaneous run-off and heavy siltation in the tributaries as well as the channel of Brahmaputra. It has 41 important tributaries – 26 located on the North bank and 15 on the South bank in addition to the 3 main tributaries – the **Dihang**, the **Dibang** and the **Lohit**.

The Barak is also an important river of Assam. It rises on the Southern slopes of the lofty Barail Range near the border of Manipur and Nagaland. It flows southwesterly to Tipaimukh where it sharply turns to north. After its junction with river Jiri it turns to west and meanders through Cachar

(Silchar, Hailakandi and Karimganj) district. After reaching Sylhet (Bangladesh), the river is divided into two branches, the southern arm called the Kushiyara, while the northern branch is known as Surma. The total length of Barak from its confluence with the old course of Brahmaputra near Bhairab Bazar (Bangladesh) is about 900 km, out of this only 192 km lie in Cachar (Baruah and Roy Choudhury, 1999). It has numerous tributaries on its course of flow. The main northern tributaries are the **Jiri**, the **Chiri**, the **Modhura**, the **Jatinga**, the **Harang**, the **Kalnin** and the **Gumra**. The main south bank tributaries are the **Sonai**, the **Katakhal**, the **Dhaleswari**, the **Singla** and the **Longai**.

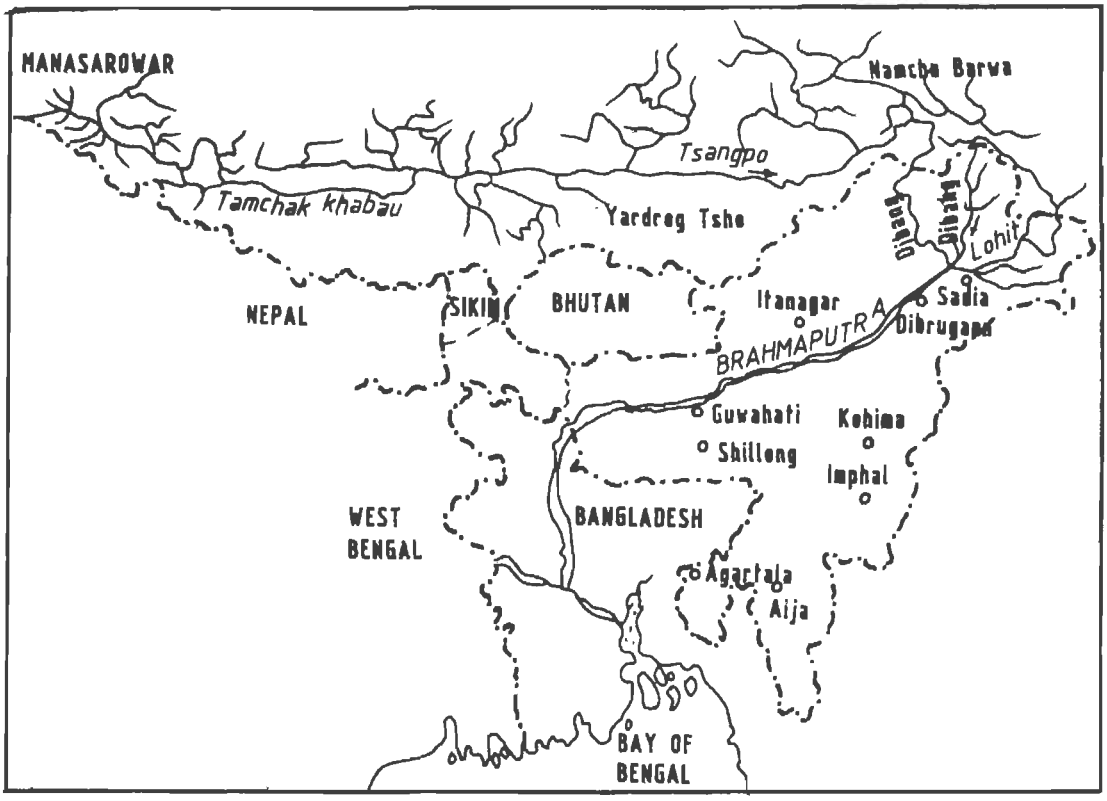

Fig. 2. Route of the river Brahmaputra

Geology : With regard to the geological history of the earth, only the Archaean, the late Cretaceous, Tertiary and Quaternary are represented in Assam. The geology of Assam is the product of an ancient landmass caught up in the collision zones of three other landmasses. These were originally its neighbours, but drifted apart with the break up of the Gondwana land. Later they collided again to produce the present geological and continental framework. Geologically, the Brahmaputra and Barak valleys are built up by deposition of alluvium of several hundred meters. The Karbi Plateau is dominated by Pre-Cambrian rocks. Monadnocks of such rocks are found near Tezpur, Nagaon, Guwahati, Goalpara and Dhubri. The Barail range and Naga hills are dominated by Tertiary sandstones and related rocks.

Flora : According to the type of flora and nature of vegetation found in it, the forests of Assam may broadly be divided into 1) Evergreen forests, 2) Mixed deciduous forests, 3) Riverine forests and 4) Savannah.

Generally, the evergreen forests are found in the districts of Cachar (undivided), Goalpara, Nagaon, Kamrup, Lakhimpur, Dibrugarh, Darrang, Karbi Anglong and North Cachar Hills. The major portions of the mixed deciduous forests are at stages of succession towards climax forests with tendency towards turning to evergreen if left to nature without human interference or grazing. Most of these forests are found along the main river banks. The riverine forests of the state are mainly found along the banks of the big streams and *chars* of big rivers. The Savannah type of forests occurs in patches in most of the reserve forests of the state.

2 ABOUT SOIL SERIES

Soil series is the most detailed category in Soil Taxonomy and differentiated within family criteria. Series are, therefore, the most homogeneous taxa recognized in Soil Taxonomy.

The definition of soil series, however, has been changing with time. In the late thirties, Kellogy (1937) defined soil series as "a group of soils having genetic horizons similar as to differentiating characteristics and arrangement in the soil profile, and developed from a particular type of parent material". The differentiae from higher categories were not imposed on series. Instead, emphasis was placed on recognition of mappable differences in the profiles significant to growth of plants. Clearly, the concept of series had criteria that included spatial area.

Later, the concept of "mappable differences" was recognized as causing confusion. Because, mappable differences in one area within which soils belonging to a series (because of profile similarity) were present did not prove "mappable" in the other areas, or at different mapping scales.

By 1993, soil series were defined "as a class, a series is a group of soils or polypedons that have horizons similar in arrangement and in differentiating characteristics" (Soil Survey Staff 1993). Mappability as a criterion was dropped from the concept of a series. It was clearly stated that "when the limits of soil taxa are superimposed on the pattern on soil in nature, areas of taxonomic classes rarely, if ever, coincide with mappable areas" (Soil Survey Staff, 1993).

Soils series, although recognized as a category in soil classification for many years, the concept and definition have changed greatly with time. Although at one time a series was a **mappable** entity, it is now a **taxonomic** entity. Therefore now, a mapping unit, utilizing series names for identity of the dominant soils in that unit, or soils as in complex mapping unit, encompasses the "mappability" criteria used to define series in the past.

The reason for this shift in concept is further clarified by the USDA soil survey manual as follows. "The polypedons considered in Soil Taxonomy as a unit of Soil classification is a soil body homogeneous at the series level, and big enough to exhibit all the soil characteristics considered in the description and classification of soils. In practice, the concept of polypedon has been largely ignored and many scientists consider a pedon or some undefined body of more or less similar soil represented by a pedon large enough to classify. Polypedons seldom, if ever, serve as the real thing we want to classify because of the extreme difficulty of finding the boundary of a polypedon on the ground and because of the self contradictory and circular nature of the concept. Soil scientists have classified pedons, regardless of their limited size, by deliberately or unconsciously transferring to pedon any required extensive properties from the surrounding area of the soil.

George Holmgren incorporated this pragmatic, flexible view of the pedon in his proposal of the point pedon which combines the fixed position of a pedon with consideration of whatever area is needed to identify and measure the properties under consideration (Holmgren, 1988). This concept, combined with criteria for the scale of lateral variability to be considered within one kind of soil, could establish the pedon as the basic unit of classification and eliminate the need for the polypedon.

How to differentiate soil series

By definition, soil series is the most homogeneous grouping of soils made in Soil Taxonomy. Soil series are differentiated on all the differentiae of the higher categories plus those additional and significant characteristics in the series control section. Some of the characteristics commonly used to differentiate series are the kind, thickness, and arrangement of horizons and their structure, colour, texture, reaction, consistence, content of carbonates and other salts, contents of humus, content of rock fragments, and mineralogical composition. A significant difference in any one of these can be the basis for recognizing a different series.

However, there are few specific limitations on selecting criteria for different series that are classified within the same family. All series within the same family are referred to as **competing series**. Series description must fully state how that series differs from each of the other series in the same family.

In this bulletin, information on 107 soil series are presented districtwise, as the district is administrative unit for planning and implementation of the developmental programme.

Suitability of the soils to crops

An attempt has been made to assess the suitability of these soils to commonly cultivated crops. We employed the method proposed by Sys *et al.* (1993) for this purpose. This method recognizes five land suitability classes viz. suitable (S1), moderately suitable (S2), marginally suitable (S3), unsuitable at present but potentially suitable (N1) and actually and potentially unsuitable (N2). This method also identifies dominant limitations that restrict the crop growth.

The characteristics of these soil series were matched with the requirement of the crops at different limitation levels. The suitability class is decided by the most limiting soil characteristics.

Soil classification

The soils were classified according to *Soil Taxonomy* (Soil Survey staff 1999). In some cases we could not strictly follow the rules of *Soil Taxonomy*. We made deviations to make the classification more meaningful in terms of application. An example is given below.

In case of Humic Endoaquept, The rules are, i. A colour value moist of 3 or less in the Ap horizon and ii. A base saturation of less than 50 percent.

However, some of the Assam valley soils have less than 50 percent base saturation with colour value moist, 4. In such circumstances the colour value criteria was ignored and the soil was placed in *Humic* subgroup to accommodate soils with low base saturation.

Important 107 soil series observed in the state are described in following pages. The description includes the details about their occurrence, range in physical and chemical characteristiscs, and crop suitability evaluation to assess their production capacity.

1. BAUNGAON SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Dystric Eutrudepts*.
Type location	:	27°9'32" N Latitude, 93°51'39" E longitude; Village: Ranga reserve forest, District: Lakhimpur
Profile No.	:	83 E / GP-1
Physiographic position	:	Piedmont plain of North part of Lakhimpur
Elevation (m)	:	100-120 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	3020 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope) moderate erosion
Drainage & permeability	:	Well drained with moderately low saturated hydraulic conductivity
Land use and vegetation	:	Rice in rainy season and mustard in winter
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Lakhimpur district (15,650 ha)
Soil series associated	:	Jiyadhol series

Typifying pedon : Baungaon silt loam – cultivated.

Ap	0-13 cm	Grey (10YR 6/1 M) silt loam; weak medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common very fine iron-manganese concretions, common fine roots; strongly acid (pH 5.3); clear smooth boundary.
Bw1	13-33 cm	Pale brown (10YR 6/3 M) silty clay loam; weak medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common very fine iron-manganese concretions; few fine roots; strongly acid (pH 5.5); clear smooth boundary.
Bw2	33-62 cm	Light yellowish brown (10YR 6/4 M) silt loam; weak medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and non plastic when wet; common, fine iron manganese concretions; few fine roots; strongly acid (pH 5.1); clear smooth boundary.
BC	62-112 cm	Yellow (10YR 7/8 M) loam; weak medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and non plastic when wet; common, fine, iron manganese concretions; strongly acid (pH 5.2).

Range in characteristics : Baungaon soils are very deep. The A horizon is 12 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 6, chroma 1 to 3. The texture is silt loam or silty clay loam. The structure is weak or moderate, medium or fine, subangular blocks. The B horizon is 50 to 70 cm thick and has 2 or more sub-horizons differing in colour and texture. Its colour is in the hue 10YR, value 4 to 6 and chroma 3 to 4. The texture is silty clay loam or silt loam. The structure generally is weak, medium subangular blocks. The C horizon or BC horizon generally occur below a depth of 80 to 100 cm. The Baungaon soils are strongly acid.

Interpretation : They receive enough rain in summer and retain some moisture and therefore remain moist fo r more than 275 days in normal years.They are strongly acid and poor in availability of K.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low organic matter, low fertility
Mustard	Moderately suitable	Low pH, low organic matter, low fertility
Wheat, cabbage, tomato, potato, beans, cowpea	Marginally suitable	Low pH, low organic matter, low fertility
Pea	Not suitable	Low pH, low fertility
Tea	Marginally suitable	Low organic matter

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	17.8	57.7	24.5	7.5	10.3	-
13-33	15.0	55.5	29.5	7.8	7.2	-
33-62	30.0	50.5	19.5	18.5	11.5	-
62-112	40.4	40.1	19.5	12.8	27.6	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	0.90	-	5.3	-
13-33	0.61	-	5.5	-
33-62	0.25	-	5.1	-
62-112	0.33	-	5.2	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-13	4.60	0.39	0.07	1.1	0.11	10.24	49.41	0.42
13-33	6.80	0.43	0.06	0.7	0.1	11.26	64.74	0.38
33-62	5.0	0.43	0.07	1.1	0.8	8.96	61.38	0.46
62-112	4.0	0.56	0.04	0.6	0.8	7.94	57.93	0.41

2. JIYADHOL SERIES

Classification	:	Mixed, hyperthermic family of *Typic Udipsamments*
Type location	:	29°50'11" N Latitude, 95°19'35" E longitude Village Oryam Ghat, district North Lakhimpur, Assam.
Profile No.	:	83M/G 23/M$_1$
Physiographic position	:	Very gently sloping recent alluvial plain
Elevation (m)	:	125 m above MSL
Groundwater table	:	1.5 m.
Rainfall	:	3020 mm.
Slope, erosion &relief	:	Very gently sloping (0-1 % slope), very slight erosion
Drainage & permeability	:	Well drained and moderately high saturated hydraulic conductivity
Landuse and vegetation	:	Mustard, potato, pigeonpea, blackgram
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Lakhimpur (1,915 ha) and Dhemaji (11,837 ha) districts
Soil series associated	:	Baungaon series

Typifying pedon : Jiyadhol sandy loam – cultivated.

Ap	0-18 cm	Dark brown (10YR 3/3 M) sandy loam; weak medium subangular blocky structure; loose when dry, very friable when moist, non sticky and non plastic when wet; many medium pores, common very fine roots; strongly acid (pH 5.5); gradual smooth boundary.
C1	18-48 cm	Dark yellowish brown (10YR 3/4 M) loamy sand; single grain structure; loose when dry, very friable when moist, non sticky and non plastic when wet; many coarse pores; few very fine roots; moderately acid (pH 5.9); gradual smooth boundary.
C2	48-170 cm	Dark yellowish brown (10YR 3/6) sand; single grain structure; very friable when moist; many coarse pores; few very fine roots; moderately acid (pH 5.9).

Range in characteristics : Jiyadhol soils are deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue of 10YR, value 3 to 5 and chroma 3 to 4. The texture is sandy loam or loamy sand. The structure generally is single grain, however, at some places weak formation of subangular blocks was observed. The A horizon is strongly acid. The C horizon follows the A horizon and has 2 or more sub horizons differing in colour and texture. Its colour is in the hue 10YR, value 3 to 5 and chroma 4 to 6. The texture is generally sand, however, loamy sand is observed in the upper part at some places. The structure is single grain (no structural development). The C horizons are moderately acid, one class lesser acid than the surface horizons.

Competing series and their differentiae : The Sonitpur series identified in Sonitpur district is competing series. Sonitpur soils have pH of 4.6 to 5.3 in upper 50 cm and pH increases to 5.9 below 50 cm. Sonitpur soils have higher organic carbon content (2.3 to 3.8 percent) in upper 40 cm.

Interpretation : They are strongly acid in surface horizons and thereafter moderately acid and have low available potassium content.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Excessively drained, coarse texture
Mustard, tomato, beans, cowpea	Moderately suitable	Low pH, low base saturation, low fertility, coarse texture
Wheat, cabbage, pea	Marginally suitable	Low pH, low fertility, coarse texture, low water availability
Potato	Suitable	No limitation

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-18	71.5	21.0	7.5	1.9	69.6	
18-48	79.9	13.1	7.0	2.9	77.0	
48-170	89.9	4.1	6.0	2.3	87.6	

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-18	1.61	-	5.5	-
18-48	1.19	-	5.9	-
48-170	0.56	-	5.9	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-18	2.69	0.31	0.06			7.17	42.7	0.95
18-48	1.73	0.36	0.03			4.86	43.6	0.69
48-170	0.96	0.30	0.13			3.07	45.27	0.51

3. BALIPARA SERIES

Classification	:	Fine loamy, mixed, Hyperthermic family of *Dystric Fluventic Eutrudepts*
Type location	:	26°49'32" N Latitude 92°43'0" E Longitude; Village Balipara, district Sonitpur, Assam.
Profile No.	:	83B/P-105
Physiographic position	:	Very gently sloping flood plain
Elevation (m)	:	50-70 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1750 mm.
Slope, erosion &relief	:	Very gently sloping 0-1%), None to very slight erosion
Drainage & permeability	:	Well drained and low saturated hydraulic conductivity
Landuse and vegetation	:	Rice
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Sonitpur (14,274 ha) and Darrang (52,390 ha) districts
Soil series associated	:	Sonitpur series

Typifying pedon : Balipara clay loam - cultivated

Ap	0-11 cm	Light yellowish brown (10YR 6/4 M) clay loam; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; few medium roots; slightly acid (pH 6.4); clear smooth boundary.
Bw1	11-49 cm	Very pale brown (10YR 7/4 M) clay loam; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, moderately sticky and moderately plastic when wet; yellowish brown mottles (10YR 5/4); few fine roots; slightly acid (pH 6.5); gradual smooth boundary.
Bw2	49-90 cm	Light yellowish brown (10YR 6/4 M) clay loam; massive structure; slightly hard when dry, firm when moist, slightly sticky and slightly plastic when wet; very pale brown (10YR 7/4) mottles, few fine roots; slightly acid (pH 6.4); gradual smooth boundary.
C	90-132 cm	Pale brown (10YR 6/3 M) clay loam; massive structure; slightly hard when dry, firm when moist, slightly sticky and slightly plastic when wet; brown (10YR 5/3) mottles, slightly acid (pH 6.5).

Range in characteristics : The soils are very deep. The A horizon is 10 to 18 cm thick. Its colour is in the hue 10YR, value 4 to 6, chroma 3 to 4. Texture is clay loam or loam. Structure is moderate, medium or fine, subangular blocks. The B horizon is 50 to 75 cm thick. The colour is in the hue 10YR, value 5 to 7, chroma 3 to 4. The texture is clay loam or loam. The structure is moderate medium subangular blocks in the upper part and massive in the lower part. Yellowish brown mottles are common. The C horizon occurs below a depth of 60 to 90 cm. Its colour is in the hue 10YR, value 4 to 6, chroma 3 to 4. The texture is clay loam or loam or silty clay loam. Brown mottles are common. The structure is massive.

Competing series : No competing series is identified.

Interpretation : They are slightly acid with high base saturation. The available K is low.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture
Cabbage, potato, wheat	Suitable	No limitation
Mustard, tomato, beans, pea, cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-11	36.0	32.0	32.0			
11-49	42.0	26.0	32.0			
49-90	40.5	29.5	30.0			
90-132	45.0	23.3	31.7			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-11	1.15	-	6.4	-
11-49	0.98	-	6.5	-
49-90	0.76	-	6.4	-
90-132	0.42	-	6.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base satura-tion (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-11	4.9	0.50	0.11	0.8	0.5	11.0	80.9	0.34
11-49	5.16	0.42	0.14	0.8	0.5	11.5	81.5	0.36
49-90	5.3	0.72	0.15	0.8	0.5	10.8	82.6	0.36
90-132	5.37	0.48	0.19	0.8	0.5	12.5	82.3	0.39

4. BHARALI SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquepts*
Type location	:	26°50'26" N Latitude, 93°3'39" E Longitude; Village Rangauli Sonari, district Sonitpur, Assam
Profile No.	:	83F / P-66
Physiographic position	:	Very gently sloping alluvial low land
Elevation (m)	:	50-70 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1750 mm.
Slope, erosion &relief	:	Very gently sloping (1-3% slope), very slight erosion
Drainage & permeability	:	Drainage is poor in the rainy season and it improves in winter. Saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Sonitpur (28,514 a), Nalbari (57,206 ha) and Barpeta (45,234 ha) districts
Soil series associated	:	Tezpur series

Typifying pedon : Bharali - clay loam - cultivated

Ap	0-15 cm	Grey (10YR 5/1 M) clay loam; moderate, medium subangular blocky structure; slightly hard when dry, firm when moist, moderately sticky and slightly plastic when wet; few medium roots; moderately acid (pH 5.9); clear smooth boundary.
Bw1	15-40 cm	Dark grey (10YR 4/1 M) silty clay loam; moderate medium subangular blocky structure; slightly hard when dry, firm when moist, moderately sticky and moderately plastic when wet; few fine roots; moderately acid (pH 6.0); gradual smooth boundary.
Bw2	40-110 cm	Reddish grey (5YR 5/2 M) silt loam; massive structure; slightly hard when dry, friable when moist, slightly sticky and non plastic when wet; moderately acid (pH 5.9); clear smooth boundary.
C	110-150 cm	Yellowish red (5YR 5/6 M) silty clay loam; massive structure; slightly hard when dry, firm when moist, moderately sticky and moderately plastic when wet; many coarse distinct dark grey (10YR 4/1) mottles; slightly acid (pH 6.5).

Range in characteristics : Bharali soils are very deep. The A horizon is 12 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 5, chroma 1 to 2. Texture is clay loam or loam or silty clay loam. The structure is moderate, medium or fine, subangular blocks. The B horizon is 75 to 90 cm thick. Its colour is in the hue 10YR to 5YR, value 4 to 5, Chroma 1 to 2. The structure is moderate medium subangular blocks in the upper part and massive in the lower part. The C horizon is observed generally at a depth of 100 cm. Its colour is in the hue 10YR, 7.5YR or 5YR, value 4 to 6, chroma 4 to 6. The texture is silt loam or silty clay loam. The structure is massive. Low chroma mottles are common. The surface horizons are moderately acid while the subsurface horizons are slightly acid. Roots are observed up to a depth of about 50 cm.

Competing series : The Nalbari soil series identified in Nalbari district is a competing series. Nalbari soils have 28 to 33 percent clay throughout depth. They have colours in the hue 10YR throughout the depth.

Interpretation: They are moderately acid in the surface and have low available K content.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Cabbage, potato, wheat	Suitable	No limitation
Mustard, tomato, beans, pea, cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	30.0	34.9	35.1			
15-40	18.2	52.9	28.9			
40-110	24.7	59.7	15.6			
110-150	18.6	50.3	31.1			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.10	-	5.9	-
15-40	0.93	-	6.0	-
40-110	0.75	-	5.9	-
110-150	0.45	-	6.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	5.08	0.67	0.10	1.5	1.3	10.2	67.6	0.29
15-40	5.08	0.72	0.09	1.4	1.2	10.1	69.4	0.35
40-110	1.9	0.16	0.14	1.5	1.3	6.5	44.0	0.42
110-150	3.94	0.39	0.13	0.6	0.1	10.0	86.4	0.32

5. SONITPUR SERIES

Classification	:	Mixed, hyperthermic family of *Typic Udipsamments.*
Type location	:	26°53'21" N Latitude, 92°47'30" E Lognitude; Village Chengalimari, district Sonitpur, Assam.
Profile No.	:	83 B/S1/M3
Physiographic position	:	Gently sloping recent flood plain
Elevation (m)	:	50-70 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	1750 mm
Slope, erosion &relief	:	Very Gently sloping (1-3% slope), moderate erosion
Drainage & permeability	:	Well drained and saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Rice, potato, sal , Ajar and grasses
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Sonitpur district (9,527 ha)
Soil series associated	:	Balipara series

Typifying pedon: Sonitpur sandy loam - fallow.

Ap	0-15 cm	Very dark brown (10YR 2/2 M) sandy loam; weak medium subangular blocky structure; very friable, slightly sticky and non plastic; many, very fine and common pores; few, coarse and many, very fine and fine roots; very strongly acid (pH 4.6; gradual smooth boundary.
C1	15-33 cm	Very dark brown (10YR 2/2 M) sandy loam; weak fine subangular blocky structure; very friable, slightly sticky and non plastic; many, very fine and common fine pores; few, coarse and few, very fine and fine roots; very strongly acid (pH 4.8); clear smooth boundary.
C2	33-45 cm	Dark brown (10YR 3/3 M) loamy sand; single grain structure; loose, non sticky and non plastic; many, very fine pores; few, medium and few, very fine roots; strongly acid (pH 5.3); gradual smooth boundary.
C3	45-120 cm	Very pale brown (10YR 7/3 M) sand; loose, non sticky and non Plastic; many, very fine pores; few, very fine and fine roots; moderately acid (pH 5.9).

Range in characteristics : Sonitpur soils are very deep. The A horizon is 15 to 20 cm thick. Its colours is in the hue 10YR, value 2 to 4, chroma 2 to 3. The texture is sandy loam or loamy sand. The structure is weak, medium or fine, subangular blocks. The C horizon is generally below 15 to 20 cm. It has colours in the hue 10YR, value 2 to 7, chroma 2 to 3. The texture is loamy sand or sand. This horizon does not have structural development, however, there are some weakly developed peds in the upper part of C horizon directly below the A horizon. These soils are very strongly acid in the upper 30 cm and thereafter it is strongly or moderately acid.

Competing series : The Jiyadhol soil series identified in North Lakhimpur district is competing series. Jiyadhol soils have pH of 5.5 to 5.9 through depth. They have about 1.5 percent organic carbon in surface horizon which decreases with depth.

Interpretation : They are very strongly acid in the surface with low available potassium content.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low pH
Potato	Marginally suitable	Low pH, coarse texture, low water availability
Mustard, cabbage, tomato, wheat, beans, pea, cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	74.5	15.5	10.0	5.6	68.9	-
15-33	77.6	13.4	9.0	4.3	73.3	-
33-45	87.7	4.3	8.0	5.7	82.0	-
45-120	94.0	1.0	5.0	0.8	93.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	3.76	-	4.6	-
15-33	2.37	-	4.8	-
33-45	0.06	-	5.3	-
45-120	0.30	-	5.9	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base satura-tion (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	0.80	0.40	0.08	0.40	1.6	9.2	39.0	0.92
15-33	0.60	0.37	0.05	0.36	1.14	7.59	40.5	0.84
33-45	0.40	0.39	0.02	0.17	0.23	2.99	66.9	0.37
45-120	0.60	0.40	0.01	0.30	-	1.38	77.1	0.28

6. TEZPUR SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Humic Endoaquepts*.
Type location	:	26°53'37" N Latitude, 93°28'0" E Longitude; Village Silanijan, district Sonitpur, Assam.
Profile No.	:	83F/P-14
Physiographic position	:	Nearly level to gently sloping low lands of the flood plain
Elevation (m)	:	50-70 m above MSL.
Groundwater table	:	1-5 m
Rainfall	:	1847 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1%), very slight erosion
Drainage & permeability	:	Poor in rainy season ,improves in post rainy period and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice and vegetable crops
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Tezpur district (36,334 ha)
Soil series associated	:	Bharali

Typifying pedon : Tezpur clay loam – cultivated.

Ap	0-24 cm	Black (10YR 2/1 M) clay loam, moderate, medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; many, fine roots; strongly acid (pH 5.4); gradual smooth boundary.
Bwg1	24-67 cm	Grey (10YR 6/1 M) sandy loam; moderate, medium, subangular blocky structure; soft when dry, very friable when moist, slightly sticky and non plastic when wet, few fine, roots; moderately acid (pH 5.6); clear smooth boundary.
Bwg2	67-100 cm	Grey (10YR 5/1 M) sandy clay loam; massive structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; few, fine roots; slightly acid (pH 6.1).

Range in characteristics : Tezpur soils are very deep. The A horizon is 15 to 20 cm thick. It has colour in the hue 10YR or 2.5Y, value 2 to 3, chroma 1 to 2. The texture is clay loam or loam. The structure is moderate, medium or coarse, subangular blocky. The B horizon is 60 to 80 cm thick and has 2 or more sub horizons. It has colours in the hue 10YR or 2.5Y, value 4 to 6, chroma 1 or 0. The texture is sandy clay loam or sandy loam. The structure is generally moderate, medium, subangular blocks, however massive structure is observed in the lower part of B horizon in some pedons. These soils are strongly acid in the surface horizon and acidity gradually decreases with depth to slightly acid. The roots are many in the surface and decreases to few in the subsoils up to a depth of 100 cm.

Competing series : No competing series is identified.

Interpretation : They are strongly acid in the surface and have low in available potassium content.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low pH, low fertility
Mustard, potato, bean	Moderately suitable	Low organic matter, low pH, low fertility, low base saturation
Wheat, cabbage, tomato, pea, cowpea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-24	36.1	34.7	29.2			-
24-67	53.9	30.6	15.5			-
67-100	51.7	25.8	22.5			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-24	1.12	-	5.4	-
24-67	0.60	-	5.6	-
67-100	0.46	-	6.1	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-24	2.45	0.28	0.09	2.00	1.80	8.72	42.6	0.29
24-67	1.23	0.19	0.06	1.80	1.60	6.48	30.3	0.42
67-100	1.95	0.21	0.10	1.20	1.00	6.56	50.7	0.29

7. DARRANG SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Endoaquepts.*
Type location	:	26°37'38" N Latitude, 91°49'35" E Longitude; Village Khairabari, district Darrang, Assam.
Profile No.	:	78 N /6
Physiographic position	:	Nearly level to gently sloping flood plains
Elevation (m)	:	40-60 m above MSL.
Groundwater table	:	5-10 m
Rainfall	:	1590 mm
Slope, erosion &relief	:	Nearly level to gently sloping (0-1% slope), none to very slight erosion
Drainage & permeability	:	Poor in rainy season ,improves in post rainy period and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, mustard, cabbage, potato, tomato
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Darrang district (20,706 ha)
Soil series associated	:	Dhansiri

Typifying pedon : Darrang clay loam – cultivated.

Ap	0-28 cm	Grey (10YR 5/1 M) clay loam; moderate, medium, subangular blocky structure; firm, sticky and plastic; many very fine and fine roots; moderately acid (pH 5.6); diffused smooth boundary.
Bwg1	28-46 cm	Dark grey (10YR 4/1 M) clay loam; moderate, medium, subangular blocky structure; firm, sticky and plastic; few very fine and fine roots; moderately acid (pH 5.7); diffused smooth boundary.
Bwg2	46-71 cm	Light brownish grey (10YR 6/2 M) clay loam; few fine, distinct red (2.5YR 5/6) mottles; massive structure; firm, sticky and plastic; few fine roots; moderately acid (pH 5.7); diffused smooth boundary.
Cg	71-108 cm	Grey (10YR 5/1) sandy clay loam; massive structure; friable slightly sticky and slightly plastic; few, fine, iron-manganese concretions; moderately acid (pH 6.0).

Range in characteristics: The Darrang soils are very deep. The A horizon is 15 to 30 cm thick. Its colour is in the hue 10YR or 2.5Y, value 3 to 5, chroma 1 to 2. The texture is clay loam or silty clay loam. The structure is moderate medium or coarse subangular blocks. The B horizon is 50 to 75 cm thick and has 2 or more sub horizons. It has colours in the hue 10YR or 2.5Y, value 3 to 6, chroma 1 to 2. It has high chroma (4 to 6) mottles, in the the hue of 7.5YR or redder. The texture is clay loam or sandy clay loam. The structure is generally moderate medium subangular blocks, however massive structure is observed in the lower parts of B horizon in some locations. The C horizon is generally below 70 to 100 cm. Its colour is hue 10YR or 2.5Y or 5Y, value 4 to 6 and chroma 1 to 2. The texture is clay loam or sandy clay loam. This horizon does not have well developed structure. Darrang soils are moderately acid throughout depth. They have soft Fe-Mn

concretions below the depth of 75 cm. The roots are concentrated in the surface. However few roots are observed up to the depth of 70 cm.

Competing series : The Barpeta soil series identified in Barpeta district is a competing series. Barpeta soils have sand content of about 25 percent. The pH ranges between 6.7 and 7.0 and base saturation between 83 and 92 percent.

Interpretation : They are moderately acid and have low available potassium content.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitations
Mustard, cabbage, tomato, potato, wheat, beans, pea, cowpea	Moderately suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-28	43.0	29.0	28.0			-
28-46	44.5	26.0	29.5			-
46-71	44.0	25.0	31.0			-
71-108	56.0	21.0	23.0			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-28	1.04	-	5.6	-
28-46	0.90	-	5.7	-
46-71	0.84	-	5.7	-
71-108	0.29	-	6.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-28	4.1	0.28	0.14	2.50	1.10	8.12	55.6	0.29
28-46	4.4	0.34	0.20	2.40	1.80	9.14	54.0	0.31
46-71	4.9	0.41	0.18	2.40	1.80	9.69	56.6	0.31
71-108	2.5	0.22	0.16	2.50	1.50	6.88	41.9	0.30

8. DHANSIRI SERIES

Classification	:	Mixed, hyperthermic family of *Typic Psammaquents.*
Type location	:	26°32'46" N Latitude, 92°23'25" E Longitude; Village Kazabil, district Darrang, Assam.
Profile No.	:	83 B / 15
Physiographic position	:	Very gently sloping active flood plains
Elevation (m)	:	40-60 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	1590 mm
Slope, erosion &relief	:	Nearly level to gently sloping (0-1% slope), none to very slight erosion
Drainage & permeability	:	Somewhat poor in rainy season ,improves to well drained in post rainy period and saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Rice, mustard, cabbage
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Darrang district (18,781 ha)
Soil series associated	:	Darrang

Typifying pedon: Dhansiri sandy loam – cultivated.

Ap	0-7 cm	Grey (10YR 5/1 M) sandy loam; weak fine subangular blocky Structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine and common medium roots; slightly acid (pH 6.1); gradual smooth boundary.
A2	7-18 cm	Dark grey to dark greyish brown (2.5Y 4/1 M) sandy loam; weak fine subangular blocky structure; friable, slightly sticky and non plastic; common fine and very fine roots; slightly acid (pH 6.2); gradual smooth boundary.
C1	18-40 cm	Grey to greyish brown (2.5Y 5/1 M) loamy sand; single grain Structure; friable, non sticky and non plastic; few fine roots; neutral (pH 6.8); gradual smooth boundary.
C2	40-110cm	Grey (2.5Y 5/0 M) loamy sand; few, fine, faint brown to dark brown (7.5 YR 4/4) mottles; single grain structure; friable, non sticky and non plastic; few fine roots; neutral (pH 6.8).

Range in characteristics : Dhansiri soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR or 2.5Y, value 4 to 6, chroma 1 to 2. The texture is sandy loam or loamy sand. The structure is weak, fine subangular blocks. The C horizon is generally below 20 cm and has 2 or more sub horizons. The colour is in the hue 10YR or 2.5Y, value 4 to 6, chroma 1 to 2. It has high chroma (4 to 6) mottles in the the hue of 7.5YR or redder. The structure is generally single grain. These soils are slightly acid up to the depth of 20 cm and thereafter neutral. The roots are many in the surface horizon and a few roots are observed up to the depth of 100 cm.

Competing series and their differentiae : The Jogighopa series identified in Bongaigaon district is competing series. Jogighopa soils have colours with chroma 2 to 4. The surface soil pH is less than 6.0.

Interpretation : They are slightly acid to neutral. They have low organic matter and low available potassium content.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low fertility
Cabbage	Moderately suitable	Low organic matter, coarse texture, low fertility
Mustard, tomato, wheat beans, pea, cowpea	Marginally suitable	Low organic matter, coarse texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-7	70.0	13.1	16.9			-
7-18	75.6	10.7	13.7			-
18-40	80.6	10.6	8.8			-
40-110	84.3	7.5	8.2			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-7	0.58	-	6.1	-
7-18	0.35	-	6.2	-
18-40	0.20	-	6.8	-
40-110	0.14	-	6.8	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-7	2.24	0.30	0.08	1.10	1.92	4.64	46.5	0.27
7-18	1.86	0.28	0.08	1.00	0.80	4.02	55.2	0.29
18-40	1.96	0.11	0.06	0.80	0.30	3.23	65.9	0.37
40-110	1.91	0.12	0.04	0.80	0.20	3.07	67.4	0.37

9. MAROA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Aeric Endoaquepts*.
Type location	:	26°45'0" N Latitude 91°21'18" E Longitude; Village Bhausrpur, district Nalbari, Assam.
Profile No.	:	78 N/P-65
Physiographic position	:	Very gently sloping alluvial plain
Elevation (m)	:	35-45 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2100 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), none to very slight erosion
Drainage & permeability	:	Somewhat poor in rainy season ,improves to well drained in post rainy period and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, potato, beans, tomato mustard,
Geology and parent material	:	Alluvium
Distributation and extent	:	Extensive in Sonitpur (17,852 ha) and Nalbari (20,197 ha) districts
Soil series associated	:	Nalbari and Tihu

Typifying pedon: Maroa clay loam – cultivated.

Ap	0-20 cm	Grey (10YR 6/1 M) silty clay loam; moderate medium subangular blocky structure; friable when moist, moderately sticky and slightly plastic when wet; many very fine pores; coarse, common roots; strongly acid (pH 5.5); clear smooth boundary.
Bw1	20-38 cm	Light yellowish brown (10YR 6/4 M) clay loam; moderate medium subangular blocky structure; friable when moist, moderately sticky and moderately plastic when wet; many fine pores; few medium roots, common fine and coarse iron manganese concretions; moderately acid (pH 5.8); clear smooth boundary.
Bw2	38-65 cm	Dark grey (10YR 4/1 M) silty clay loam; moderate medium subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common, coarse pores; few fine roots; many fine, iron, manganese concretions; moderately acid (pH 5.9); gradual smooth boundary.
Bw3	65-95 cm	Light yellowish brown (10YR 6/4 M) silty clay loam; many medium distinct dark grey (10YR 4/1) mottles; massive structure; friable when moist, slightly sticky and slightly plastic when wet; moderately acid (pH 5.9).

Range in characteristics : The soils are very deep. The A horizon is 15 to 20 cm thick. The colour is in the hue 10YR, value 4 to 5, chroma 1 to 2. The texture is clay loam or silty clay loam. The structure is moderate medium or fine subangular blocks. The B horizon is 75 to 100 cm thick and has two or more subhorizons. The colour is in the hue 10YR, value 4 to 6, chroma 1 to

4. Low chroma mottles are observed whenever the matrix colour is of high chroma. The texture is clay loam or silty clay loam. The structure is moderate medium subangular blocky in the upper part and massive in the lower part of B horizon. The surface horizon is strongly acid whereas the subsurface horizons are moderately acid. Fe-Mn concretions are common in the B horizons.

Competing series : No competing series is identified.

Interpretation : Strongly acid in the surface with low available potassium content

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low base saturation, low fertility
Potato, beans	Suitable	No limitation
Mustard, tomato, wheat, cowpea	Moderately suitable	Low pH, low base saturation, low fertility
Cabbage, pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	18.5	46.5	35.0			
20-38	23.8	36.7	39.5			
38-65	19.0	45.5	35.5			
65-95	19.5	46.7	33.8			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	1.42	-	5.5	-
20-38	0.98	-	5.8	-
38-65	0.87	-	5.9	-
65-95	0.26	-	5.9	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	2.82	0.37	0.11	1.80	1.60	10.5	49	0.30
20-38	3.79	0.38	0.13	1.50	1.30	11.9	61	0.30
38-65	3.69	0.50	0.16	1.40	1.20	11.0	62	0.31
65-95	3.40	0.55	0.18	1.30	1.10	10.8	63	0.32

10. NALBARI SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquepts.*
Type location	:	26°16'39" N Latitude, 91°19'35" E Longitude; Village Mukatmua, district Nalbari, Assam
Profile No.	:	78 N / P-46
Physiographic position	:	Very gently sloping alluvial low land
Elevation (m)	:	30-50 m above MSL.
Groundwater table	:	
Rainfall	:	2100 mm
Slope, erosion &relief	:	Very gently sloping
Drainage & permeability	:	Somewhat poor in rainy season, improves to well drained in post rainy period and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, potato, wheat, tomato mustard,
Geology and parent material	:	Sedimentary
Distributation and extent	:	Extensive in Nalbari district (26,595 ha)
Soil series correlated	:	Correlated with Bharali series of Sonitpur district
Soil series associated	:	Maroa and Tihu

Typifying pedon : Nalbari clay loam – cultivated.

Ap	0-15 cm	Greyish brown (10YR 5/2 M) clay loam; many fine distinct yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; many medium roots; slightly acid (pH 6.4); gradual smooth boundary.
Bw1	15-59 cm	Dark greyish brown (10YR 4/2 M) clay loam; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; few medium roots; slightly acid (pH 6.3); gradual smooth boundary.
Bw2	59-92 cm	Greyish brown (10YR 5/2 M) clay loam; massive structure; hard when dry, firm when moist, moderately sticky and slightly plastic when wet; slightly acid (pH 6.5); gradual smooth boundary.
C	92-175 cm	Brown (10YR 5/3 M) silty clay loam; massive structure; slightly hard when dry, firm when moist, moderately sticky and slightly plastic; slightly acid (pH 6.3).

Range in characteristics : Nalbari soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 5, chroma 1 to 2. The texture is clay loam or loam. The structure is moderate medium or fine subangular blocks. The B horizon is 70 to 90 cm thick and has two or more sub horizons differing in texture and colour. The colour is in the hue 10YR, value 4 to 6, chroma 1 to 2. The texture is clay loam or silty clay loam. The structure is moderate medium subangular blocks in the upper part whereas it is massive due to saturation in the lower part of B horizon. The C horizon generally occurs below 100 cm depth. It is brown in colour and

silty clay loam or clay loam in texture. Structural development is not observed. The roots are distributed up to a depth of 60 cm. The A and B horizons have high chroma mottles in the hues, 7.5YR and 5YR.

Competing series : The Bharali soil series identified in Sonitpur district is competing series. Bharali soils have 16 to 35 percent clay in upper 50 cm and 16 percent below, in the control section. Bharali soils have colours in hue 5YR below the depth of 40 to 50 cm.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Mustard, cabbage, potato, wheat, pea, beans, cowpea	Suitable	No limitation
Tomato	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	29.4	40.5	30.1			
15-59	24.7	42.0	33.3			
59-92	30.8	38.9	30.3			
92-175	19.5	52.0	28.5			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.2	-	6.4	-
15-59	0.98	-	6.3	-
59-92	0.81	-	6.5	-
92-175	0.78	-	6.3	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-15	3.81	0.42	0.10	0.60	0.10	8.9	86	0.29
15-59	5.14	0.33	0.11	0.80	0.50	10.8	81	0.32
59-92	3.98	0.48	0.11	0.50	0.08	8.8	88	0.29
92-175	3.78	0.40	0.12	0.80	0.50	8.1	77	0.28

11. TIHU SERIES

Classification	:	Fine silty, mixed, hyperthermic family of *Aquic Eutrudepts*
Type location	:	26°26'23" N Latitude, 91°14'23" E Longitude; Village Lakhipur, Tehsil Tihu, district Nalbari, Assam.
Profile No.	:	78 N / P-26
Physiographic position	:	Gently sloping (1-3%)alluvial plains
Elevation (m)	:	30-50 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2100 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), very slight erosion
Drainage & permeability	:	Moderately well drained and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, potato, wheat, tomato mustard, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nalbari district (2,066 ha)
Soil series associated	:	Nalbari and Maroa

Typifying pedon : Tihu silty clay loam - cultivated

Ap	0-11 cm	Greyish brown (10YR 5/2 M) silty clay loam; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; many very fine to fine pores; many, fine to medium roots; slightly acid (pH 6.5); clear smooth boundary.
Bw1	11-26 cm	Yellowish brown (10YR 5/4 M) silty clay loam; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common fine to medium pores; many, medium roots; slightly acid (pH 6.3); clear smooth boundary.
Bw2	26-61 cm	Light olive brown (2.5Y 5/4 M) silty clay loam; moderate medium subangular blocky structure; slightly hard when dry, friable when moist, moderately sticky and moderately plastic when wet; fine, few roots, few, fine, faint grey mottles (10YR 5/1); few, fine iron-manganese concretions; slightly acid (pH 6.4); clear smooth boundary.
Bw3	61-79 cm	Dark brown (10YR 4/3 M) silty clay loam; massive structure; slightly hard when dry, firm when moist, moderately sticky and moderately plastic when wet; many, fine, faint grey mottles (10YR 5/1); slightly acid (pH 6.4); clear smooth boundary.
Bw4	79-96 cm	Yellowish brown (10YR 5/4 M) silty clay loam; massive structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; slightly acid (pH 6.2).

Range in characteristics : Tihu soils are very deep. The A horizon is 10 to 20 cm thick. The colour is in the hue 10YR, value 4 to 6, chroma 1 to 2. The texture is silty clay loam or clay loam. The structure is moderate medium, fine subangular blocks. The B horizon is 70 to 90 cm thick and has two or more subhorizons differing in colour of matrix, presence of redox depletion and concretions. The colour is in the hue 10YR or 2.5Y, value 4 to 5, chroma 3 to 4. It has many grey (chroma, 1) mottles. The texture is dominantly silty clay loam or clay loam. The structure is moderate medium subangular blocky in the upper part and massive in the lower B horizons. These soils are slightly acid. Roots are distributed up to 60 cm depth.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Cabbage, potato, wheat	Suitable	No limitation
Mustard, tomato, beans, pea, cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-11	18.0	47.2	34.8			
11-26	18.5	48.1	33.4			
26-61	19.0	49.5	31.5			
61-79	19.8	50.2	30.0			
79-96	19.6	46.5	33.9			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-11	1.10	-	6.5	-
11-26	0.93	-	6.3	-
26-61	0.89	-	6.4	-
61-79	0.85	-	6.4	-
79-96	0.76	-	6.2	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-11	4.41	0.62	0.10	0.50	0.08	10.9	89	0.31
11-26	4.00	0.75	0.11	0.80	0.50	9.6	78	0.29
26-61	3.91	0.69	0.10	0.60	0.10	9.2	87	0.29
61-79	3.80	0.66	0.14	0.60	0.10	9.0	87	0.30
79-96	4.37	0.61	0.12	1.00	0.80	10.0	74	0.29

12. BARPETA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Endoaquepts*
Type location	:	26°32'24" N Latitude, 91°15'23" E Longitude; Village Bilpar, district Barpeta, Assam
Profile No.	:	78 N / P-80
Physiographic position	:	Very gently sloping alluvial plains
Elevation (m)	:	30-50 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2100 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), none to very slight erosion
Drainage & permeability	:	Very poorly drained and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, potato, tomato mustard, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Barpeta (15,496 ha) and Bongaigaon (27,892 ha) districts
Soil series associated	:	Goraimara and Howli

Typifying pedon : Barpeta clay loam - cultivated

Ap	0-14 cm	Grey (10YR 6/1 M) clay loam; moderate medium subangular blocky structure; moist friable, wet sticky and slightly plastic; common fine roots; neutral (pH 6.8); gradual smooth boundary.
Bwg1	14-45 cm	Grey (10YR 5/1 M) clay loam; moderate medium subangular blocky structure; moist friable, wet sticky and slightly plastic; few, dark brown (7.5YR 3/2) mottles; few fine roots; few fine Fe-Mn concretions; neutral (pH 6.7); gradual smooth boundary.
Bwg2	45-70 cm	Light brownish grey (10YR 6/2 M) clay loam, moderate medium subangular blocky structure; moist friable, wet sticky and plastic; few dark brown (7.5YR 4/2) mottles; few, fine roots; few fine, Fe-Mn concretions; neutral (pH 6.8); gradual smooth boundary.
Bwg3	70-105 cm	Greyish brown (10YR 5/2 M) loam; moderate medium subangular blocky structure; moist friable, wet slightly sticky and slightly plastic; few yellowish brown (10YR 5/6) mottles; few, fine Fe-Mn concretions; neutral (pH 7.0); gradual smooth boundary.
Cg	105-150 cm	Light olive brown (2.5Y 5/4 M) loam; massive; moist friable, wet sticky and non-plastic; many medium distinct dark grey (10YR 4/1) mottles; few yellowish brown (10YR 5/6) mottles; neutral (pH 6.8).

Range in characteristics : These soils are very deep. The A horizon is 14 to 23 cm thick. The colour is in the hue of 10YR or 2.5Y, value 3 to 6, chroma 2 to 1. The texture is clay loam or loam. The structure is moderate medium or fine subangular blocky. The B horizon is 70 to 90 cm thick. The colour is in the hue 10YR, value 4 to 6, chroma 2 to 1. The B horizons have few dark

brown or yellowish brown mottles. They have moderate medium peds of subangular blocks. The C horizon is noticed generally below 100 cm depth. Its colour is in the hue of 10YR or 2.5Y, value 4 to 6, chroma 0 to 4. Structural development is not noticed in the C horizon. Fe-Mn concretions are found throughout the pedon.

Competing series : The Darrang soil series identified in Darrang district is competing series. The Darrang soils have sand content of 44 to 55 percent. The pH ranges between 5.7 and 6.7 and base saturation percent of 54 to 56.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Wheat, cabbage, tomato, potato, beans, pea, cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	36.0	33.0	31.0			-
14-45	37.0	31.2	31.8			-
45-70	26.0	41.0	33.0			-
70-105	25.0	50.0	25.0			-
105-150	39.0	43.0	18.0			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	0.83	-	6.8	-
14-45	0.79	-	6.7	-
45-70	0.61	-	6.8	-
70-105	0.56	-	7.0	-
105-150	0.29	-	6.8	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-14	5.44	0.36	0.13	0.80	0.40	9.02	83	0.29
14-45	5.86	0.42	0.23	0.80	0.40	9.53	84	0.29
45-70	6.35	0.46	0.14	0.80	0.40	9.08	85	0.28
70-105	5.48	0.30	0.13	0.40	0.40	8.28	88	0.33
105-150	4.79	0.21	0.14	0.80	0.40	6.98	81	0.38

13. GORAIMARA SERIES

Classification	:	Coarse loamy, mixed, hyperthermic *Typic Fluvaquents.*
Type location	:	26°22'0" N Latitude, 90°58'0" E Longitude; Village Satrakamara, 7 km from Mondiya, district Barpeta, Assam.
Profile No.	:	78 J / GP 44 / R2
Physiographic position	:	Very gently sloping alluvial plains
Elevation (m)	:	20-40 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2100 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), very slight erosion
Drainage & permeability	:	Somewhat poorly drained and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, mustard
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sonitpur (62,160 ha), Darrang (24,715 ha) and Barpeta (20,888 ha) districts
Soil series associated	:	Barpeta and Howli

Typifying pedon : Goraimara sandy clay loam - cultivated

Ap	0-21cm	Greyish brown (2.5Y 5/2 M) sandy clay loam; moderate medium subangular blocky; hard when dry, moist friable, wet slightly sticky and slightly plastic; few medium roots; slightly acid (pH 6.4); gradual smooth boundary.
A2	21-31 cm	Light brownish grey (10YR 6/2 M) loam; moderate medium subangular blocky; slightly hard when dry, moist friable, wet slightly sticky and slightly plastic; few fine roots, neutral (pH 6.6); clear wavy boundary.
Cg1	31-37 cm	Light grey (10YR 7/1 M) loamy sand; single grain structure; loose when dry, moist very friable, wet non sticky and non plastic; few fine roots; slightly acid (pH 6.5); clear smooth boundary.
Cg2	37-67 cm	Black (5Y 2.5/2 M) loam; massive; moist friable, slightly sticky and non plastic; few fine roots; few fine Fe-Mn concretions; slightly acid (pH 6.5); gradual smooth boundary.
Cg3	67-80 cm	Light grey (10YR 7/1 M) sandy loam; single grain structure; moist very friable, wet non-sticky and non-plastic; neutral (pH 7.0); gradual wavy boundary.
Cg4	80-110 cm	Dark greyish brown (10YR 4/2 M) loamy sand; single grain structure; moist very friable, wet non sticky and non plastic; few fine Fe-Mn concretions; neutral (pH 7.0).

Range in characteristics : The soils are very deep. The A horizon is 25 to 35 cm thick. The colour is in the hue 2.5YR or 10YR, value 4 to 6, chroma 1 to 2. The texture is sandy clay loam, loam or clay loam. The structure is moderate medium or fine subangular blocks. The A horizons commonly have constrasting textures with C horizons. The C horizon begins below a depth of 25 to 35 cm and extends up to 100 cm or the depth studied. The C horizons are generally gleyed. It has constrasting colours and textures reflecting the nature of sediment stratification. The colour is in the hue 10YR or 2.5Y or 5Y, value 4 to7, chroma 2 to 1. The texture is loamy sand, sandy loam and loam in the C horizons. Development of structure is not observed. Fe-Mn concretions are common in C horizons.

Competing series : The Dhubri soil series identified in Dhubri district is competing series. Dhubri soils have a sand content 77 to 80 percent and clay content of 10 to 14 percent with uniform distribution throughout depth. The base saturation ranges between 48 and 63 percent.

Interpretation:

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low organic matter, low fertility
Wheat, mustard, cabbage, tomato, potato, beans, pea, cowpea	Marginally suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-21	45.3	26.3	28.4			
21-31	34.7	40.8	24.5			
31-37	81.5	8.1	10.4			
37-67	47.5	34.3	18.2			
67-80	67.3	17.3	15.4			
80-110	83.7	6.3	10.0			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-21	0.59	-	6.4	-
21-31	0.48	-	6.6	-
31-37	0.29	-	6.5	-
37-67	0.31	-	6.5	-
67-80	0.20	-	7.0	-
80-110	0.18	-	7.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-21	4.10	0.11	0.08	0.70	0.60	7.79	76.7	0.27
21-31	3.49	0.20	0.06	0.60	0.50	6.49	77.3	0.26
31-37	2.56	0.09	0.04	0.70	0.60	4.88	67.4	0.47
37-67	3.01	0.11	0.05	0.70	0.60	5.66	70.9	0.31
67-80	2.78	0.13	0.02	0.20	0.70	5.27	76.5	0.34
80-110	2.60	0.04	0.01	0.20	0.70	4.90	74.6	0.49

14. HOWLI SERIES

Classification	:	Fine, mixed, hyperthermic family of *Typic Endoaquepts.*
Type location	:	26°15'41" N Latitude, 91°0'40" E Longitude; Village Borsuba Pathosala (23 km south east of Barpeta), district Barpeta, Assam.
Profile No.	:	78 N / P15
Physiographic position	:	Very gently sloping alluvial low lands
Elevation (m)	:	30-40 m above MSL.
Groundwater table	:	2-5 m
Rainfall	:	2100 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slightly eroded.
Drainage & permeability	:	Poor in rainy season improves in post rainy Period and saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, mustard, tomato, wheat
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Barpeta district (6,641 ha)
Soil series associated	:	Barpeta and Goraimara

Typifying pedon : Howli clay loam – cultivated.

Ap	0-20 cm	Pale brown (10YR 6/3 M) clay loam; moderate, medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common very fine pores; common fine roots; neutral (pH 6.9), clear smooth boundary.
Bwg1	20-47 cm	Very dark grey (7.5YR 3/0 M) clay loam; moderate, medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common medium pores; few fine roots; neutral (pH 6.7); gradual smooth boundary.
Bwg2	47-69 cm	Very dark grey (10YR 3/1 M) clay loam, moderate, medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; few fine faint strong brown (7.5YR 5/6) mottles; few fine roots; neutral (pH 6.8); gradual smooth boundary.
Bwg3	69-100 cm	Greyish brown (10YR 5/2M) sandy clay loam; moderate, medium subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; moderate medium prominent strong brown (7.5YR 5/6) mottles, neutral (pH 6.9).

Range in characteristics : The soils are very deep. The A horizon is 15 to 20cm thick. The colour is in the hue of 10YR or 2.5Y, value 4 to 6, chroma 2 to 3. The texture is clay loam or loam. The structure is moderate medium or fine subangular blocky. The B horizon is 60 to 80 cm thick and have two or more subhorizons. The colour is in the hue 7.5YR or 10YR, value 3 to 5, chroma 2 to 0. The B horizons have strong brown mottles below 50 cm. The texture is clay loam or sandy clay loam. The structure generally is moderate medium subangular blocky. Roots are distributed up to a depth of 70 cm.

Competing series : No competing series is identified.

Interpretation :
Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Wheat, mustard, cabbage, tomato, potato, peas, beans, cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	36.0	27.0	37.0			
20-47	44.0	17.0	39.0			
47-69	40.0	25.0	35.0			
69-100	49.0	18.0	33.0			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	1.03	-	6.9	-
20-47	0.96	-	6.7	-
47-69	0.78	-	6.8	-
69-100	0.18	-	6.9	-

Depth (cm)	Extractable bases			Extrac-table acidity	Extrac-table Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	4.84	0.40	0.08	1.40	0.80	9.71	71	0.27
20-47	4.93	0.43	0.08	1.50	0.80	10.90	70	0.29
47-69	4.76	0.30	0.12	1.50	1.00	10.40	67	0.29
69-100	4.50	0.30	0.12	1.20	1.00	8.89	69	0.27

15. ABHAYAPURI SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Dystrudepts*.
Type location	:	26°21'56" N Latitude, 90°36'0" E Longitude; Village North Salmara, Nackati hills, district Bongaigaon, Assam.
Profile No.	:	78 J / P2
Physiographic position	:	Gently sloping alluvial uplands around the isolated hillocks
Elevation (m)	:	40-60 m above MSL.
Groundwater table	:	2-5 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Gently sloping, slightly to moderately eroded
Drainage & permeability	:	Well drained and saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Rice, mustard, tomato, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Bongaigaon district (7,247 ha)
Soil series associated	:	Salmara

Typifying pedon: Abhayapuri sandy loam – cultivated.

Ap.	0-20 cm	Dark brown (10YR 3/3 M) sandy loam; weak fine sub- angular blocky structure; slightly hard, friable, slightly sticky and non plastic; many fine roots; few very fine iron- manganese concretions; moderately acid (pH 5.9); clear smooth boundary.
Bw1	20-42 cm	Dark yellowish brown (10YR 4/4 M) sandy loam, moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and non plastic; few very fine roots; few very fine iron- manganese concretions; moderately acid (pH 6.0); gradual smooth boundary.
Bw2	42-60 cm	Dark yellowish brown (10YR 4/4 M) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; many iron manganese concretions; slightly acid (pH 6.2); gradual smooth boundary.
Bw3	60-90 cm	Dark yellowish brown (10YR 4/6 M) sandy clay loam; massive Structure; friable, sticky and slightly plastic; few, very fine roots; many iron manganese concretions; moderately acid (pH 6.0); gradual smooth boundary.
C	90-130 cm	Dark yellowish brown (10YR 4/6 M) sandy clay loam; massive structure; friable, sticky and slightly plastic; few very fine iron-manganese concretions; slightly acid (pH 6.4).

Range in characteristics : The Abhayapuri soils are very deep. The A horizon is 15 to 25 cm thick. Its colour is in the hue 10 YR, value 3 to 4, chroma 2 to 3. The texture is sandy loam or loamy sand. The structure is weak fine subangular blocks. The B horizon is 60 to 75 cm thick and

has 2 or more subhorizons. It has colours in the hue 10YR, value 4 to 5, chroma 4 to 6. The texture is generally sandy clay loam. The structure is moderate, fine or medium subangular blocky. The C horizon is below a depth of 80 to 100 cm. Its colour is in the hue 10 YR, value 4 to 5 chroma 4 to 6. The texture is sandy clay loam. It does not have development of structure. These soils are moderately acid up to a depth of 40 cm and slightly acid thereafter. Fe-Mn concretions are observed throughout the depth. Roots are many in the surface horizon and decreases with depth. The C horizon generally does not have roots.

Competing series : No competing series is identified.

Interpretation :
Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarser texture, low water availability, low organic matter, low fertility
Cabbage, potato	Suitable	No limitation
Mustard, tomato, beans, cowpea	Moderately suitable	Coarser texture, low organic matter, low fertility
Wheat	Marginally suitable	Coarser texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	64.50	17.02	18.48			-
20-42	63.70	16.50	19.80			-
42-60	64.20	13.80	22.60			-
60-90	68.30	11.10	20.60			-
90-130	75.00	4.70	20.30			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	0.91	-	5.9	<0.05
20-42	0.86	-	6.0	<0.05
42-60	0.35	-	6.2	<0.05
60-90	0.27	-	6.0	<0.05
90-130	0.12	-	6.4	<0.05

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	2.62	0.28	0.11	3.6	2.6	6.61	32.7	0.36
20-42	3.24	0.32	0.16	3.0	1.7	6.72	44.2	0.34
42-60	3.65	0.34	0.23	2.8	1.3	7.02	50.7	0.32
60-90	3.31	0.32	0.27	3.0	1.7	6.90	45.3	0.34
90-130	4.19	0.30	0.16	2.2	1.0	6.85	59.2	0.34

16. BONGAIGAON SERIES

Classification	:	Coarse loamy, mixed, hyperthermic family of *Typic Endoaquepts*.
Type location	:	26°19'0" N Latitude, 93°30'0" E Longitude; Village Kaitpara, district Bongaigaon, Assam.
Profile No.	:	78 J / P6
Physiographic position	:	Nearly level to very gently sloping flood plains
Elevation (m)	:	20-40 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Poor in rainy season and well drained in post rainy period. Saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Rice, mustard, potato, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Bongaigaon district (26,425 ha)
Soil series associated	:	Jogighopha

Typifying pedon: Bongaigaon sandy loam – cultivated.

Ap	0-15 cm	Dark greyish brown (10YR 4/2 M) sandy loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and non plastic; few, fine roots; moderately acid (pH 5.9); diffuse smooth boundary.
Bw1	15-34 cm	Very dark greyish brown (10YR 3/2 M) sandy loam; moderate medium subangular blocky structure; friable, slightly sticky and non plastic; few, fine roots; slightly acid (pH 6.2); diffuse smooth boundary.
Bw2	34-47 cm	Dark greyish brown (10YR 4/2 M) sandy loam; moderate, medium, subangular blocky structure; friable, slightly sticky and non plastic; few, fine roots; slightly acid (pH 6.1); diffuse smooth boundary.
Bw3	47-66 cm	Light brownish grey (10YR 6/2 M) sandy loam; few, fine faint brownish yellow (10YR 6/6) mottles; massive structure; very friable, slightly sticky and non plastic; slightly acid (pH 6.3); diffuse smooth boundary.
BC	66-84 cm	Light grey to grey (10YR 6/1 M) loamy sand; few, fine, faint brownish yellow (10YR 6/6) mottles; massive structure; very friable, non sticky and non plastic; moderately acid (pH 6.0); clear smooth boundary.
C	84-155 cm	Yellowish brown (10YR 5/4 M) loamy sand; few fine faint brownish yellow (10YR 6/6) mottles; massive structure; very friable, non sticky and non plastic; slightly acid (pH 6.1).

Range in characteristics : Bongaigaon soils are very deep. The A horizon is 15 to 20 cm thick. It has colours is in the hue 10YR, value 4 to 5, chroma 1 to 2. The texture is sandy loam or loamy sand. The structure is weak, medium or fine, subangular blocks. The B horizon is 50 to 75 cm thick and has two or more subhorizons. Its colour is in the hue 10YR, value 3 to 6, chroma 1 to 2. The texture is generally sandy loam. However, loamy sand is observed in the lower part of B horizon in some locations. The C horizon is generally below a depth of 80 cm. It has colours in the hue 10YR, value 4 to 6, chroma 3 to 4. The texture is generally loamy sand, however sandy loam is also observed. High chroma (10YR 6/6) mottles are common in C horizon. C horizon does not have structural development. Bongaigaon soils are moderately acid in the surface horizon and slightly acid in subsoils.

Competing series : No competing series is identified.

Interpretation :
Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarser texture, low organic matter, low fertility
Cabbage, potato, mustard, tomato, peas, beans, cowpea	Moderately suitable	Low organic matter, low fertility
Wheat	Marginally suitable	Coarser texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	76.6	9.1	14.3			-
15-34	79.0	5.1	15.9			-
34-47	80.1	3.5	16.4			-
47-66	78.7	6.2	15.1			-
66-84	84.3	2.6	13.1			-
84-155	85.5	2.7	11.8			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.97	-	5.9	-
15-34	1.04	-	6.2	-
34-47	0.70	-	6.1	-
47-66	0.30	-	6.3	-
66-84	0.20	-	6.0	-
84-155	0.16	-	6.1	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-15	1.64	0.26	0.24	3.2	2.0	5.34	40	0.37
15-34	2.76	0.30	0.16	2.8	1.2	6.02	53	0.38
34-47	2.82	0.28	0.20	3.1	1.2	6.40	52	0.39
47-66	2.51	0.26	0.22	2.8	1.0	5.79	52	0.38
66-84	1.66	0.36	0.20	3.0	1.2	5.22	43	0.39
84-155	1.46	0.22	0.45	2.9	1.2	5.03	42	0.43

17. JOGIGHOPA SERIES

Classification	:	Mixed, hyperthermic family of *Typic Psammaquents.*
Type location	:	26°28'24" N Latitude, 90°30'29" E Longitude; Village Dhantola, district Bongaigaon, Assam
Profile No.	:	78 J / GP49
Physiographic position	:	Very gently sloping active flood plains
Elevation (m)	:	30-50 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Poor in rainy season improves to well drained in post rainy period and the saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Rice, jute, tomato,mustard, potato, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Bongaigaon district (8,617 ha)
Soil series associated	:	Bongaigaon

Typifying pedon : Jogighopa sandy loam – cultivated.

Ap	0-18 cm	Greyish brown (10YR 5/2 M) sandy loam; weak, fine, subangular blocky structure; soft, friable, slightly sticky and non plastic; common fine roots; moderately acid (pH 5.8); clear smooth boundary.
C1	18-43 cm	Light brownish grey (10YR 6/2 M) sandy loam; single grain structure; soft, friable, non sticky and non plastic; few fine roots; moderately acid (pH 6.0); gradual smooth boundary.
C2	43-98 cm	Light brownish grey (10YR 6/2 M) loamy sand; single grain structure; soft, very friable, non sticky and non plastic; slightly acid (pH 6.1); gradual smooth boundary.
C3	98-139 cm	Light yellowish brown (10YR 6/4) loamy sand; few fine faint dark yellowish brown (10YR 4/4) mottles; single grain structure; soft, very friable, non sticky and non plastic; slightly acid (pH 6.2); clear smooth boundary.

Range in characteristics : The Jogighopa soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10 YR, value 4 to 6 and chroma 1 to 3. The texture is sandy loam or loamy sand. The structure is weak, fine, subangular blocks. The C horizon generally occurs below the depth of 20 cm and has 3 or more subhorizons. Its colour is in the hue 10 YR, value 5 to 6 chroma and 2 to 4. High chroma (4 to 6) mottles are observed in the lower parts of C horizon (below 100 cm). The texture is generally loamy sand, however a thin horizon of sandy loam is observed immediately below the Ap horizons in some locations. The structure is single grain. These soils are moderately acid in the surface upto a depth of 20 cm and occasionally up to 40 cm. They are slightly acid below the depth of 40 to 50 cm. The roots are common in the surface and decreases in the lower horizons.

Competing series : The Dhansiri series identified in Darrang district is competing series. Dhansiri soils have colours with chroma 1 or less. They have pH between 6.1 and 6.8.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarser texture, low organic matter, low fertility
Cabbage, potato	Suitable	No limitations
Mustard, tomato, beans, peas, cowpea	Moderately suitable	Coarser texture, low organic matter, low fertility
Wheat	Marginally suitable	Coarser texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-18	79.20	8.00	12.80			-
18-43	80.00	9.00	11.00			-
43-98	86.00	4.15	9.85			-
98-139	86.75	3.55	9.70			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-18	0.99	-	5.8	-
18-43	0.39	-	6.0	-
43-98	0.16	-	6.1	-
98-139	0.46	-	6.2	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-18	2.60	0.30	0.28	3.0	2.0	6.16	52	0.48
18-43	2.49	0.26	0.18	2.5	1.4	5.43	54	0.49
43-98	1.75	0.26	0.16	2.2	1.4	4.37	50	0.44
98-139	1.68	0.21	0.19	2.2	1.0	4.28	49	0.44

18. DHUBRI SERIES

Classification	:	Coarse loamy, mixed, hyperthermic family of *Typic Fluvaquents*.
Type location	:	26°00'30" N latitude, 90°00'00" E longitude, Village Srigram, district Dhubri, Assam.
Profile No.	:	78J / P-4
Physiographic position	:	Undulating lowlands
Elevation (m)	:	20-40 m above MSL.
Groundwater table	:	5-10 m
Rainfall	:	2025 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), Slight erosion
Drainage & permeability	:	Poor in rainy season improves to well drained in post rainy period and the saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Rice, jute, tomato,mustard, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dhubri district (19,861 ha)
Soil series associated	:	Golakganj

Typifying pedon : Dhubri sandy loam - cultivated.

Ap	0-16 cm	Dark grey (10YR 4/1 M) sandy loam ; few fine faint dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and non plastic; many, fine and very fine roots; neutral (pH 6.7); diffuse smooth boundary.
Cg1	16-54 cm	Grey (10YR 5/1 M) sandy loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and non plastic; few, fine roots; neutral (pH 6.7); diffuse smooth boundary.
Cg2	54-75 cm	Light grey to grey (10YR 6/1 M) sandy loam; weak medium subangular blocky structure; slightly hard, very friable, non sticky and non plastic; few fine roots; slightly acid (pH 6.4); diffuse smooth boundry.
Cg3	75-150 cm	Light grey to grey (10YR 6/1 M) loamy sand; single grain Structure; loose, very friable, non sticky and non plastic, slightly acid (pH 6.5).

Range in characteristics : The Dhubri soils are very deep. The A horizon is 15 to 20 cm thick. Its has colour in hue 10YR, value 4 to 5, chroma 1 to 2. The texture is sandy loam or loamy sand. The structure is weak, fine or medium subangular blocks. The C horizon begins below the depth of 15 to 20 cm and has 3 or more sub horizons. Its colour is in hue 10YR, value 5 to 6, chroma 1 to 2. The texture is sandy loam or loamy sand. The structure is very weakly developed or single grain. The root distribution is concentrated in surface horizon, hence many yellowish brown root mottles. The organic carbon content is irregular through the depth. The soil reaction is neutral or slightly acid.

Competing series : The Goraimara soil series identified in Barpeta district is a competing series. Goraimara soils have irregular distribution of sand, silt and clay with depth. The minimum sand percentage is 35 and maximum is 84 percent. Clay percentage ranges between 10 and 25 percent

in the particle size control section. The clay percent in surface horizon is higher (28 percent) in many locations. The base saturation is above 67 percent.

Intepretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture
Wheat	Marginally suitable	Coarse texture, low water availability
Mustard, cabbage, tomato, potato, beans, peas, cowpea	Moderately suitable	Coarse texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	77.0	10.0	13.0	-	-	7
16-54	77.3	8.3	14.4	-	-	10
54-75	78.0	8.0	14.0	-	-	12
75-150	80.0	10.0	10.0	-	-	10

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	1.56	-	6.7	-
16-54	2.06	-	6.7	-
54-75	0.76	-	6.4	-
75-150	0.63	-	6.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-16	2.05	0.19	0.11	1.6	0.9	4.65	48.4	0.39
16-54	3.44	0.29	0.09	1.6	0.6	5.90	63.4	0.41
54-75	2.90	0.15	0.11	1.6	0.9	5.56	55.8	0.39
75-150	2.22	0.19	0.11	1.6	0.5	4.62	54.5	0.46

19. GOLAKGANJ SERIES

Classification	:	Fine, mixed, hyperthermic family of *Fluvaquentic Endoaquepts.*
Type location	:	26°61'24" N latitude, 89°49'30" E longitude, Village Golakganj, district Dhubri, Assam.
Profile No.	:	78 F / P-18
Physiographic position	:	Nearly level or very gently sloping floodplains
Elevation (m)	:	30-40 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2025 mm
Slope, erosion &relief	:	Nearly level or very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Poorly drained in rainy season improves to well drained in post rainy period and the saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, jute, tomato,mustard, cabbage
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dhubri district (13,363 ha)
Soil series associated	:	Dhubri

Typifying pedon : Golakganj clay loam – cultivated.

Ap	0-13 cm	Grey (10YR 5/1 M) clay loam; weak medium subangular blocky structure; firm, sticky and plastic; common, fine roots; moderately acid (pH 6.0); clear smooth boundary.
Bwg1	13-26 cm	Dark grey (10YR 4/1 M) clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; slightly acid (pH 6.2); clear smooth boundary.
Bwg2	26-47 cm	Very dark grey (10YR 3/1 M) clay loam; moderate medium subangular blocky structure; firm sticky and plastic; few fine roots; slightly acid (pH 6.4); diffuse smooth boundary.
Bwg3	47-100 cm	Dark grey (10YR 4/1 M) clay; few, fine, faint, light yellowish brown (10YR 6/4) mottles; massive structure; firm, very sticky and plastic; slightly acid (pH 6.1).

Range in characteristics : Golakganj soils are very deep. The A horizon is 12 to 18 cm thick. Its colours is in the hue 10YR, value 4 to 6 and chroma 1 to 2. The texture is clay loam or silty clay loam. The structure is weak or moderate, medium, subangular blocks. The B horizon is 70 to 90 cm thick and has two or more subhorizons. It has colours in the hue 10YR, value 3 to 4, chroma 1 to 2. The texture is clay loam or clay. The structure is moderate, medium or coarse, subangular blocks. High chroma mottles (10YR 6/4) are observed in the lower B horizons. Roots are common in the surface and decreases with depth. The C horizon is observed below the depth of generally 100 cm.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Wheat	Suitable	No limitation
Mustard, cabbage, tomato, potato, beans, peas,cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	31.50	36.0	32.50			
13-26	34.90	29.70	35.40			
26-47	34.60	29.40	36.00			
47-100	37.80	20.70	41.50			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	1.19	-	6.0	-
13-26	0.90	-	6.2	-
26-47	0.76	-	6.4	-
47-100	0.80	-	6.1	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-13	3.41	0.36	0.16	2.10	0.60	6.63	59.3	0.20
13-26	4.16	0.46	0.17	2.00	0.40	7.19	66.6	0.20
26-47	5.01	0.49	0.20	1.50	0.40	7.60	75.0	0.21
47-100	5.38	0.32	0.11	2.00	0.40	8.21	70.8	0.20

20. SALMARA SERIES

Classification	:	Fine loamy mixed, hyperthermic family of *Fluventic Dystrudepts*.
Type location	:	26°15'00" N latitude, 90°18'49" E longitude, Village Sivakata, district Dhubri, Assam.
Profile No.	:	78 J / P-10
Physiographic position	:	Gently to moderately sloping alluvial uplands
Elevation (m)	:	20-30 m above MSL.
Groundwater table	:	2-5 m
Rainfall	:	2525 mm
Slope, erosion &relief	:	Gently to moderately sloping (3-8% slope), slight to moderate erosion
Drainage & permeability	:	Well drained and the saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Used for Sal forest
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dhubri district (9,006 ha)
Soil series associated	:	Abhayapuri

Typifying pedon : Salmara sandy loam - forest.

A	0-30 cm	Yellowish brown (10YR 5/6 M) sandy loam; weak medium subangular blocky structure; loose, friable non-sticky and non-plastic; many, coarse and fine roots; slightly acid (pH 6.1), clear smooth boundary.
Bw1	30-67 cm	Yellowish brown (10YR 5/8 M) sandy clay loam; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; slightly acid (pH 6.1); gradual smooth boundary.
Bw2	67-95 cm	Reddish yellow (7.5YR 6/8 M) sandy clay loam; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; slightly acid (pH 6.2); gradual smooth boundary.
BC	95-194 cm	Reddish yellow (7.5YR 6/8 M) sandy loam; moderate medium subangular blocky structure; loose, friable, slightly sticky and non plastic; few fine roots; slightly acid (pH 6.4).

Range in characteristics : Salmara soils are very deep. The A horizon is 20 to 30 cm thick. Its colour is in the hue 10YR, value 4 to 6, chroma 4 to 6. The texture is sandy loam or loam. The stucture is weak or moderate, medium or fine, subangular blocks. The B horizon is 70 to 100 cm thick and has two or more subhorizons. The colour is in the hue 10YR or 7.5YR, value 5 to 6, chroma 6 to 8. The texture is sandy clay loam in the upper part and sandy loam in the lower parts of B horizon. The structure is moderate medium or coarse subangular blocks. The B horizon is underlain by BC or C horizon below the depth of 90 cm. Its colour is in 7.5YR or 10YR, value 5 to 6, chroma 6 to 8. The texture is sandy loam or sandy clay loam. The structure is moderate,

medium, subangular blocks in the case of BC horizon and massive in the case of C horizon. The soils are slightly acid throughout the pedon.

Competing series : No competing series is identified

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarser texture
Cabbage, tomato, potato	Suitable	No limitations
Mustard, beans, peas, cowpea	Moderately suitable	Coarser texture, low water availability
Wheat	Marginally suitable	Coarser texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-30	66.00	18.00	16.00			-
30-67	64.25	12.50	23.25			-
67-95	63.00	14.00	23.00			-
95-194	77.25	8.70	14.05			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-30	2.08	-	6.1	-
30-67	1.64	-	6.1	-
67-95	1.72	-	6.2	-
95-194	1.56	-	6.4	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-30	2.12	0.26	0.06	2.20	0.80	5.44	44.8	0.34
30-67	2.23	0.30	0.08	2.50	0.80	5.91	44.2	0.25
67-95	2.95	0.31	0.14	2.20	0.80	6.40	53.1	0.28
95-194	2.79	0.30	0.11	1.70	0.70	5.60	57.1	0.39

21.TINSUKIA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Humic Dystrudepts*.
Type location	:	27°29'19" N Latitude, 95°21'45" E Longitude; Village Tinsukia, district Tinsukia, Assam.
Profile No.	:	83 M / 3RM
Physiographic position	:	Alluvial uplands
Elevation (m)	:	140-150 m above MSL.
Groundwater table	:	2-5 m
Rainfall	:	2820 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Well drained and the saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Tea garden, cabbage tomato, mustard
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Tinsukia (70,762 ha) and Dibrugarh (75,483 ha) districts
Soil series associated	:	Dibrugarh

Typifying pedon : Tinsukia loam - cultivated

Ap	0-18 cm	Very dark greyish brown (10YR 3/2 M) loam; weak medium subangular blocky structure; friable, slightly sticky and non plastic; many fine and very fine roots; very strongly acid (pH 4.9); clear smooth boundary.
Bw1	18-38 cm	Dark yellowish brown (10YR 4/4 M) loam; common medium faint dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable slightly sticky and nonplastic; common fine and very fine roots; very strongly acid (pH 4.9); gradual smooth boundary.
Bw2	38-64 cm	Brown (10YR 5/3 M) sandy clay loam; common medium faint yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky and non plastic; few very fine roots; very strongly acid (pH 4.9); gradual smooth boundary.
Bw3	64-93 cm	Yellowish brown (10YR 5/6 M) sandy clay loam; common medium distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; friable non sticky and non plastic; few very fine roots; strongly acid (pH 5.1); gradual smooth boundary.
C	93-140 cm	Yellowish brown (10YR 5/4 M) sandy loam; common fine distinct dark brown (7.5YR 3/4) and common medium distinct strong brown (7.5YR 4/6) mottles; single grain structure; very friable, non sticky and non plastic; strongly acid (pH 5.4).

Range in characteristics : Tinsukia soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 3, chroma 1 to 2. The texture is loam or sandy clay loam. The

structure is moderate or weak, medium, subangular blocks. The B horizon is 70 to 100 cm thick and has two or more sub-horizons. Its colour is in the hue 10YR, value 4 to 6, chroma 3 to 6. The texture is loam or sandy clay loam. The structure is moderate or strong, medium subangular blocks. B horizons have yellowish brown or strong brown redox concentrations with high chroma (6 to8). The C horizon is below the depth of 85 to120 cm. Its colour is in the hue 10YR, value 5 to 6, chroma 4 to 6. Structural development is not observed in the C horizons. These soils are very strongly acid in the upper part of the pedon and strongly acid in the lower part.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Tea	Suitable	No limitation
Mustard, potato	Marginally suitable	Low pH, low fertility
Wheat, cabbage, tomato, beans, cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-18	44.0	30.0	26.0	6.0	38.0	-
18-38	48.1	28.9	23.0	8.1	40.0	-
38-64	51.0	24.5	24.5	9.3	41.7	-
64-93	54.9	24.6	20.5	9.0	45.9	-
93-140	79.2	5.8	15.0	4.1	75.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O) (dSm^{-1})
0-18	2.23	-	4.9	-
18-38	0.88	-	4.9	-
38-64	0.63	-	4.9	-
64-93	0.34	-	5.1	-
93-140	0.19	-	5.4	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-18	0.77	0.43	0.07			9.22	13.77	0.35
18-38	0.58	0.48	0.04			7.68	14.32	0.33
38-64	0.58	0.52	0.03			6.91	16.35	0.28
64-93	0.77	0.42	0.03			6.91	17.65	0.34
93-140	0.96	0.39	0.02			4.61	29.72	0.31

22. DIBRUGARH SERIES

Classification	:	Fine, mixed, hyperthermic family of *Fluventic Dystrudepts*.
Type location	:	27°21'49" N Latitude, 95°51'45" E Longitude; Village Kariapani, district Dibrugarh, Assam.
Profile No.	:	83 M / S4 / M1
Physiographic position	:	Alluvial uplands
Elevation (m)	:	120-130 m above MSL.
Groundwater table	:	2-5 m
Rainfall	:	2820 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), moderate erosion
Drainage & permeability	:	Well drained and the saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Tea, cabbage tomato, mustard, potato, pea
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dibrugarh district (22,775 ha)
Soil series associated	:	Tinsukia

Typifying pedon : Dibrugarh clay loam - cultivated

Ap	0-13 cm	Brown to dark brown (10YR 4/3 M) clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; few coarse, common medium, common fine pores; few coarse, common medium and many very fine roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bw1	13-31 cm	Dark yellowish brown (10YR 4/6 M) clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; many fine and few medium pores; common fine and few medium roots; very strongly acid (pH 4.8); gradual smooth boundary.
Bw2	31-70 cm	Yellowish brown (10YR 5/6 M) clay loam; strong medium subangular blocky structure, firm sticky and plastic; many, fine and few, medium pores; common, very fine and fine roots; very strongly acid (pH 4.9); gradual smooth boundary.
Bw3	70-122 cm	Yellowish brown (10YR 5/6 M) clay; strong medium subangular blocky structure; firm sticky and plastic; many fine pores; very strongly acid (pH 4.7); gradual smooth boundary.
C	122-175 cm	Yellowish brown (10YR 5/6 M) clay loam; weak medium subangular blocky structure; friable, sticky and slightly plastic; many fine pores; very strongly acid (pH 5.0).

Range in characteristics : Dibrugarh soils are very deep. The A horizon is 12 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 5, and chroma 3 to 4. The texture is clay loam or silty clay loam. The structure is moderate, medium or fine, subangular blocks. The A horizon has coarse, medium and fine roots. The B horizon is 60 to 70 cm thick and has 2 or more subhorizons. Its colour is in the hue 10YR, value 4 to 6, chroma 4 to 6. The texture is clay loam or clay. The

structure is moderate or strong, medium or coarse, subangular blocks. B horizon has medium and fine roots. The C horizon is generally below a depth of 90 cm. Its colour is in the hue 10YR, value 5 to 6, chroma 4 to 6. The structure is weak medium subangular blocks or massive. The soils are very strongly acid in all the horizons up to a depth 150 cm or more.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Tea	Moderately suitable	Low organic matter, low fertility
Mustard, potato	Marginally suitable	Low pH, low fertility
Wheat, cabbage, tomato, beans, pea cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	25.2	45.3	29.5	13.6	11.6	-
13-31	21.8	43.7	34.5	11.1	10.7	-
31-70	20.7	45.3	34.0	11.5	9.2	-
70-122	26.2	29.3	44.5	13.7	12.5	-
122-175	20.9	50.1	29.0	11.8	9.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	1.50	-	5.0	-
13-31	0.82	-	4.8	-
31-70	0.66	-	4.9	-
70-122	0.57	-	4.7	-
122-175	0.32	-	5.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$mol(p^{+})kg^{-1}$							
0-13	2.47	1.0	0.16	0.93	0.82	9.57	67.0	0.32
13-31	1.52	0.65	0.11	0.64	2.58	7.55	41.5	0.22
31-70	1.33	0.52	0.17	0.58	2.18	8.98	42.3	0.26
70-122	1.14	0.48	0.18	0.67	2.18	9.79	38.7	0.22
122-175	1.52	0.78	0.18	0.64	2.58	8.36	43.5	0.29

23. DIHING SERIES

Classification	:	Clayey over loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquepts*.
Type location	:	27°17'0" N Latitude, 94°47'15" E Longitude; Village Khantigaon, district Dibrugarh, Assam
Profile No.	:	83 J / S1/ 4
Physiographic position	:	lowlands of the flood plain
Elevation (m)	:	120-130 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2820 mm
Slope, erosion &relief	:	Level to very slightly sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Poorly drained and the saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, mustard, Cabbage tomato, potato,
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dibrugarh district (24,193 ha)
Soil series associated	:	Khowang

Typifying pedon : Dihing silty clay loam – cultivated.

Ap	0-15 cm	Dark greyish brown (2.5Y 4/2 M) silty clay loam; weak medium subangular blocky structure; firm sticky and plastic; many very fine and fine roots; very strongly acid (pH 4.9); clear smooth boundary.
Bwg1	15-52 cm	Olive grey (5Y 5/2 M) silty clay; few, medium, faint, very dark grey (5Y 3/1) mottles; moderate medium subangular blocky structure; firm, very sticky and very plastic; few, very fine and fine roots; slightly acid (pH 6.1); clear smooth boundary.
Bwg2	52-120 cm	Grey (5Y 5/1 M) loam; few, medium, distinct, dark brown (10YR 3/3) mottles; massive structure; friable, slightly sticky and non plastic; few, very fine roots; slightly acid (pH 6.2); clear smooth boundary.
Cg	120-150 cm	Light olive brown (2.5Y 5/4 M) silty clay; few, fine, distinct, yellowish brown (10YR 5/6) mottles; massive structure, very sticky and very plastic; neutral (pH 6.6).

Range in characteristics : Dihing soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 2.5Y or 10YR, value 4 to 5, chroma 1 to 2. The texture is silty clay loam or silt loam. The structure is weak or moderate, medium or fine, subangular blocks. The B horizon is 80 to 100 cm thick and has two or three sub horizons. Its colour is in the hue 5Y or 2.5Y, value 4 to 5, chroma 1 to 2. The structure is moderate, medium, subangular blocks. The B horizons have both low and high chroma mottles. The C horizon is below the depth of about 100 cm. Its colour is in the hue 2.5Y or 5Y, value 5 to 6, chroma 3 to 4. It has no structural development. The Ap horizon is generally very strongly acid (pH <5.0) while the B and C horizons are slightly acid to neutral (pH >6).

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low organic matter, low fertility
Mustard, potato	Marginally suitable	Low pH, low fertility
Wheat, cabbage, tomato, beans, peacowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	19.4	48.6	32.0	4.3	15.1	-
15-52	16.6	42.9	40.5	4.2	12.4	-
52-120	43.2	37.3	19.5	8.2	35.0	-
120-150	5.3	44.7	50.0	1.4	3.9	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.76	-	4.9	-
15-52	0.63	-	6.1	-
52-120	0.30	-	6.2	-
120-150	0.46	-	6.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	5.76	0.52	0.17	-	-	11.26	57.28	0.35
15-52	9.79	0.61	0.08	-	-	13.57	77.23	0.34
52-120	6.72	0.87	0.07	-	-	8.19	93.53	0.42
120-150	17.09	0.61	0.21	-	-	19.97	89.68	0.40

24. KHOWANG SERIES

Classification	:	Very fine, mixed, hyperthermic family of *Aeric Endoaquepts.*
Type location	:	27°21'50" N Latitude, 94°57'57" E Longitude; Village Kwargaon, district Dibrugarh, Assam.
Profile No.	:	83 J / S1 / 6 M
Physiographic position	:	Floodplains of Brahmaputra
Elevation (m)	:	120-130 m above MSL.
Groundwater table	:	2-5 m
Rainfall	:	2820 mm
Slope, erosion &relief	:	Level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Poorly drained and the saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice, mustard, Cabbage tomato, potato, wheat
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dibrugarh district (2,711 ha)
Soil series associated	:	Dihing

Typifying pedon : Khowang silty clay - cultivated

Ap	0-12 cm	Grey (5Y 5/1M) silty clay; massive structure; very sticky and very plastic; many very fine and fine roots; very strongly acid (pH 4.9); clear smooth boundary.
Bwg1	12-32 cm	Grey (5Y 5/1 M) clay; common, fine, prominent, dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm, very sticky and very plastic; few very fine and fine roots; slightly acid (pH 6.3); gradual smooth boundary.
Bwg2	32-65 cm	Greyish brown (2.5Y 5/2 M) clay; common, medium, distinct yellowish brown (10YR 5/8) and few, fine, faint grey (2.5Y 5/0) mottles; moderate medium subangular blocky structure; firm, very sticky and very plastic; few, very fine roots; neutral (pH 6.8); gradual smooth boundary.
BCg	65-125 cm	Yellowish brown (10YR 5/6 M) clay; common medium distinct grey (5Y 5/1) and few fine distinct yellowish red (5YR 4/6) mottles; massive structure; very sticky and very plastic; neutral (pH 6.8).

Range in characteristics : Khowang soils are very deep. The A horizon is 12 to 18 cm thick. Its colour is in the hue 5Y or 2.5Y, value 4 to 5, chroma 1 to 2. The texture is silty clay or silty clay loam. The structure is massive due to puddling. The B horizon is 50 to 60 cm thick and has two or more sub horizons. Its colour is in the hue 5Y or 2.5Y, value 4 to 5, chroma 1 to 2. The texture is clay or silty clay. The structure is moderate, medium, subangular blocks. The BC or C horizon is observed below the depth of 65 to 85 cm. The colour is yellowish brown in the hue 10YR. The texture is clay or silty clay. It has no structural development and remains massive. Khowang soils are gleyed throughout the depth of 125 cm or more. They have low chroma mottles in the hue 5Y or 2.5Y and high chroma mottles in the hue 10YR or redder.

Competing series : The Dharamtul series identified in Morigaon district is a competing series. Dharamtul soils have pH of 4.0 to 4.8 through depth and base saturation of less than 40 percent in most of the horizons.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low fertility
Mustard, potato	Marginally suitable	Low pH, low fertility
Wheat, cabbage, tomato, beans, pea, cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-12	1.2	43.8	55.0	0.3	0.9	-
12-32	1.7	39.3	59.0	0.4	1.3	-
32-65	1.7	23.8	74.5	0.3	1.4	-
65-125	0.9	18.6	80.5	0.2	0.7	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-12	2.38	-	4.9	-
12-32	0.79	-	6.3	-
32-65	0.60	-	6.8	-
65-125	0.63	-	6.8	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-12	6.91	0.41	0.20	-	-	15.62	48.14	0.28
12-32	14.98	0.70	0.10	-	-	18.43	85.62	0.31
32-65	18.05	0.70	0.15	-	-	20.48	92.28	0.27
65-125								

25. DISANG SERIES

Classification	:	Fine loamy, mixed, hyperthermic, *Dystric Eutrudepts.*
Type location	:	27°11'0" N Latitude, 94°58'50" E Longitude; Village Solmari, P.S. Moran, District Sibsagar, Assam.
Profile No.	:	83 I /16 SM 47
Physiographic position	:	Nearly level flood plain
Elevation (m)	:	120 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2504 mm
Slope, erosion &relief	:	Nearly level (0-1% slope), very slight erosion
Drainage & permeability	:	Moderately well drained and the saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Rice, mustard, Cabbage tomato, potato,
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar (3,746 ha) and Hailakandi (17,213 ha) districts
Soil series associated	:	Sibsagar

Typifying pedon : Disang loam -cultivated.

Ap	0-14 cm	Greyish brown (10YR 5/2 M) loam; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; many medium roots; very strongly acid (pH 4.7); clear smooth boundary.
Bw1	14-32 cm	Light grey (10YR 7/2 M) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and non plastic; many fine roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bw2	32-61 cm	Yellow (10YR 7/8 M) loam; moderate medium sub- angularblocky structure; firm, sticky and slightly plastic; few medium and fine roots; few fine distinct strong brown (7.5YR 5/8) mottles; extremely acid (pH 4.3); gradual smooth boundary.
Bw3	61-102 cm	Brownish yellow (10YR 6/6 M) sandy clay loam; moderatemedium sub-angular blocky structure; friable, sticky and slightly plastic; few medium and fine roots; few fine distinct yellowish red (5YR 5/8) mottles, extremely acid (pH 4.4); clear smooth boundary.
Bw4	102-139 cm	Light Yellowish brown (10YR 6/4 M) sandy clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few dark brown iron-manganese concretions; few fine distinct yellowish red (5YR 4/6) mottles, very strongly acid (pH 4.7).

Range in characteristics : Disang soils are very deep. The colour of the surface soil is in hue 10YR, value of 5 to 7 and chroma 2 to 3. The texture is loam or sandy loam. The B horizon is 100 to 120 cm thick and has 2 or more subhorizons. The colour of B horizons is in the hue 10YR, value of 5 to 7 and chroma of 2 to 8. The texture is loam or sandy clay loam. The B horizons have distinct yellowish red mottles and dark brown iron manganese concretions. The A horizon has weakly developed sub-angular blocky structure where as B horizons have well developed

moderate, medium, sub-angular blocky structure. The major root distribution is confined to a depth of 32 cm.

Competing series and their differentiae : Soils of Sildubi series identified in Jorhat district are competing. They are neutral to moderately acid and they have earthworm holes in cambic B horizons. They have gravels of 2 to 10 cm size, 15 to 25 percent by volume. The CEC is higher, ranging from 12.7 to 14.6 cmol(p^+) Kg^{-1} .

Interpretation : Disang soils are subjected to inundation for shorter periods during the rainy season. They are suitable for paddy cultivation. Rabi crops like Mustard, Pulses and Wheat are grown.

Interpretative grouping :

i) Land capability subclass IIw
ii) Irrigability subclass 2d
iii) Productivity potential Medium to high.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarser texture, low pH, low organic matter, low water availability, low fertility
Tomato, potato	Marginally suitable	Low pH, low organic matter, low fertility, low water availability
Wheat, mustard, cabbage, peas, french beans, cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	51.5	34.1	14.4	28.4	23.1	Nil
14-32	60.5	23.3	16.2	28.6	36.9	Nil
32-61	45.0	33.9	21.1	27.6	17.4	Nil
61-102	45.0	26.6	28.4	24.5	20.5	Nil
102-139	46.0	24.7	29.3	23.1	22.9	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	PH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	1.7	Nil	4.7	Nil
14-32	0.3	Nil	5.0	Nil
32-61	0.2	Nil	4.3	Nil
61-102	0.1	Nil	4.4	Nil
102-139	0.1	Nil	4.7	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+	cmol(p^+)kg^{-1}				
0-14	2.9	0.1	0.5	1.0	0.9	5.7	64	0.39
14-32	2.9	0.1	0.4	0.4	0.5	3.6	79	0.19
32-61	4.3	0.2	0.1	0.8	0.6	6.2	77	0.29
61-102	6.0	0.3	0.1	0.3	0.9	7.1	84	0.25
102-139	9.2	0.3	0.1	Tr	Tr	10.9	88	0.37

26. DOMGAON SERIES

Classification	:	Fine loamy, mixed, hyperthermic, *Fluventic Dystrudepts*
Type location	:	26°56'12" N Latitude, 94°46'48" E Longitude; Village Romagaon, P.S. and District Sibsagar, Assam.
Profile No.	:	83 J /13 CNS 1
Physiographic position	:	Floodplains
Elevation (m)	:	115 m above MSL.
Groundwater table	:	1-2 m
Rainfall	:	2504 mm
Slope, erosion &relief	:	Nearly level to very gently sloping
Drainage & permeability	:	Well drained and the saturated hydraulic conductivity is low
Landuse and vegetation	:	Mostly cultivated to paddy
Geology and parent material	:	Alluvial
Distribution and extent	:	Extensive in Sibsagar district (24,144 ha)
Soil series associated	:	Amguri

Typifying pedon : Domgaon silt loam-cultivated.

Ap	0-13 cm	Grey (10YR 6/1 M) silt loam; weak medium sub-angular blocky structure; firm, slightly sticky and slightly plastic; 0.2-5 cm wide polygonal cracks; many fine, common medium and few coarse roots; moderately acid (pH 5.6); abrupt smooth boundary.
Bw1	13-26 cm	Brown (10YR 5/3 M) clay loam; moderate, medium, sub-angular blocky structure; firm, moderately sticky and moderately plastic; common, fine and few medium roots; moderately acid (pH 5.6); clear smooth boundary.
Bw2	26-53 cm	Brownish yellow (10YR 6/6 M) clay loam; weak medium sub-angular blocky structure; firm, moderately sticky and moderately plastic; conmmon fine roots; moderately acid (pH 5.8); clear smooth boundary.
Bw3	53-140 cm	Brownish yellow (10YR 6/6 M) loam; weak fine sub-angularblocky structure; friable, slightly sticky and slightly plastic; few fine roots; many orange red nodules; moderately acid (pH 6.0).

Range in characteristics : The soils are very deep. The A horizon is 10 to 20 cm thick. Its colour is in hue of 10YR, value of 5 to 6 and chroma 1to 3. Its texture is silt loam or clay loam. The colour of B horizons is in hue of 10YR, value of 5 to 6 and chroma of 3 to 6. The texture is clay loam or loam with Fe,Mn concretion below 50 cm. Structural development is noticed in A and B horizons. The major distribution of roots is observed up to a depth of 50 cm.

Competing series and their differentiae : Bharatpur series identified in Kamrup district is competing. Bharatpur soils hve a higher sand content (48-56 percent), lower silt content (24-36 percent). The pH is also lower (4.7 to 5.0) than Domgaon soils.

Interpretation : They are prone to occasional flooding during the rainy season. They are suitable for paddy during kharif season and vegetables in post rainy season.

Interpretative grouping:

i) Land capability subclass IIIw
ii) Irrigability subclass 2d

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low organic matter
Wheat, mustard, potato, frenchbean, peas, tomato, cowpea	Moderately suitable	Coarse texture, low water availability, low organic matter, low fertility
Cabbage	Marginally suitable	Low pH, low oganic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	15.2	64.6	20.2	4.2	11.0	Nil
13-26	21.2	45.8	33.0	8.7	12.5	Nil
26-53	24.2	43.0	32.8	9.6	14.6	Nil
53-140	40.0	40.0	20.0	16.0	24.0	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	1.3	Nil	5.6	Nil
13-26	0.8	Nil	5.6	Nil
26-53	0.5	Nil	5.8	Nil
53-140	0.4	Nil	6.0	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$Cmol(p^{+})kg^{-1}$				
0-13	3.9	0.2	0.1	2.4	1.0	7.8	55	0.39
13-26	2.6	0.1	0.1	2.8	1.2	6.4	41	0.19
26-53	1.1	0.1	0.1	1.6	1.2	5.6	31	0.17
53-140	0.8	0.1	0.1	1.0	1.1	5.0	32	0.25

27. KALUGAON SERIES

Classification	:	Fine, mixed, hyperthermic, *Fluvaquentic Endoaquepts.*
Type location	:	26°55'0" N Latitude, 94°37'34" E Longitude; Village Kalugaon, P.S. and District Sibsagar, Assam.
Profile No.	:	83 J / 9 P 44
Physiographic position	:	Nearly level lowland in the Brahmaputra valley
Elevation (m)	:	100-110 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2504 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-15 slope), very slight erosion
Drainage & permeability	:	Poorly drained in the mansoon , improve in post rainy period .saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice in rainy season and mustard in winter
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar district (8,436 ha)
Soil series associated	:	Moran

Typifying pedon : Kalugaon clay - cultivated.

Ap 0-15 cm — Grey (10YR 5/1 M) clay ; moderate medium sub-angular blocky structure; firm, moderately sticky and moderately plastic; 2-5 cm wide cracks; many fine and few medium roots; strongly acid (pH 5.1); gradual smooth boundary.

Bwg1 15-35 cm — Grey (10YR 5/1 M) clay; moderate medium sub-angular blocky structure; firm, moderately sticky and moderately plastic; 0.5-1 cm wide cracks; few medium and common fine roots; rusty speck of decomposing roots; moderately acid (pH 5.6); gradual smooth boundary.

Bwg2 35-57 cm — Light grey (10YR 6/1 M) silty clay; moderate medium angular blocky structure; firm moderately sticky and moderately plastic; few fine roots; few faint yellowish brown (10YR 5/6) mottles; moderately acid (pH 5.8); gradual smooth boundary.

Bwg3 57-80 cm — Grey (10YR 5/1 M) silty clay loam; moderate medium angular blocky structure; firm, moderately sticky and moderately plastic; few 1-2 mm brown iron concretions; common medium distinct yellowish brown (10YR 5/8) mottles; strongly acid (pH 5.4); gradual smooth boundary.

Bwg4 80-125cm — Light grey (10YR 6/1M) silty clay loam; massive; moderatelysticky and moderately plastic; many brown to dark brown iron-manganese concretions; few coarse distinct, yellowish brown (10YR 5/8) mottles; moderately acid (pH 5.8).

Range in characteristics : Kalugaon soils are very deep. The A horizon is 13 to 20 cm thick. Its colour is in hue of 10YR, value of 4 to 5 and chroma 1 to 2. The texture is clay or clay loam. The B horizon is more than 100 cm thick and has 2 or more subhorizons. The colour of B horizons is in hue of 10YR, value of 5 to 6 and chroma of 1 to 2. The texture is silty clay to silty clay loam or clay. The

structure is moderate, medium, sub-angular blocky. Fe-Mn nodules are common. High chroma mottles are observed below 35 cm depth. Roots are distributed up to a depth of 60 cm.

Competing series and their differentiae : No competing series is identified.

Interpretation : Kalugaon soils are fine textured with an aquic soil moisture regime. They have problems of poor drainage. These soils are best suitable for paddy during Kharif season. Vegetable crops can be grown in the winter as the soils remain sufficiently moist.

Interpretative grouping :

i) Land capability subclass - IIIw
ii) Irrigability subclass - 2ds
iii) Productivity potential - Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Wheat, cabbage, mustard, tomato, potato, pea, cowpea, beans	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	9.7	31.5	58.8	4.5	5.2	Nil
15-35	6.7	33.0	60.3	4.3	2.4	Nil
35-57	5.3	52.0	42.7	2.6	2.7	Nil
57-80	12.6	52.0	35.4	4.0	8.6	Nil
80-125	14.5	55.0	30.5	5.0	9.5	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	2.6	Nil	5.1	Nil
15-35	0.9	Nil	5.6	Nil
35-57	0.5	Nil	5.8	Nil
57-80	0.5	Nil	5.4	Nil
80-125	0.9	Nil	5.8	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-15	8.9	0.4	0.1	3.8	3.5	20.1	47	0.34
15-35	11.1	0.5	0.2	2.3	2.2	22.8	52	0.38
35-57	13.3	0.7	0.3	0.1	0.2	18.7	76	0.44
57-80	11.5	0.6	0.3	3.2	3.0	19.8	63	0.56
80-125	9.2	0.7	0.4	0.5	0.3	14.6	70	0.48

28. MORAN SERIES

Classification	:	Fine, mixed, hyperthermic, *Dystric Eutrudepts*.
Type location	:	27°7'55" N Latitude, 94°59'30" E Longitude; Village Desoipather P.S. Moran, District Sibsagar, Assam.
Profile No.	:	83 J / 16 SM 60
Physiographic position	:	Nearly level old flood plain
Elevation (m)	:	105 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2504mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Moderately well drained with low saturated hydraulic conductivity
Landuse and vegetation	:	Cultivated to paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar district (1,760 ha)
Soil series associated	:	Nazira

Typifying pedon : Moran loam-cultivated.

Ap	0-20 cm	Light brownish grey (10YR 6/2 M) loam; weak, medium, sub-angular blocky structure; firm, and sticky; many fine and medium roots; very strongly acid (pH 4.9); abrupt smooth boundary.
Bw1	20-56 cm	Brownish yellow (10YR 6/6 M) silty clay loam; moderate Medium subangular blocky structure; firm, sticky and plastic; few very fine and fine roots; common fine to coarse hard iron-manganese concretions; common medium prominent reddish yellow (5YR 6/8) mottles; strongly acid (pH 5.5); gradual smooth boundary.
Bw2	56-89 cm	Yellowish brown (10YR 5/8) silty clay; moderate medium sub-angular blocky structure, firm, very sticky and very plastic; few fine to coarse slightly hard iron-manganese concretion; common medium prominent reddish yellow (5YR 6/8) mottles; moderately acid (pH 6.0); gradual smooth boundary.
Bw3	89-116 cm	Yellowish brown (10YR 5/4 M) silty clay; moderate mediumsub-angular blocky structure; firm, sticky and plastic; many dark brown soft iron manganese concretions; many coarse faint yellowish brown (10YR 5/8) mottles; slightly acid (pH 6.4); abrupt smooth boundary.
Bw4	116-130 cm	Brownish yellow (10YR 6/6 M) silty clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; few iron-manganese concretions; many coarse prominent yellowish red (5YR 5/8) mottles; neutral (pH 6.8).

Range in characteristics : Moran soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in hue 10YR, value 5 to 6 and chroma 2 to 4. The texture is loam or silt loam. The B horizon is 100 to 120 cm thick. Its colour is in hue 10YR, value 5 to 6 and chroma 4 to 8. The texture is clay or silty clay in the control section. High chroma mottles and iron-manganese concretions are common.

Interpretation : The soils are fine textured and situated in uplands conditions. They are moderately well drained and prone to occasional flooding during mansoon period. These soils are better suited for paddy. Plantation crops can be taken up with proper drainage channels.

Interpretative grouping :

i) Land capability subclass IIw
ii) Irrigability subclass 2sd
iii) Productivity potential High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low fertility, coarse texture
Mustard, potato, tomato, wheat, cabbage, pea, beans, cowpea	Marginally suitable	Low pH, coarse texture, low water availability, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	29.9	46.1	24.0	19.0	10.9	Nil
20-56	18.0	48.4	33.6	13.2	4.8	Nil
56-89	14.0	44.7	41.3	9.4	4.6	Nil
80-116	18.1	39.6	42.3	11.5	6.6	Nil
116-130	9.0	52.6	38.4	6.5	2.5	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	2.5	Nil	4.9	Nil
20-56	0.7	Nil	5.5	Nil
56-89	0.5	Nil	6.0	Nil
80-116	0.4	Nil	6.4	Nil
116-130	0.2	Nil	6.8	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	4.9	0.6	0.2	1.4	2.0	6.8	84	0.28
20-56	4.2	0.5	0.1	0.5	0.7	8.3	58	0.25
56-89	4.8	0.6	0.1	0.1	0.2	8.2	67	0.19
80-116	6.1	0.5	0.1	0.1	0.1	10.0	67	0.24
116-130	6.8	0.7	0.1	Trace	Trace	12.3	62	0.32

29. NAHARBARI SERIES

Classification	:	Fine, mixed, hyperthermic *Oxyaquic Dystrudepts.*
Type location	:	27°0'0" N Latitude, 94°50'30" E Longitude; Naharbari Tea Estate, P.S. Naharbari, District Sibsagar, Assam.
Profile No.	:	83 J / 13 SNAT-6
Physiographic position	:	Nearly level to gently sloping uplands
Elevation (m)	:	110-120 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	2504mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Moderately well drained with low saturated hydraulic conductivity
Landuse and vegetation	:	Used for tea plantation
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar district (29,680 ha)
Soil series associated	:	Sonari

Typifying pedon : Naharbari clay loam-cultivated

Ap	0-21 cm	Light yellowish brown (10YR 6/4 M) clay loam; moderate, medium subangular blocky structure, firm, sticky and plastic; many very fine roots; very strongly acid (pH 4.8); abrupt smooth boundary.
Bw1	21-40 cm	Brownish yellow (10YR 6/8 M) clay; moderate, medium subangular blocky structure; firm sticky and plastic; many very fine roots ; very strongly acid (pH 4.7); clear smooth boundary.
Bw2	40-96 cm	Light brownish grey (10YR 6/2 M) clay; moderate, medium, subangular blocky structure; firm, sticky and plastic; common very fine roots ; few soft iron-manganese concretions; few, fine, faint light grey (7.5YR 7/1) mottles; very strongly acid (pH 4.8); gradual smooth boundary.
Cg	96-155 cm	Light grey (7.5YR 7/1 M) sandy clay loam; moderate, medium subangular blocky structure; friable, sticky and plastic; many hard iron concretions; many coarse prominent light olive brown (2.5Y 5/4) mottles; very strongly acid (pH 4.9).

Range in characteristics : Naharbari soils are very deep. The A horizon is 15 to 25 cm thick. Its colour is in hue 10YR, value 5 to 6 and chroma 4 to 6. Its texture ranges from silty clay loam to clay loam and structure is sub-angular blocky. The B horizon is variable in texture from silty clay to clay. The colour of B horizon is in hue 10YR to 7.5YR, value 6 to 7 and chroma 2 to 8. Mottles are observed in B horizons. The C horizon is generally below 100 cm depth. Its colour is in the hue 7.5YR or 10YR, value 5 to 7, chroma 1. The texture is sandy clay loam or silty clay loam. The structure is subangular blocky. The C horizon is often gleyed.

Competing series and their differentiae : Dudhnai series identified in Goalpara district is competing. Dudhnai soils have 37 to 63 percent silt. They also have slightly higher pH (5.5 to 5.7).

Interpretation : The soils are fine textured and situated in uplands. They are moderately well drained and suitable for wheat, vegetables and mustard besides tea.

Interpretative grouping:

i) Land capability subclass IIs
ii) Irrigability subclass 2d
iii) Productivity potential Medium.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Marginally suitable	Low organic carbon

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-21	30.5	37.0	32.5	10.2	20.3	Nil
21-40	21.0	33.5	45.5	13.2	7.8	Nil
40-96	26.7	22.3	51.0	18.8	7.9	Nil
96-153	50.5	17.9	31.6	29.2	21.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-21	0.8	Nil	4.8	Nil
21-40	0.4	Nil	4.7	Nil
40-96	0.1	Nil	4.8	Nil
96-153	0.1	Nil	4.9	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-21	1.5	0.4	0.1	4.9	2.6	4.5	44	0.14
21-40	1.4	0.4	0.1	4.7	1.5	6.0	32	0.13
40-96	1.9	0.5	0.1	2.9	1.8	8.0	31	0.16
96-153	1.1	0.4	0.1	2.0	1.3	6.7	24	0.21

30. SIBSAGAR SERIES

Classification	:	Fine, loamy mixed, hyperthermic, *Aquic Dystric Eutrudepts.*
Type location	:	27°1'43" N Latitude, 94°40'34" E Longitude; Village Katanipar, P.S. and District Sibsagar, Assam.
Profile No.	:	83 J / 12 P 8
Physiographic position	:	Slightly undulating flood plains
Elevation (m)	:	105-115 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2504mm
Slope, erosion &relief	:	Slightly undulating, slight erosion
Drainage & permeability	:	Somewhat porly in mansoon, improves to well drained in post rainy period. The saturated hydraulic conductivity is low
Landuse and vegetation	:	Mostly under paddy cultivation
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar district (9,363 ha)
Soil series associated	:	Disang

Typifying pedon : Sibsagar loam-cultivated.

Ap	0-13 cm	Grey (10YR 6/1 M) loam; weak, fine, subangular blocky Structure; firm, sticky and slightly plastic; common strong brown (7.5YR 5/8) rusty specks around the decomposing roots; many fine and medium roots; polygonal 0.2-0.5 cm wide cracks; strongly acid (pH 5.1); clear wavy boundary.
Bw1	13-38 cm	Brownish yellow (10YR 6/8 M) clay; strong medium sub-angular blocky structure; friable, sticky and moderately plastic; common fine, medium roots; many coarse distinct grey (10YR 6/1) mottles; moderately acid (pH 5.6); clear wavy boundary.
Bw2	38-65 cm	Brownish yellow (10YR 6/6 M) clay loam; moderate, medium, sub-angular blocky structure; firm, sticky and moderately plastic; common fine iron-manganese nodules; few fine roots; common coarse distinct grey (10YR 6/1) mottles; moderately acid (pH 5.9); gradual smooth boundary.
Bw3	65-125 cm	Brownish yellow (10YR 6/6 M) loam; weak fine sub- angular blocky structure; firm, slightly sticky and slightly plastic; common coarse distinct grey (10YR 6/1) mottles; common hard, dark brown (more than 1 mm) iron-manganese nodules; moderately acid (pH 5.7).

Range in characteristics : The Sibsagar soils are very deep. The A horizon is 13 to 18 cm thick. Its colour is in hue of 10YR, value of-4 to 6 and chroma 1 to 2. Its texture is silty clay loam or loam. The B horizon is more than 75 cm thick Its colour is in hue of 10YR, value of 5 to 6 and chroma 6 to 8. Its texture is generally clay loam and the lower B horizons are even loam. Grey mottles are common. Dark brown Fe-Mn concretion are observed below depth of 38 cm.

Competing series and their differentiae : No competing series is identified.

Interpretation : Sibsagar soils are somewhat poorly drained and are mostly under paddy cultivation in kharif. They are suitable for vegetable cultivation in the winter.

Interpretative grouping :

i) Land capability subclass IIIw
ii) Irrigability subclass 2d

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Mustard, potato	Suitable	No limitation
Pea, tomato, cowpea	Moderately suitable	Low pH, low fertility
Wheat, cabbage, beans	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	39.7	43.7	16.6	15.1	24.6	Nil
13-38	27.0	32.0	41.0	8.5	18.5	Nil
38-65	33.5	30.7	35.8	12.9	20.6	Nil
65-125	44.1	30.3	25.6	15.8	28.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	2.0	Nil	5.1	Nil
13-38	0.3	Nil	5.6	Nil
38-65	0.3	Nil	5.9	Nil
65-125	0.2	Nil	5.7	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-13	6.3	0.3	0.1	2.1	2.2	12.2	55	0.73
13-38	12.0	0.2	0.1	1.4	1.3	16.1	76	0.39
38-65	9.7	0.3	0.1	0.9	0.8	14.9	68	0.42
65-125	8.4	0.3	0.1	0.1	0.4	13.8	64	0.54

31. SONARI SERIES

Classification	:	Fine, loamy, mixed, hyperthermic, *Oxyaquic Dystrudepts*.
Type location	:	26°58'14" N Latitude, 94°54'11" E Longitude; Mathurapur Tea Estate, P.S. Sonari, District Sibsagar, Assam.
Profile No.	:	83 J / B P2
Physiographic position	:	Nearly level alluvial plain
Elevation (m)	:	110 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2504mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Moderately well drained in mansoon, improves to well drained in post rainy period. The saturated hydraulic conductivity is low
Landuse and vegetation	:	Under tea plantation
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar district (18,807 ha)
Soil series associated	:	Naharhabi

Typifying pedon : Sonari sandy clay loam - cultivated

Ap	0-22 cm	Dark yellowish brown (10YR 4/4 M) sandy clay loam; moderate fine sub-angular blocky structure; friable, slightly sticky and slightly plastic; many fine fibrous roots ; very strongly acid (pH 4.9); clear smooth boundary.
Bw1	22-77 cm	Yellowish brown (10YR 5/8 M) sandy clay loam; moderate medium sub-angular blocky structure; friable, moderately sticky and slightly plastic; many fine prominent yellowish red (5YR 4/6) mottles; common fine fibrous roots; verystrongly acid (pH 5.0); clear smooth boundary.
Bw2	77-100 cm	Brownish yellow (10YR 6/8 M) clay loam; moderate medium and coarse sub-angular blocky structure; friable, moderately sticky and slightly plastic; many fine iron-manganese concretions; prominent light grey (10YR 7/1) mottles; few fine fibrous roots ; strongly acid (pH 5.2); gradual smooth boundary.
Bw3	100-150 cm	Brownish yellow (10YR 6/6 M) clay loam; strong medium sub-angular blocky structure; friable, moderately sticky and slightly plastic; common fine to medium distinct light grey (10YR 7/2) mottles; few fine fibrous roots; very strongly acid (pH 5.0).

Range in characteristics : The Sonari soils are very deep. The A horizon is 15 to 25 cm thick. The colour is in hue 10YR, value 4 to 5 and chroma 4 to 6. The texture is sandy clay loam or loam and structure is granular and/or sub-angular blocky. The B horizon is more than 100 cm thick. The colour is hue 10YR, value 5 to 6 and chroma 6 to 8. The texture is sandy clay loam or clay loam. The structure is medium or coarse sub-angular blocky. Distinct mottles and iron-manganese concretions are present.

Competing series and their differentiae : No competing series is identified.

Interpretation : Sonari soils are sandy clay loam or clay loam in texture and moderately well drained. These soils are suitable to tea.

Interpretative grouping :

i) Land capability subclass IIw
ii) Irrigability subclass 2sd
iii) Productivity potential High.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Marginally suitable	Low organic matter, base saturation (>35%), low fertility

*Reported earlier as Mathurapur series.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-22	50.5	25.0	24.5	12.7	37.8	Nil
22-77	54.0	20.5	25.5	13.8	40.2	Nil
77-100	43.5	29.4	27.1	12.4	31.1	Nil
100-150	43.0	29.6	27.4	12.7	30.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-22	0.60	Nil	4.9	Nil
22-77	0.37	Nil	5.0	Nil
77-100	0.11	Nil	5.2	Nil
100-150	0.19	Nil	5.0	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-22	2.9	0.5	0.2	2.1	1.5	9.6	38	0.39
22-77	2.6	0.4	0.1	2.5	1.6	8.8	35	0.35
77-100	2.8	0.4	0.1	2.6	1.9	7.9	42	0.29
100-150	2.3	0.4	0.1	1.3	1.8	8.4	33	0.31

32. ADHAKOTA SERIES

Classification	:	Coarse-loamy over sandy, mixed, hyperthermic family of *Typic Endoaquents*.
Type location	:	26°35'50" N latitude, 94°15'40" E longitude, village Adhakota, district Jorhat, Assam
Profile No.	:	83 J / 6 M-11
Physiographic position	:	Dissected piedmont plain
Elevation (m)	:	85-95 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Somewhat poorly drained in mansoon, improves to well drained in post rainy period. The saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Mostly under paddy cultivation
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (1,487 ha)
Soil series associated	:	Matikhola

Typifying pedon : Adhakota sandy loam – cultivated.

Ap	0-15 cm	Grey (10YR 5/1 M) sandy loam; massive; friable, slightly sticky and non-plastic; brownish yellow (10YR 6/6) rusty specks of decomposing roots; many fine and medium roots; very strongly acid (pH 4.6); clear smooth boundary.
Cg1	15- 58 cm	Grey to light grey (10YR 6/1, 10YR 7/1 M) sandy loam; weak medium subangular blocky structure; friable and slightly sticky; medium distinct strong brown (7.5YR 5/8) mottles; common fine and few medium roots; few fine pores; strongly acid (pH 5.1); abrupt wavy boundary.
2Cg2	58-94 cm	Grey (10YR 6/1 M) sand; single grain; loose, non-sticky and non-plastic; common fine distinct strong brown (7.5YR 5/8) mottles; few fine roots; slightly acid (pH 6.5).

Range in characteristics : The Adhakota soils are very deep. The thickness of A horizon is 15 to 20 cm. Its colour is in hue 10YR, value 5 to 7 and chroma 1 to 2. The texture is sandy loam or loamy sand. The C horizon is below 20 cm depth. Its colour is 10YR, value 6 to 7 and chroma 1 to 2. The texture is generally sandy loam or loamy sand and sand in some locations. The C horizon has many mottles of strong brown colour in the hue of 7.5 YR.

Competiting series and their differentiae : No competing series is identified.

Interpretative groupings :

i)	Land capability subclass	IIIw
ii)	Irrigability subclass	3d
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low water availability, low organic matter, low fertility
Wheat, mustard, potato, cabbage, pea, French bean, tomato, coepea	Not suitable	Low pH, low organic matter, coarse texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	60.5	26.5	13.0	24.0	36.5	Nil
15-58	60.7	24.4	14.9	20.7	40.0	Nil
58-94	95.5	2.1	2.4	2.5	93.0	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.72	Nil	4.6	Nil
15-58	0.21	Nil	5.2	0.2
58-94	0.01	Nil	6.5	0.4

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-15	2.1	0.3	0.1	1.2	0.5	4.8	52	0.37
15-58	1.8	0.2	Trace	1.7	0.9	5.3	38	0.35
58-94	0.5	0.2	0.1	0.1	0.1	1.1	72	0.46

33. BANGAON SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Typic Fluvaquents.*
Type location	:	27°05'45"N latitude, 94°23'50" E, longitude, village Bangaon, subdivision Majuli, district Jorhat, Assam
Profile No.	:	83 J /5 P11
Physiographic position	:	Nearly level to very gently sloping upper terraces of Bramhaputra
Elevation (m)	:	85-85 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Somewhat poorly or poorly drained in mansoon, improves to well drained in post rainy period. The saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Under Ahu paddy, pulses mustard, potato
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (5,881 ha)
Soil series associated	:	Kamalabari and Lahangaon

Typifying pedon : Bongaon silt loam – cultivated.

Ap	0 –20 cm	Grey (10YR 6/1 M) silt loam; massive, friable and slightly sticky; many fine and medium roots; common medium yellowish brown (10YR 5/6) rusty specks; less than 2 cm wide polygonal cracks; neutral (pH 7.2); abrupt smooth boundary.
Cg1	20-52 cm	Grey (10YR 5/1M) silty clay loam; weak medium sub-angular blocky structure; firm, sticky and slightly plastic; common fine and few medium roots; common reddish brown soft iron nodules; slightly alkaline (pH 7.6); clear smooth boundary.
2Cg2	52-125 cm	Grey (10YR 5/1 M) sandy loam; weak medium subangular blocky structure; firm and sticky; common medium distinct dark yellowish brown (10YR 4/4) mottlings; common medium dark brown soft iron nodules; few fine roots; slightly alkaline (pH 7.8).

Range in characteristics : The Bangaon soils are very deep. The colour of surface soil (A horizon) ranges from dark grey to grey in hue 10YR, value 4 to 6, chroma 1. Texture is loam or silt loam. Subsoil colour varies from grey to light grey in hue 10YR, value 5 to 6 and chroma 1 to 2. The texture in the subsoil horizons varies due to sedimentation. Generally, textures such as silt loam, silty clay loam and sandy loam alternate through the depth. Reddish brown iron nodules are common.

Note: This soil has fine silty textural class up to 52 cm depth. It has 24% sand with a diameter of 0.1 to 2 mm below 52cm. The textural class of the upper 52cm is given priority and hence fine-silty family.

Competing series and their differentiae : No competing soil series is identified.

Interpretation : The soils are silt loam or loam in texture and somewhat poorly or poorly drained due to high water table and flooding. As a result, they are suited to rice during kharif in locations not affected by severe flood; mustard, pulses and wheat can be grown in winter season.

Interpretative groupings :

i) Land capability subclass IIIw
ii) Irrigability subclass 3d
iii) Productivity potential Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture
Wheat, potato, cabbage, pea, French bean, tomato, cowpea	Suitable	No limitation
Mustard	Marginally suitable	High pH

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	36.0	52.7	11.3	25.7	10.3	Nil
20-52	13.2	59.3	27.5	12.2	1.0	Nil
52-125	53.2	31.1	15.7	29.2	24.0	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	1.72	0.04	7.2	2.0
20-52	1.63	0.06	7.6	1.2
52-125	0.81	0.07	7.8	1.0

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	8.3	0.4	0.3	Nil	Nil	9.2	98	0.81
20-52	15.8	0.4	0.2	Nil	Nil	16.6	99	0.60
52-125	9.4	0.5	0.2	Nil	Nil	10.2	99	0.65

34. BARHALLA SERIES

Classification	:	Coarse-loamy, mixed, hyperthermic family of *Humic Endoaquepts.*
Type location	:	26°41'43"N latitude and 94°15'35" E longitude, village Napamuagaon, district Jorhat, Assam
Profile No.	:	83 J /6 M-6
Physiographic position	:	Nearly level to very gently sloping flood plains of Bramhaputra valley
Elevation (m)	:	100 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slightly erosion
Drainage & permeability	:	Poorly drained in monsoon, improves to well drained in post rainy period. The saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Under paddy cultivation
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (11,942 ha)
Soil series associated	:	Titabar

Typifying pedon : Barhalla sandy loam – cultivated

Ap	0 –21 cm	Grey (10YR 5/1 M) sandy loam; massive; friable, non-sticky and non-plastic; common fine and few medium roots; strongly acid (pH 5.2); clear smooth boundary.
Bwg1	21-53 cm	Light grey (10YR 7/1 M) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; common medium distinct strong brown (7.5YR 5/8) mottles; many dark brown Fe-Mn nodules; common fine roots; very strongly acid (pH 4.5); clear smooth boundary.
Bwg2	53-123 cm	Light grey (10YR 7/1 M) sandy loam; weak subangular blocky structure; friable and slightly sticky; many medium distinct strong brown (7.5YR 5/8) mottles; few fine roots; many soft Fe-Mn nodules; extremely acid (pH 4.4).

Range in characteristics : The Barhalla soils are very deep. 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 or sandy loam. The thickness of B horizon is 80 to 110 cm. Its colour is in hue 10YR, value 6 to 7 and chroma 1 to 2. Texture is sandy loam or loam. Mottles of strong brown colour are many. The structure is weak subangular blocky.

Competing series and their differentiae : No competing series is identified.

Interpretative groupings :

i)	Land capability subclass	IIw
ii)	Irrigability subclass	2d
iii)	Productivity potential	Medium to low.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low organic matter, low fertility
Mustard, potato, frenchbean, cowpea	Marginally suitable	Low pH (4.5), low organic matter, low fertility
Wheat, cabbage, pea, tomato	Not suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-21	71.4	20.4	8.2	20.8	50.6	Nil
21-53	71.2	17.0	11.8	22.0	49.2	Nil
53-123	68.9	19.0	12.1	13.0	55.9	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-21	0.62	Nil	5.2	Nil
21-53	0.14	Nil	4.5	Nil
53-123	0.11	Nil	4.4	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-21	0.7	0.2	0.1	1.3	0.7	3.1	32	0.38
21-53	0.4	0.1	0.1	3.6	2.5	5.7	10	0.48
53-123	0.3	0.1	0.1	4.7	3.4	6.0	8	0.50

Note: This soil is placed in Humid subgroup to accommodate low base saturation percent through the surface horizon has colour value more than 3.

35. BHOGDAI SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Fluvaquentic Endoaquepts.*
Type location	:	26°47'30" N latitude, 94°13'30" E longitude, village Gajpuria, district Jorhat, Assam.
Profile No.	:	83 J /2 WTS 92
Physiographic position	:	Nearly level to very gently sloping alluvial plain
Elevation (m)	:	85-90 m above MSL
Groundwater table	:	2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping(0-1% slope), very slight erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season drainage improves in post rainy period. saturated hydraulic conductivity is low.
Landuse and vegetation	:	Paddy, potato tomato
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (14,169 ha)
Soil series associated	:	Kakilamukh, Jorhat, Dohotia, Adhakota and Majuli

Typifying pedon : Bhogdai silt loam – cultivated

Ap	0 –14 cm	Light brownish grey (10YR 6/2 M) silt loam; massive (puddle); friable, slightly sticky and slightly plastic; many fine and few medium roots; strongly acid (pH 5.3); clear smooth boundary.
Bwg1	14-28 cm	Light brownish grey (10YR 6/2 M) silt loam; weak fine sub-angular 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; moderately acid (pH 5.6); clear smooth boundary.
Bwg2	28-56 cm	Light grey (10YR 7/1 M) clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few fine and medium roots; common medium distinct strong brown (7.5YR 5/8) mottles; few soft iron nodules; moderately acid (pH 6.0); abrupt wavy boundary.
Bwg3	56-100 cm	Yellowish brown (10YR 5/8 M) silt loam; firm, moderate medium subangular blocky structure; sticky and slightly plastic; common iron nodules; few fine distinct grey (10YR 6/1) mottles; strongly acid (pH 5.5).

Range in characteristics : Bhogdai soils are very deep. The A horizon is 14 to 20 cm thick and colour is in hue 10YR, value 5 to 6 and chroma 2 to 3. The texture is loam or silt loam. The B horizon is 80-100 cm thick. The colour is in hue 10YR, value 6 to 7 and chroma 1 to 2. The texture is clay loam or 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 lower part of B horizon has colours of high chroma (4-8). The texture is silt loam. It has low chroma mottles and soft iron nodules.

Competing series and their differentiae : No competing series is identified.

Interpretative groupings :

i)	Land capability subclass	IIw
ii)	Irrigability subclass	3d
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low pH, low fertility
Mustard, potato, bean	Moderately suitable	Low pH, low fertility
Wheat, tomato, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	16.8	61.0	22.2	13.6	3.2	Nil
14-28	19.8	55.0	25.2	14.8	5.0	Nil
28-56	22.1	44.8	33.1	14.5	7.6	Nil
56-100	14.1	72.8	13.1	9.8	4.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	1.24	Nil	5.3	0.1
14-28	0.33	Nil	5.6	0.3
28-56	0.18	Nil	6.0	0.3
56-100	0.30	Nil	5.5	0.1

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-14	5.2	0.1	0.1	2.1	1.4	9.2	59	0.41
14-28	6.8	0.2	0.1	0.3	0.1	12.4	57	0.49
28-56	8.4	0.2	0.1	0.5	0.2	13.9	63	0.42
56-100	2.8	0.1	Trace	3.1	2.2	7.3	40	0.56

36. DISAI SERIES

Classification	:	Loamy-skeletal, mixed, hyperthermic family of *Typic Udorthents.*
Type location	:	26°35'32" N latitude, 94°21'11" E longitude, Disai valley reserve forest, Mariani, district Jorhat, Assam.
Profile No.	:	83 J /6 DJN-1
Physiographic position	:	Moderately steep to steep hill slopes
Elevation (m)	:	250-450 m above MSL
Groundwater table	:	>10 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Moderately steep to steep hill slope (15-50% slope), severe erosion
Drainage & permeability	:	Excessively drained with moderately high saturated hydraulic conductivity
Landuse and vegetation	:	Under researve forest, Bandardima (*Dysoxylum binectariferum*), Bor hingori (*Castonopsis hystrix*), Meki (*Shorea assamica*), Poma (*Cedrela toone*), Sisoo (*Dalbergia sissoo*) and common shrubs are Makhiloti (*Flemingia strobilifera*), Charai thengia (*Leea acuminata*), Dhekia lata (*Stenochloa palustre*)
Geology and parent material	:	Coarse ferruginous sandstones
Distribution and extent	:	Extensive in Jorhat district (4,296 ha)
Soil series associated	:	Tiru

Typifying pedon : Disai sandy loam – forest

A	0 –29 cm	Reddish yellow (5YR 6/8 M) sandy loam; weak fine granular structure; very friable, non-sticky and non- plastic; many fine to medium roots; 2 to 5% gravels of 1 to 2 cm size; very strongly acid (pH 4.9); clear smooth boundary.
AC	29-52 cm	Yellowish brown (10YR 5/6 M) sandy loam; single grain; loose, non-sticky and non-plastic; few fine and common medium roots; 30 to 40 % gravels of 2.5 to 7.5 cm size; very strongly acid (pH 4.8); gradual wavy boundary.
C	52-73 cm	Brownish yellow (10YR 6/6 M) loamy sand; single grain; loose, non-sticky and non-plastic; few medium roots; 60 to 70% gravels and stones of 2.5 to 25 cm size, 5 to 10 percent by volume; very strongly acid (pH 5.0).

Range in characteristics : The soils are moderately deep to deep. 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 or AC horizon occurs below a depth of 30 cm. The colour is in 10YR or 7.5 YR, value is 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 percent.

Competing series and their differentiae : Luki series identified in Kamrup district is competing for the taxonomic position. Luki series has less than 10 percent clay in the upper 50 cm and 13 to 25 percent below 50 cm depth. Luki occurs on foothill slopes.

Interpretative groupings :

i) Land capability subclass VIes
ii) Irrigability subclass 6t
iii) Productivity potential Low

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-29	67.0	18.6	14.4	20.7	46.3	3.5
29-52	74.0	15.6	10.4	26.7	47.3	40.0
52-73	79.5	12.7	7.8	22.6	56.9	65.0

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-29	0.66	Nil	4.9	Nil
29-52	0.20	Nil	4.8	Nil
52-73	0.06	Nil	5.0	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-29	3.7	0.3	0.1	4.0	3.2	8.4	49	0.58
29-52	1.9	0.3	0.1	3.8	2.0	6.4	36	0.61
52-73	1.2	0.2	0.1	2.9	1.8	4.8	31	0.61

37. DOHOTIA SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Humic Endoaquepts.*
Type location	:	26°2'30" N latitude, 94°7'45" E longitude, village Dohotia, P.S. Jorhat, district Jorhat, Assam,
Profile No.	:	83 J /2 WTS –62
Physiographic position	:	Nearly level to very gently sloping flood plains
Elevation (m)	:	85 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slightly eroded.
Drainage & permeability	:	Poorly or somewhat poorly drained in the monsoon ,improves in post rainy period
Landuse and vegetation	:	Mostly cultivated to paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (7,314 ha)
Soil series associated	:	Kakadanga

Typifying pedon : Dahotia silty clay loam – cultivated

Ap	0 –14 cm	Grey (10YR 5/1 M) silty clay loam; massive; firm, sticky and slightly plastic; common medium and many fine roots; common strong brown (7.5YR 5/8) rusty specks of decomposing roots; strongly acid (pH 5.1); clear smooth boundary.
A2	14-29 cm	Grey (10YR 6/1 M) silty clay loam; massive; firm, sticky and slightly plastic; common fine distinct yellowish red (5YR 5/8) mottles; common fine orange red iron nodules; few medium and common fine roots; strongly acid (pH 5.4); clear wavy boundary.
Bwg1	29-72 cm	Light grey (10YR 7/1 M) silt loam; weak medium subangular blocky structure; firm, sticky and slightly plastic; common medium distinct strong brown (7.5YR 5/6) mottles; common orange red soft iron nodules; few fine roots; strongly acid (pH 5.3); clear wavy boundary.
Bwg2	72-120 cm	Light brownish grey (10YR 6/2 M) silt loam; massive; firm, sticky and slightly plastic; many coarse distinct reddish yellow (7.5YR 6/8) mottles; few fine roots; strongly acid (pH 5.4).

Range in characteristics : The Dohotia soils are very deep. The A horizon is 14 to 30 cm thick. Its colour ranges from grey to light brownish grey in hue 10YR, value 5 to 6, chroma 1 to 2. The texture is silty clay loam or loam. The colour of B horizon is in hue 10YR, value 5 to 7 and chroma 1 to 2. Texture is silt loam or loam. The structure is weak subangular blocky. The Bhorizon has distinct mottlings of strong brown or yellowish red. Iron nodules are common in B horizons.

Competing series and their differentiae : Not identified.

Interpretative groupings :

i)	Land capability subclass	IIIw
ii)	Irrigability subclass	4d
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low pH, low fertility
Wheat, mustard, potato, tomato, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, pea, bean	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	18.7	53.3	28.0	11.3	7.4	Nil
14-29	16.6	58.1	25.3	8.0	8.6	Nil
29-72	20.6	59.4	20.0	10.5	10.1	Nil
72-120	19.1	57.4	23.5	10.4	8.7	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	1.33	Nil	5.1	Nil
14-29	0.60	Nil	5.4	Nil
29-72	0.50	Nil	5.3	Nil
72-120	0.35	Nil	5.4	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-14	2.6	0.2	0.1	3.2	2.8	10.9	26	0.39
14-29	2.8	0.1	0.1	2.3	2.0	10.7	28	0.42
29-72	3.2	0.1	0.1	3.0	2.5	10.1	34	0.50
72-120	2.8	0.1	0.1	3.7	3.1	12.3	24	0.52

Note: The humic subgroup needs a moist colour value of 3 in the surface horizon. This soil does not satisfy this condition. However, it is classified in Humic subgroup to accommodate its low base saturation percent which otherwise goes uncared.

38. JORHAT SERIES

Classification	:	Coarse-loamy, mixed, hyperthermic family of *Typic Fluvaquents.*
Type location	:	26°48' N latitude, 94°26' E longitude, village Nahat Tipomia, district Jorhat, Assam.
Profile No.	:	83 J /5 AST – 7
Physiographic position	:	Very gently sloping alluvial plains
Elevation (m)	:	85-90 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season improves in post rainy period. Saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Mostly cultivated to paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (13,326 ha)
Soil series associated	:	Kakilamukh, Bhogdoi, Dohotia, Titabar

Typifying pedon : Jorhat silt loam – cultivated

Apg1	0-11 cm	Grey (10YR 5/1 M) silt loam; massive (puddle); friable, slightly-sticky and non-plastic; many roots; very strongly acid (pH 5.0); clear smooth boundary.
Ag2	11-33 cm	Light grey (10YR 7/2 M) silt loam; weak medium sub-angular blocky structure; friable, slightly sticky and non-plastic; many fine and few medium roots; moderately acid (pH 6.0); abrupt smooth boundary.
2Cg1	33-75cm	Grey (10YR 6/1 M) sandy loam; weak fine sub-angular blocky structure; friable, non-sticky and non-plastic; few fine roots; strongly acid (pH 5.1); clear smooth boundary.
3Cg2	75-120 cm	Light grey (10YR 7/1 M) silt loam; massive; friable, slightly sticky and non-plastic; strongly acid (pH 5.1).

Range in characteristics : The Jorhat soils are very deep. The thickness of A horizon is 14 to 35 cm. Its colour is in hue 10YR, value 5 to 7 and chroma 1 to 2. The structure is massive or sub angular blocky and texture is silt loam or loam. The colour of C horizon is in hue 10YR, value 6 to 7 and chroma 1 to 2. The texture is silt loam or sandy loam. The structure is massive or weak medium sub-angular blocky.

Competing series and their differentiae : No competing series identified.

Interpretative groupings :

i)	Land capability subclass	IIw
ii)	Irrigability subclass	2d
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, low fertility
Potato	Moderately suitable	Low pH, low organic matter, low fertility
Wheat, mustard, tomato, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, bean, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-11	33.0	56.2	10.8	15.2	17.8	Nil
11-33	32.7	58.0	9.3	8.5	24.2	Nil
33-75	70.8	21.5	7.7	36.5	34.3	Nil
75-120	14.1	75.2	10.7	4.1	10.0	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-11	0.99	Nil	5.0	Nil
11-33	0.16	Nil	6.0	Nil
33-75	0.17	Nil	5.1	Nil
75-120	0.37	Nil	5.1	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-11	1.7	0.1	0.2	1.3	0.7	4.9	41	0.45
11-33	3.0	0.1	0.1	0.3	0.1	4.6	69	0.49
33-75	2.2	0.1	0.1	1.3	0.6	4.2	57	0.54
75-120	2.4	0.1	0.1	1.4	0.6	4.8	54	0.45

39. KAKADANGA SERIES

Classification	:	Coarse-loamy, mixed, hyperthermic family of *Aquic Udorthents.*
Type location	:	26°44 '25" N latitude, 94°05'45" E longitude, village Puranimati, P.S. Jorhat, district Jorhat Assam
Profile No.	:	83 J /2 WTS – 82
Physiographic position	:	Nearly level to very gently sloping lower flood plain of the river Brahmaputra
Elevation (m)	:	85 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Somewhat poorly drained, improves in post monsoon. Saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Rice
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (11,323 ha)
Soil series associated	:	Kakilamukh, Adhakota, Dohotia

Typifying pedon : Kakadanga sandy loam – cultivated

Ap	0-18 cm	Grey (10YR 5/1 M) sandy loam; massive (puddle); friable, slightly sticky and non-plastic; yellowish brown to brown rusty specks of decomposing roots; common medium many fine roots; strongly acid (pH 5.3); abrupt smooth boundary.
2A2	18-35 cm	Strong brown (7.5YR 5/8 M) loam; massive; few medium distinct grey(10YR 6/1) mottles; friable, sticky and slightly plastic; fine common soft iron-manganese concretions; common fine and medium roots; moderately acid (pH 5.9); abrupt smooth boundary.
3C1	35-83 cm	Yellowish brown (10YR 5/8 M) sandy loam; common distinct light grey(10YR 7/1) mottles; massive tending to blocky structure; friable slightly sticky and non-plastic; common fine and few medium roots; fine common soft iron-manganese concretion; moderately acid (pH 5.6); clear smooth boundary.
3C2	83-125 cm	Strong brown (7.5YR 5/8 M) sandy loam; common medium distinct light grey (10YR 7/1) mottles; massive; friable; non- sticky and non-plastic; few fine roots; fine many dark brown iron–manganese concretions; moderately acid (pH 5.8).

Range in characteristics : The Kakadanga soils are very deep. The A horizon is about 35 cm thick. Its colour is in hue 10YR or 7.5YR, value 4 to 5 and chroma 1 to 8. Its texture is sandy loam or loam or silt loam. The C horizon has colours in hue 10YR or 7.5YR, value 5 to 6 and chroma 6 to 8. The texture is dominantly sandy loam. The subsoil is distinctly mottled with grey (10YR 6/1 to 7/1) color. It also has orange red Fe-Mn concretions. The structure is massive.

Drainage and saturated hydraulic conductivity : Somewhat poorly drained for sometime in the rainy season. The drainage improves in the post-rainy periods. The saturated hydraulic conductivity is moderately low.

Use and vegetation : The soils are mostly under paddy and some area remain unused.

Competing series and their differentiae : No competing series identified.

Interpretative groupings :

i)	Land capability subclass	IIw
ii)	Irrigability subclass	3d
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Wheat, potato, pea, cowpea	Marginally suitable	Coarse texture, low pH, low water availability, low fertility
Cabbage	Not suitable	Low pH, low fertility
Mustard, tomato	Moderately suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0 1-0.05)	Others (2.0-0.1)	
0-18	70.5	14.8	14.7	41.6	28.9	Nil
18-35	34.4	43.5	22.1	16.1	18.3	Nil
35-83	68.7	20.7	10.6	38.9	29.8	Nil
83-125	71.3	18.9	9.8	35.4	35.4	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-18	0.95	Nil	5.3	0.2
18-35	0.30	Nil	5.9	0.4
35-83	0.21	Nil	5.6	0.4
83-125	0.16	Nil	5.8	0.5

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-18	1.3	0.1	0.2	1.1	0.7	4.1	39	0.28
18-35	3.5	0.1	0.2	2.3	1.5	6.9	55	0.31
35-83	2.2	0.1	0.1	1.8	0.9	3.8	63	0.38
83-125	2.4	0.1	0.1	0.9	0.5	3.9	66	0.40

40. KAMALABARI SERIES

Classification	:	Coarse-silty over sandy, mixed, hyperthermic family of *Mollic Fluvaquents*
Type location	:	27°58'55" N latitude, 94°11'45" E longitude, village Pakajara, Subdivision Majuli, district Jorhat, Assam.
Profile No.	:	83 J / 1 MS-8
Physiographic position	:	River terraces in Majuli
Elevation (m)	:	60 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), very slight erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season, improves during winter season. Saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Mostly under paddy and grasses
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Dibrugarh (32,587 ha), Jorhat (21,551 ha), Dhemaji (43,161 ha), and Lakhimpur (22,970 ha) districts
Soil series associated	:	Bangaon, Lahangaon, Majuli,

Typifying pedon : Kamalabari sandy loam – cultivated

Ap	0-18 cm	Very dark grey (10YR 3/1 M) sandy loam; weak fine sub-angular blocky; friable, non-sticky and non-plastic; many fine and common medium roots; neutral (pH 6.6); clear smooth boundary
2Cg1	18-59 cm	Grey (10YR 5/1 M) loam; many medium distinct dark brown (10YR 4/3) mottles; weak medium sub-angular blocky structure; friable, sticky and slightly plastic; common fine and few medium roots; many dark brown concretions; neutral (pH 7.2); abrupt irregular boundary
3Cg2	59-72 cm	Light grey (10YR 6/1 M) sand; many medium faint (10YR 4/2) mottles; single grain; loose, non-sticky and non-plastic; few fine roots; slightly alkaline (pH 7.4); abrupt irregular boundary.
4Cg3	72-105 cm	Grey (10YR 5/1 M) loamy sand; single grain; very friable, non-sticky and non-plastic; many dark brown soft iron concretions; slightly alkaline (pH 7.4).

Range in characteristics : The soils are very deep. The A horizon is 18 to 20 cm thick. Its colour is in hue 10YR, value 3 to 5 and chroma 1 to 2. The texture is loamy sand or sandy loam. The colour of C horizon is in hue 10YR, value 5 to 7 and chroma 1 to 2. Texture is sand to loam. There are many distinct dark brown mottles and many dark brown soft iron concretions.

Competing series and their differentiae : No competing series was identified.

Interpretative groupings :

i)	Land capability subclass	IIIw
ii)	Irrigability subclass	3d
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Wheat cowpea	Marginally suitable	Coarse texture, low water availability
Mustard, potato, cabbage, tomato, cowpea	Suitable	No limitation
Pea, bean	Moderately suitable	Coarse texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-18	70.8	14.6	14.6	32.2	38.6	Nil
18-59	41.0	46.8	12.2	31.0	10.0	Nil
59-72	94.7	3.1	2.2	20.5	74.2	Nil
72-105	77.7	19.5	3.7	47.6	29.1	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-18	2.25	-	6.6	0.6
18-59	0.58	-	7.2	0.8
59-72	0.38	-	7.4	0.7
72-105	0.23	-	7.4	0.6

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-18	3.0	0.3	0.2	-	-	5.1	69	0.35
18-59	2.8	0.4	0.2	-	-	4.5	76	0.37
59-72	1.0	0.3	0.2	-	-	1.6	93	0.73
72-105	2.0	0.2	0.2	-	-	2.6	92	0.70

41. KAKILAMUKH SERIES

Classification	:	Coarse-silty over sandy, mixed, hyperthermic family of *Mollic Fluvaquents*.
Type location	:	26°48'15" N latitude, 94°11'04" E longitude, village Jankhana, P.S. Jorhat, district Jorhat, Assam
Profile No.	:	83 J / 1 AST – 112
Physiographic position	:	Nearly level to very gently sloping active flood plain
Elevation (m)	:	85-90 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season, improves in post rainy period. Saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Rice
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (13,703 ha)
Soil series associated	:	Majuli, Kakadanga, Jorhat, Bhogdai

Typifying pedon : Kakilamukh sandy loam - cultivated

Ap	0-13 cm	Grey (10YR 6/1 M) sandy loam; massive (puddle); common yellowish brown (10YR 5/4) root mottles; friable, non-sticky and non-plastic; few medium and many fine roots; moderately acid (pH 5.7); clear smooth boundary.
C1	13-28 cm	Light grey (10YR7/1 M) loamy sand; few medium faint yellowish brown(10 YR 5/6) mottles; massive; very friable, non-sticky and non-plastic; common fine roots; neutral (pH 6.8); abrupt smooth boundary.
C2	28-40 cm	Brown to strong brown (7.5YR 5/4 & 5/6 M) loamy sand; many medium distinct light grey (10YR 7/1) mottles; massive; very friable, non-sticky and non-plastic; common fine roots; neutral (pH 6.9); abrupt smooth boundary.
2Cg1	40-78 cm	Light grey (10YR 7/1 M) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable, sticky and slightly plastic; few fine roots; slightly acid (pH 6.3); clear smooth boundary
2Cg2	78-120 cm	Grey (10YR 5/1 M) loam; massive; friable and sticky; common medium and fine pores; slightly acid (pH 6.4).

Range in characteristics : The Kakilamukh soils are very deep. 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 or loamy sand. The colour of C horizons is in hue 10YR and 7.5 YR, value 5 to 7 and chroma 1 to 6. Texture is loamy sand or sand in the upper 40 to 50 cm and thereafter it is clay loam or loam. Yellowish brown mottling are abundant in sub-soils.

Competing series and their differentiae : No competing series identified.

Interpretation : Kakilamukh soils are subjected to flooding. Rice is grown in the rainy season. Common crops such as mustard, pulses, oilseeds and vegetables may be grown in the post rainy season with supplementary irrigation wherever possible.

Interpretative groupings :

i)	Land capability subclass	IIIws
ii)	Irrigability subclass	3ds
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Wheat, mustard, cabbage, pea, potato	Marginally suitable	Coarse texture, low organic matter, low pH, low water availability, low fertility
Bean, tomato, cowpea	Moderately suitable	Coarse texture low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	72.3	15.0	12.7	23.5	48.8	Nil
13-28	81.1	11.2	7.7	4.1	77.0	Nil
28-40	78.5	13.0	8.5	14.3	64.2	Nil
40-78	31.0	39.2	29.8	26.9	4.1	Nil
78-120	31.4	44.0	24.6	18.8	12.6	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O) (dSm^{-1})
0-13	0.63	Nil	5.7	0.2
13-28	0.12	Nil	6.8	0.4
28-40	0.18	Nil	6.9	0.4
40-78	0.43	Nil	6.3	0.3
78-120	0.68	Nil	6.4	0.3

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-13	2.4	0.2	0.2	0.6	0.4	5.2	54	0.41
13-28	1.6	0.1	0.1	0.1	Trace	2.2	82	0.29
28-40	2.1	0.1	0.1	Trace	Nil	2.8	82	0.33
40-78	6.4	0.1	0.1	0.4	0.3	8.8	75	0.29
78-120	5.4	0.1	0.1	0.4	0.2	7.4	76	0.30

42. LAHANGAON SERIES

Classification	:	Coarse-loamy, mixed, hyperthermic family of *Aeric Fluvaquents*.
Type location	:	27°2'20" N latitude, 94°15'30" E longitude, village Lahangaon, subdivision Majuli, district Jorhat, Assam
Profile No.	:	83 I / 8 P28
Physiographic position	:	River terraces in Majuli island
Elevation (m)	:	70-80 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3 % slope), sligt erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season, improves to well drained in winter with moderately low saturated hydraulic conductivity
Landuse and vegetation	:	Paddy, mustard, pulses
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Tinsukia (24,084 ha), Jorhat (7,701 ha), Dhemaji (21,521 ha), and Lakhimpur (10,895 ha) districts
Soil series associated	:	Bangaon, Kamalabari

Typifying pedon : Lahangaon loam – cultivated

Ap	0 –31 cm	Dark grey (10YR 4/1 M) and dark yellowish brown (10YR 4/4 M) loam; massive; friable and slightly sticky; many medium and fine roots; slightly alkaline (pH 7.4); clear broken boundary.
C1	31-49 cm	Yellowish brown (10YR 5/4 M) sandy loam; weak fine sub-angular blocky structure; friable, non-sticky and non-plastic; common fine roots; few medium distinct greyish brown (10YR 5/2) mottlings; slightly alkaline (pH 7.7); abrupt smooth boundary.
2Cg2	49-71 cm	Light grey (10YR 7/1 M) loamy sand; single grain; loose, non-sticky and non-plastic; common medium yellowish brown (10YR 5/4) mottlings; slightly alkaline (pH 7.8); abrupt smooth boundary.
3Cg3	71-116 cm	Grey (10YR 5/1 M) loam; weak medium subangular blocky structure; friable and sticky; few fine roots; common medium distinct yellowish brown (10YR 5/6) mottling; moderately alkaline (pH 7.9); abrupt smooth boundary.
4Cg4	116-150 cm	Yellowish brown (10YR 5/6 M) silt loam; massive; friable, slightly sticky and slightly plastic; common fine distinct grey (10YR 5/1) mottling; slightly alkaline (pH 7.8).

Range in characteristics : The Lahangaon soils are very deep. Colour of the A horizon is in hue 10YR , value 4 to 5, chroma 1 to 2. Texture is sandy loam or loam. Subsoil (C horizon) colour is in hue 10YR, value 5 to 7 and chroma 1 to 6; texture is loamy sand or sandy loam or silt loam. Many distinct yellowish brown and grey mottlings are present. These soils are highly stratified, the thickness of individual deposition is less than 50 cm.

Competing series and their differentiae : The Rupahi series identified in Nagaon district and Jinjiram series identified in Goalpara are competing. Rupahi series has a pH of 6.0-6.5 and no calcium carbonate. Jinjiram series has a pH of 6.5-7.4 and no calcium carbonate.

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.

Interpretative groupings :

i)	Land capability subclass	IIIws
ii)	Irrigability subclass	3ds
iii)	Productivity potential	Medium.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-31	50.0	36.0	14.0	31.6	18.9	Nil
31-49	48.0	45.8	6.2	43.8	4.2	Nil
49-71	81.9	14.6	3.5	16.5	65.4	Nil
71-116	50.8	32.7	16.5	30.3	50.8	Nil
116-150	26.2	61.6	12.2	20.8	5.4	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-31	1.94	0.03	7.4	1.9
31-49	0.97	0.08	7.7	1.8
49-71	0.62	0.08	7.7	1.6
71-116	0.58	0.08	7.9	1.8
116-150	0.46	0.06	7.8	2.0

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-31	6.1	0.5	0.3	Nil	Nil	7.0	98	0.50
31-49	3.5	0.4	0.2	Nil	Nil	4.3	95	0.69
49-71	2.0	0.2	0.1	Nil	Nil	2.4	96	0.68
71-116	6.4	0.6	0.3	Nil	Nil	7.4	99	0.44
116-150	6.0	0.6	0.2	Nil	Nil	6.5	100	0.53

43. MAJULI SERIES

Classification	:	Mixed, hyperthermic family of *Typic Psammaquents.*
Type location	:	27°02`20"N latitude, 94°21'10"E longitude, village Marangiagaon, Subdivision Majuli, district Jorhat, Assam.
Profile No.	:	83 I / 8 P20
Physiographic position	:	Nearly level to very gently sloping active flood plain and river terrace
Elevation (m)	:	75 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season, improves to well drained in winter with moderately high saturated hydraulic conductivity
Landuse and vegetation	:	Paddy, mustard, pulses
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (10,695 ha)
Soil series associated	:	Kamalabari, Kakilamukh, Bhogdai

Typifying pedon : Majuli sandy loam-cultivated

Ap	0-15 cm	Dark grey (10YR4/1 M) sandy loam; weak fine sub angular blocky structure; friable, non-sticky and non-plastic; common fine and few medium roots; neutral (pH 7.2); abrupt irregular boundary.
C1	15-56 cm	Dark yellowish brown (10YR 4/4 M) loamy sand; single grain; loose, non-sticky and non-plastic; common medium distinct greyish brown (10 YR 5/2) and few fine light grey (10YR 7/1) mottles; common fine roots; slightly alkaline (pH 7.4); abrupt irregular boundary.
C2	56-125cm	Light grey (10YR7/1 M) sand; single grain; loose, non-sticky and non-plastic; common medium distinct dark yellowish brown (10YR 4/4) mottles; slightly alkaline (pH 7.4).

Range in characteristics : The Majuli soils are very deep. The A horizon is about 15 cm thick. Its colour is in hue 10YR, value 4 to 6 and chroma 1 to 2 and texture is loamy sand or sandy loam. The C horizon is more than 100 cm thick. Its colour is in hue 10YR, value 4 to 7 and chroma 1 to 4 and texture is loamy sand or sand. Common distinct greyish brown or light grey mottles are present.

Competing series and their differentiae : No competing series identified.

Interpretation : Majuli soils are severely affected by inundation 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.

Interpretative groupings :

i)	Land capability subclass	IVws
ii)	Irrigability subclass	4s
iii)	Productivity potential	low

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Wheat	Marginally suitable	Coarse texture, low water availability
Mustard, ptato, cabbage, pea, bean, tomato, cowpea	Moderately suitable	Coarse texture, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	53.0	40.1	6.9	35.1	17.9	Nil
15-56	84.0	13.0	3.0	48.1	35.9	Nil
56-125	95.5	3.3	1.2	50.3	45.2	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O) (dSm^{-1})
0-15	2.15	0.40	7.2	0.7
15-56	0.89	0.06	7.4	0.6
56-125	0.18	0.08	7.6	0.9

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	4.4	0.3	0.2	Nil	Nil	5.1	96	0.74
15-56	1.5	0.4	0.1	Nil	Nil	2.0	98	0.67
56-125	0.5	0.3	0.1	Nil	Nil	0.9	99	0.75

44. MARIANI SERIES

Classification	:	Coarse-loamy, mixed. hyperthermic family of *Oxyaquic Dystrudepts*.
Type location	:	26°42' N latitude, 94°17' E longitude, Murmurya Tea Estate, P.S. Mariani, district Jorhat, Assam
Profile No.	:	83 J /6 M-1
Physiographic position	:	Gently sloping piedmont plain
Elevation (m)	:	95 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), slight erosion
Drainage & permeability	:	Moderately well drained in mansoon & well drained in post monsoon\. Saturated hydraulic conductivity is moderately high
Landuse and vegetation	:	Tea plantation, pasture land
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (12,273 ha)
Soil series associated	:	Teok

Typifying pedon : Mariani sandy loam – cultivated

Ap	0-18 cm	Pale brown (10YR 6/3 M) sandy loam; moderate medium sub-angular blocky structure; friable and slightly sticky and non-plastic; common medium and many fine roots; very strongly acid (pH 4.6); clear wavy boundary
Bw1	18-55 cm	Strong brown (7.5YR 5/6 M) sandy loam; weak medium sub-angular blocky structure; friable and slightly sticky and non-plastic; common fine and few medium roots; few krotovinas; very strongly acid (pH 4.7); clear wavy boundary.
Bw2	55-105cm	Reddish yellow (7.5YR 6/8 M) sandy loam; few medium, distinct light brownish grey (10YR 6/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; few fine roots; common medium reddish brown iron concretions; few kortovinas; very strongly acid (pH 4.8)

Range in characteristics : Mariani soils are very deep. The thickness of A horizon is 12 to 25 cm . Its colour is in hue 10YR, value 5 to 6 and chroma 3 to 4. The texture is sandy loam or loamy sand. The thickness of B horizon is 90 to 100 cm. Its colour is in hue 10YR or 7.5YR, value 5 to 6 and chroma 6 to 8. Its texture is sandy loam or loam and structure is weak medium subangular blocky. Reddish brown iron concretions are present below the depth of 50 cm.

Competing series and their differentiae : No competing series identified.

Interpretative groupings :

i)	Land capability subclass	IIIes
ii)	Irrigability subclass	3t
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Tea	Moderately suitable	Low organic carbon, coarse texture

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-18	60.5	21.3	18.2	17.7	42.8	Nil
18-55	53.2	34.6	12.2	22.3	30.9	Nil
55-105	62.9	25.6	11.5	21.2	41.7	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O) (dSm^{-1})
0-18	1.15	Nil	4.6	Nil
18-55	0.38	Nil	4.7	Nil
55-105	0.25	Nil	4.8	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-18	1.4	0.2	0.2	2.1	1.0	6.0	30	0.33
18-55	1.1	0.2	0.1	3.1	1.9	5.9	24	0.48
55-105	1.0	0.2	0.1	2.6	1.1	5.7	23	0.49

45. MATIKHOLA SERIES

Classification	:	Fine-loamy, mixed, hyperthermic family of *Typic Endoaquepts*.
Type location	:	26°47'05"N latitude, 94°07'45" E longitude, village Matikhola, district Jorhat, Assam.
Profile No.	:	83 J/3 GKW-49
Physiographic position	:	Nearly level to very gently piedmont plain
Elevation (m)	:	100-110 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slightly erosion
Drainage & permeability	:	Some what poor drained in mansoon & well drained in post monsoon\. Saturated hydraulic conductivity is low
Landuse and vegetation	:	Rice
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (2,762 ha)
Soil series associated	:	Bhogdai

Typifying pedon : Matikhola loam – cultivated

Ap	0 –16 cm	Brown (10YR 5/3 M) loam; massive; friable, slightly sticky and slightly plastic; many fine and few medium roots; moderately acid (pH 5.6); gradual smooth boundary.
Bwg1	16-33 cm	Greyish brown (10YR 5/2 M) loam; moderate medium subangular blocky; friable, slightly sticky and slightly plastic; common fine light yellowish brown (10 YR 6/4) mottles; few fine and medium roots ; neutral (pH 6.8); gradual smooth boundary.
Bwg2	33-54 cm	Greyish brown (10YR 5/2 M) clay loam; moderate medium subangular blocky; firm, sticky and plastic; few fine roots; many fine yellowish brown (10 YR 5/4) mottles; neutral (pH 7.0); clear smooth boundary.
Bwg3	54-72 cm	Pale brown (10YR 6/3) clay loam; weak medium subangular blocky; firm, sticky and plastic; common fine light grey (10 YR 6/1) and common medium yellowish brown (10YR 5/6) mottles; neutral (pH 6.9); diffuse smooth boundary.
Bwg4	72-100 cm	Light brownish grey (10YR 6/2 M) clay loam; massive; firm, sticky and plastic; common distinct yellowish brown (10YR 5/6) mottles; neutral (pH 7.1).

Range in characteristics : The Matikhola soils are very deep. The A horizon is 12 to 25 cm thick. The texture is loam or silt loam. The colour is in hue 10YR, value 5 to 6 and chroma 2 to 3. The B horizon has colour in hue 10YR and value is 5 to 6 and chroma 1 to 2. The texture is clay loam or loam and there are common grey and yellowish brown mottles. The structure is moderate or weak subangular blocky. The lower B horizons remains massive. Roots are distributed up to a depth of 35 cm.

Competing series and their differentiae : The Barbhagia series identified in Morigaon district and Ambari series identified in Kamrup district are competing for the taxonomic position. The Barbhagia series has loamy sand texture below 60 cm (up to 100 cm). Ambari series has higher sand content, 50-70% and very less silt content, 15-18%.

Interpretative groupings :

i)	Land capability subclass	IIw
ii)	Irrigability subclass	3d
iii)	Productivity potential	Medium to high.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low water availability, low pH (5.1), low organic matter, low fertility
Mustard	Suitable	No limitation
Wheat	Moderately suitable	Low pH, low fertility
Potato, beans, tomato, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, peas	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	30.0	46.5	23.5	10.1	19.9	Nil
16-33	25.5	48.5	26.0	9.4	16.1	Nil
33-54	24.5	46.5	29.0	4.8	19.7	Nil
54-72	28.3	43.2	28.5	9.4	18.9	Nil
72-100	27.8	41.7	30.5	6.5	21.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	0.90	Nil	5.1	Nil
16-33	0.56	Nil	6.8	Nil
33-54	0.26	Nil	7.0	Nil
54-72	0.11	Nil	6.9	Nil
72-100	0.18	Nil	7.1	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-16	5.4	0.3	0.1	1.3	0.3	8.5	68	0.36
16-33	9.0	0.4	0.1	0.2	Trace	11.6	82	0.45
33-54	11.5	0.4	0.1	0.3	Trace	13.5	89	0.47
54-72	12.6	0.4	0.1	0.2	Trace	14.7	89	0.51
72-100	13.6	0.5	0.1	0.2	Trace	15.8	90	0.52

46. NAGINI SERIES

Classification	:	Coarse-loamy, mixed, hyperthermic family of *Fluventic Dystrudepts*.
Type location	:	26°38'06"N latitude, 94°23'26" E longitude, Disai valley reserve forest Mariani, district Jorhat, Assam.
Profile No.	:	83 J /6 DJN-3
Physiographic position	:	Gently sloping upper piedmont plain
Elevation (m)	:	100-150 m above MSL
Groundwater table	:	5-10 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), moderate to severe erosion
Drainage & permeability	:	Well drained Saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Forest vegetation, Tea Gardens
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Sibsagar (45,649 ha), and Jorhat (6,114 ha) districts
Soil series associated	:	Tiru, Sildubi, Mariani

Typifying pedon : Nagini sandy loam – forest

A	0 –14 cm	Yellowish brown (10YR 5/4 M) sandy loam; weak fine granular structure; very friable, non-sticky and non-plastic; many very fine and fine roots; extremely acid (pH 4.4); gradual smooth boundary.
Bw1	14-47 cm	Brownish yellow (10YR 6/6 M) sandy loam; weak fine subangular blocky structure; friable, non-sticky and non plastic; common medium roots; very strongly acid (pH 4.6); gradual wavy boundary.
Bw2	47-91 cm	Yellowish brown (10YR 5/8 M) sandy loam; weak medium sub-angular blocky structure; friable , slightly sticky and non- plastic; common medium roots; very strongly acid (pH 4.8); gradual wavy boundary.
BW3	91-120 cm	Brownish yellow (10YR 6/6 M) sandy clay loam; moderate medium sub angular blocky structure; friable, slightly sticky and non-plastic; common medium roots; few medium iron nodules; very strongly acid (pH 4.6).

Range in characteristics : The Nagini soils are deep to very deep. 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 is sandy loam. The B horizon is 60 to 90 cm thick. The colour of B horizon is in 10YR, value is 5 to 6 and chroma 6 to 8. The texture is sandy loam or sandy clay loam. There are few iron nodules of 2 to 3 mm size in the lower portion of B horizon. The structure is moderate or weak medium subangular blocky with granular structure in the surface. The roots are distributed up to 100 cm or more depth.

Competing series and their differentiae : No competing soil series is identified.

Interpretative groupings :

i) Land capability subclass IIIe
ii) Irrigability subclass 3t
iii) Productivity potential Medium

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	66.1	22.4	11.5	9.0	57.1	Nil
14-47	62.5	25.0	12.5	14.0	50.0	Nil
47-91	57.1	25.4	17.5	13.0	44.1	Nil
91-120	55.0	24.0	21.0	10.6	44.4	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	0.54	Nil	4.4	Nil
14-47	0.30	Nil	4.6	Nil
47-91	0.18	Nil	4.8	Nil
91-120	0.30	Nil	4.6	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-14	1.5	0.3	0.1	1.3	1.0	3.6	45	0.31
14-47	1.0	0.2	0.1	1.7	1.3	3.4	30	0.27
47-91	1.3	0.2	0.1	1.8	1.6	4.4	32	0.25
91-120	1.2	0.2	0.1	2.6	2.3	4.9	23	0.24

47. ROWRIAH SERIES

Classification	:	Fine, mixed, hyperthermic family of *Humic Endoaquepts.*
Type location	:	26°39'5"N latitude, 94°8'45" E longitude, village Rowriah, district Jorhat, Assam.
Profile No.	:	83 J / 2 WTS-70
Physiographic position	:	Nearly level to very gently sloping flood plains of Brahmaputra valley
Elevation (m)	:	85 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Poorly drained. Saturated hudraulic conductivity is low
Landuse and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat district (8,327 ha)
Soil series associated	:	Titabar

Typifying pedon : Rowriah silt loam – cultivated

Ap	0 –20 cm	Grey (10YR 6/1 M) silt loam; massive; firm sticky and slightly plastic; common strong brown (7.5YR 5/8) rusty specks of roots; strongly acid (pH 5.2); clear smooth boundary.
Bwg1	20-48 cm	Grey (10YR 6/1 M) silty clay loam; strong medium subangular blocky structure; firm, sticky and slightly plastic; common medium distinct yellowish brown (10YR 5/8) mottles; common dark red to brown Fe-Mn nodules; common fine and few medium roots; strongly acid (pH 5.1); gradual smooth boundary.
Bwg2	48-62 cm	Light grey (10YR 7/1 M) clay; strong medium subangular blocky structure; very firm, sticky and slightly plastic; many medium yellowish brown (10YR 5/8) mottles; few fine roots; strongly acid (pH 5.1); gradual smooth boundary.
Bwg3	62-100 cm	Light grey (10YR 7/1 M) clay loam; massive; firm, sticky and slightly plastic; many medium yellowish brown (10YR 5/8) mottles; very strongly acid (pH 5.0).

Range in characteristics : The Rowriah soils are very deep. The thickness of A horizon is 16 to 20 cm. Its colour is in hue 10YR, value 5 to 6, chroma 1 to 2. The texture is silt loam or 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 chroma 1. Texture is silty clay loam or clay loam or clay. Mottling of yellowish brown colour and variable quantities of dark brown to dark red iron-manganese nodules are common. The roots are distributed up to a depth of 60 cm.

Competing series and their differentiae : Goalpara series identified in Goalpara district is competing series. Goalpara soils have 50-68 percent clay in the particle size control section.

Interpretative groupings :

i)	Land capability subclass	IIIw
ii)	Irrigability subclass	4d
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, low fertility
Wheat, mustard, beans, tomato, cowpea	Marginally suitable	Low pH, low organic matter, low fertility
Potato	Moderately suitable	Low pH, low organic matter, low fertility
Cabbage, pea	Not suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	22.9	52.7	24.4	14.9	8.0	Nil
20-48	15.6	49.0	35.4	10.0	5.6	Nil
48-62	23.6	35.0	41.4	19.9	3.7	Nil
62-100	32.4	32.4	35.2	27.7	4.7	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	0.88	Nil	5.2	Nil
20-48	0.42	Nil	5.1	Nil
48-62	0.32	Nil	5.1	Nil
62-100	0.19	Nil	5.0	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	2.7	0.1	0.2	1.8	1.3	6.1	49	0.25
20-48	2.2	0.1	0.1	4.2	2.5	8.4	29	0.24
48-62	2.0	0.1	0.1	4.5	2.8	9.6	23	0.23
62-100	1.4	0.1	0.1	4.1	3.2	7.9	20	0.22

48. SANGSOA SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Typic Dystrudepts*.
Type location	:	26°40'45"N latitude,94°05'10" E longitude, village Sangsoa, district Jorhat, Assam.
Profile No.	:	83J/2 WTS-102
Physiographic position	:	Dissected or gently sloping piedmont plain
Elevation (m)	:	92-95 m above MSL
Groundwater table	:	1-5 or more
Rainfall	:	1950 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), slight erosion
Drainage & permeability	:	Moderately well drained. Saturated hydraulic conductivity is low
Landuse and vegetation	:	Tea plantation
Geology and parent material	:	Sedimentary
Distribution and extent	:	Extensive in Jorhat district (12,196 ha)
Soil series associated	:	Teok

Typifying pedon : Sangsoa silt loam – Tea plantation

Ap	0 –13 cm	Yellowish brown (10YR 5/6 M) silt loam; moderate medium granular structure; friable, slightly sticky and slightly plastic; common medium and many fine roots; strongly acid (pH 5.4); gradual wavy boundary.
Bw1	13-25 cm	Brownish yellow (10YR 6/8 M) silty clay loam; moderate medium sub-angular blocky structure; firm, sticky and slightly plastic; medium few soft red iron nodules; few krotovinas (2-3 cm diameter); few coarse, commonmedium and fine roots; strongly acid (pH 5.2); gradual wavy boundary.
Bw2	25-88 cm	Brownish yellow (10YR 6/8 M) silt loam; moderate medium sub-angular 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; strongly acid (pH 5.2); gradual wavy boundary.
Bw3	88-103 cm	Light grey (10YR 7/2 M) loam; massive but tending to blocky structure; friable, slightly sticky and slightly plastic; common medium distinct strong brown (7.5 YR 5/8) mottles; common fine soft iron-manganese nodules; strongly acid (pH 5.3).

Range in characteristics : Sangsoa soils are very deep. The thickness of A horizon is 13 to 18 cm. Its colour is in hue 10YR, value 5 to 6 and chroma 4 to 6. The texture is silt loam or loam. The B horizon is 80 to 100 cm thick. The colour is in hue 10YR, value 5 to 6 and chroma 6 to 8. Texture is silty loam or silty clay loam. Fine or medium soft iron-manganese nodules and strong brown mottels are common.

Competing series and their differentiae : The Tiru series which is also identified in Jorhat district in competing. It is on hill slopes developed from sandstone and shales. It has higher sand (45-67%) content and lower silt (14-22%) in the upper 50 cm. The higher content of very fine sand makes it fine-silty family inspite of the lower silt content.

Interpretative groupings :

i)	Land capability subclass	IIe
ii)	Irrigability subclass	3t
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Moderately suitable	Low organic carbon, high base saturation

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	22.9	52.0	25.1	21.1	1.8	Nil
13-25	17.0	49.8	33.2	11.8	5.2	Nil
25-88	31.0	50.0	19.0	24.5	6.5	Nil
88-103	44.0	39.0	17.0	31.6	12.4	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	1.26	Nil	5.4	Nil
13-25	0.42	Nil	5.2	Nil
25-88	0.22	Nil	5.2	Nil
88-103	0.14	Nil	5.3	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-13	3.0	0.2	0.1	2.1	1.4	7.9	42	0.31
13-25	2.3	0.1	0.1	2.8	2.0	9.4	27	0.28
25-88	1.7	0.1	0.1	3.2	2.7	6.1	31	0.32
88-103	1.3	0.1	0.1	3.6	3.0	5.8	26	0.34

49. SILDUBI SERIES

Classification	:	Fine, loamy, mixed, hyperthermic family of *Dystric Eutrudepts*.
Type location	:	26°27'15" N latitude, 94°10'40" E longitude, village Sildubi near Barhalla, district Jorhat, Assam.
Profile No.	:	83 J /3 P9
Physiographic position	:	Undulating piedmont plains
Elevation (m)	:	100-125 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Undulating, moderate erosion
Drainage & permeability	:	Well drained. Saturated hydraulic conductivity is moderately low
Landuse and vegetation	:	Mostly under vegetable cultivation some area used for grazing & pasture
Geology and parent material	:	Alluvium / Colluvium
Distribution and extent	:	Extensive in Jorhat district (1,000 ha)
Soil series associated	:	Nagini

Typifying pedon : Sildubi loam – fallow land

A	0 –15 cm	Dark brown (10YR 4/3 M) loam; moderate medium granular structure tending to subangular blocky structure; friable, sticky and slightly plastic; many fine roots; neutral (pH 6.7); gradual smooth boundary.
Bw1	15-32 cm	Dark yellowish brown (10YR 4/6 M) loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; many fine roots; few earthworm holes; moderately acid (pH 5.9); clear wavy boundary.
Bw2	32-88 cm	Yellowish brown (10YR 5/4 M) loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few earthworm holes; gravels are of 2 cm in diameter and 10 percent by volume; moderately acid (pH 6.0); gradual wavy boundary.
Bw3	88-118 cm	Yellowish brown (10YR 5/6 M) loam; moderate medium sub angular blocky structure; friable, slightly sticky and slightly plastic; many medium strong brown (7.5YR 5/8) mottles; few fine roots; 15 percent gravels of 2.5 to 10 cm size; neutral (pH 6.8).

Range in characteristics : The Sildubi are very deep .The A horizon is 15 to 20 cm thick. The colour is in hue 10YR, value 4 to 6 and chroma 3 to 4. Its texture is loam or sandy loam. The B horizon is 80 to 100 cm thick. The colour is in hue 10YR, value 5 to 6 and chroma 4 to 6. The B horizons have many strong brown (7.5 YR 5/8) mottles. Its texture is loam or sandy clay loam. Coarse fragments of size 2.0 to 10 cm constitute 10 to 20 percent volume of the soil in the lower part of B horizon. Roots are distributed up to a depth of 100 cm.

Competing series and their differentiae: Competing series is the Disang series identified in Sibsagar district. The soils of Disang series have a pH ranging between 4.3 and 5.0

Interpretative groupings :

i)	Land capability subclass	IIIe
ii)	Irrigability subclass	3t
iii)	Productivity potential	Medium

Suitability to crops

Crop	Suitability class	Limitations
Mustard, potato, beans	Suitable	No limitation
Cabbage, tomato, wheat, pea, cowpea	Moderately suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	38.5	36.0	25.5	6.7	31.8	Nil
15-32	40.6	33.9	25.5	7.1	33.5	Nil
32-88	44.3	35.7	20.0	3.8	40.5	10.4
88-118	49.1	32.4	18.5	10.0	39.1	14.8

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.58	Nil	6.7	0.4
15-32	0.78	Nil	5.9	0.3
32-88	0.08	Nil	6.0	0.4
88-118	0.08	Nil	6.8	0.5

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	11.2	0.7	0.9	0.4	Trace	14.6	88	0.57
15-32	9.1	0.6	0.3	0.5	Trace	14.1	71	0.55
32-88	9.6	0.6	0.1	0.5	Trace	14.1	73	0.71
88-118	9.6	0.5	0.1	0.3	Trace	12.7	80	0.69

50. TEOK SERIES

Classification	:	Fine-loamy, mixed, Hyperthermic family of *Typic Dystrudepts*.
Type location	:	26°49'47" N latitude, 94°06'30" E longitude, village Teok, district Jorhat, Assam.
Profile No.	:	83 J / 5 P2
Physiographic position	:	Dissected or gently sloping alluvial uplands
Elevation (m)	:	85 m above MSL
Groundwater table	:	2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Moderately well drained. Saturated hydraulic conductivity is moderately low
Land use and vegetation	:	Tea plantation
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Tinsukia (45,331 ha), Sibsagar (44,521 ha), Jorhat (16,324 ha) and Golaghat (31,543 ha) districts
Soil series associated	:	Mariani, Sangsoa

Typifying pedon : Teok sandy loam – Tea plantation.

Ap	0 –11 cm	Dark brown (10YR 4/3 M) sandy loam; weak medium granular structure; friable non-sticky and non- plastic; many medium, common fine and few coarse roots; extremely acid (pH 4.2); clear smooth boundary.
Bw1	11-28 cm	Yellowish brown (10YR 5/4 M) sandy loam; weak medium sub-angular blocky structure; friable, non-sticky and non-plastic; common fine, few medium and coarse roots; extremely acid (pH 4.1); gradual smooth boundary.
Bw2	28-69 cm	Yellowish brown (10YR 5/6 M) sandy loam; moderate medium sub-angular blocky structure; friable, slightly sticky and slightly plastic; few medium distinct strong brown (7.5YR 5/8) mottles; few fine and medium roots; extremely acid (pH 4.1); gradual smooth boundary.
Bw3	69-115 cm	Brownish yellow (10YR 6/6 M) sandy clay loam; massive; firm, sticky and slightly plastic; common medium distinct strong brown (7.5 YR 5/8) mottles; few fine roots; extremely acid (pH 4.1).

Range in characteristics : The Teok soils are very deep. The thickness of A horizon is 10 to 20 cm. Its colour is in hue 10YR, value 3 to 4, and chroma 3 to 4. Texture is sandy loam or loam. The thickness of B horizon is 70 to 100 cm and its colour is in hue 10YR, value 5 to 6 and chroma 4 to 6. Texture is sandy loam or loam or sandy clay loam. The structure is moderate or weak medium subangular block. High chroma mottles in the hue 7.5YR are common in B horizons.

Competing series and their differentiae : The Rangingpara series identified in Kamrup district and Garopara series identified in Goalpara district are competing. The Rangingpara series has fine loamy textures throughout the depth with a clay percent of 19-36 and sand percent of 33-50. The pH ranges between 4.8-5.1. It is under forest plantation. The Garopara series is on steep slopes. It has more than 20 percent gravels. It is under forest plantation.

Interpretative groupings :

i)	Land capability subclass	IIe
ii)	Irrigability subclass	2t
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Moderately suitable	Low organic matter, low pH (4.1)

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-11	78.0	12.8	9.2	21.4	51.6	Nil
11-28	65.0	26.7	8.3	30.2	34.8	Nil
28-69	56.5	26.7	16.8	27.7	28.8	Nil
69-115	50.0	18.8	31.2	28.5	21.5	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-11	1.38	Nil	4.2	Nil
11-28	0.44	Nil	4.1	Nil
28-69	0.40	Nil	4.1	Nil
69-115	0.29	Nil	4.1	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-11	0.6	0.1	0.2	2.8	1.5	4.1	22	0.44
11-28	0.5	0.1	0.1	2.2	1.8	3.5	20	0.42
28-69	0.6	0.1	0.1	3.1	2.6	4.7	17	0.28
69-115	0.6	0.1	0.1	4.6	3.9	6.8	12	0.22

51. TIRU SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of Typic *Dystrudepts.*
Type location	:	26°35'57" N latitude, 94°20'53" E longitude, Disai valley reserve forest Mariani, district Jorhat, Assam.
Profile No.	:	83 J / 6 DJN – 5
Physiographic position	:	Strongly sloping to moderately steep hill slopes
Elevation (m)	:	180-250 m above MSL
Groundwater table	:	>10 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Strongly to moderately steep (30-50% slope), severe erosion
Drainage & permeability	:	Well drained. Saturated hudraulic conductivity is low
Land use and vegetation	:	Researve forest, Jhum cultivation in some places. *Schima Wallichii, Cadrela tona, Shorea robasta, Bambusa sp.*
Geology and parent material	:	Weathered sandstone / shale
Distribution and extent	:	Extensive in Jorhat district (11,025 ha)
Soil series associated	:	Disai , Nagini

Typifying pedon : Tiru sandy loam – forest

A	0 –20 cm	Yellowish brown (10YR 5/6 M) sandy loam; moderate fine granular structure; friable, slightly sticky and non-plastic; many fine and medium roots; very strongly acid (pH 4.6); gradual smooth boundary.
Bw1	20-55 cm	Brownish yellow (10YR 6/8 M) clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; common fine and medium roots; very strongly acid (pH 4.5); gradual wavy boundary.
Bw2	55-110 cm	Reddish yellow (7.5 YR 6/8 M) clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few fine and medium roots; gravels of 2 to 7.5 cm about 5-10 percent by volume; very strongly acid (pH 4.5); clear smooth boundary
C	110-142 cm	Yellowish brown (10YR 5/4 M) loam; weak medium subangular blocky structure ; friable, slightly sticky and slightly plastic; 2.5 to 25 cm size gravels and stones about 30-40 percent by volume; very strongly acid; (pH 4.6).

Range in characteristics: The Tiru soils are deep to very deep. The A horizon is 12 to 28 cm thick. The colour of A horizon is in hue 10YR, value 4 to 5 and chroma 4 to 6. The texture is sandy loam or loam. The B horizon is 70 to 95 cm thick and has clay loam or loam texture. The colour is in hue 10 YR or 7.5 YR, value is 5 to 6 and chroma 6 to 8. This horizon has 5 to 15 percent gravels. The C horizon has colour in hue 10 YR, value 5 to 6 and chroma 4 to 8. The texture is loam or sandy loam and there are abundant gravels and stones of size 2.5 to 25 cm, which is 25 to 45 percent by volume.

Competing series and their differentiae : The Sangsoa series identified in Jorhat district is competing series. Sangsoa series has lower sand content (17-31%) and higher silt content (49-52%)

up to 88 cm depth. Sangsoa series occurs on gently sloping alluvial uplands and has low chroma colour in the lower layers and Fe-Mn concretions throughout the pedon below the plough layer.

Interpretative groupings:

i)	Land capability subclass	VIIe
ii)	Irrigability subclass	6t
iii)	Productivity potential	Low to medium

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	67.5	14.3	18.2	46.7	20.8	Nil
20-55	45.0	22.4	32.6	34.9	10.1	5.2
55-110	28.5	37.1	34.4	25.3	3.2	15.6
110-142	35.1	39.4	25.5	23.5	11.6	40.0

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	0.78	Nil	4.6	-
20-55	0.48	Nil	4.5	-
55-110	0.18	Nil	4.5	-
110-142	0.10	Nil	4.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	2.2	0.2	0.1	4.1	3.4	6.9	36	0.38
20-55	2.7	0.1	0.1	6.6	5.9	9.8	30	0.30
55-110	2.4	0.1	0.1	8.3	7.4	11.6	22	0.34
110-142	1.7	0.1	0.1	7.6	6.8	9.8	19	0.38

52. TITABAR SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Aeric Endoaquept.*
Type location	:	26°36'20" N latitude, 94°22'00" E longitude, village Baregaon, P.S. Titabar, district Jorhat , Assam.
Profile No.	:	83 J /2 WTS-18
Physiographic position	:	Nearly level flood plain
Elevation (m)	:	90 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Some what poorly drained in rainy season, improved in winter & spring. Saturated hydraulic conductivity is low.
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Jorhat (16,064 ha) and Golaghat (21,029 ha) districts
Soil series associated	:	Rowriah, Jorhat, Barhalla, Dohotia

Typifying pedon : Titabor silty clay loam - cultivated

Ap	0-14 cm	Grey (10YR 6/1 M) silty clay loam massive (puddle); common strong brown (7.5YR 5/8) specks of decomposing roots; firm moderately sticky and plastic; common fine and medium roots; less than 1 cm wide cracks; strongly acid (pH 5.2); gradual wavy boundary.
Bwg1	14-49 cm	Yellowish brown (10YR 5/6 M) silt loam; moderate medium angular blocky structure ; common coarse distinct grey (10YR 6/1) mottles; friable, moderately sticky and slightly plastic; few fine roots; few fine soft iron manganese concretions; strongly acid (pH 5.4); gradual wavy boundary.
Bwg2	49-80 cm	Brown (7.5YR 5/2 M) clay loam; common coarse distinct light gray (10YR 7/1) mottles; moderate coarse angular blocky structure; firm, sticky and moderately plastic; few fine roots; common dark brown soft fine iron manganese concretions; strongly acid (pH 5.4); gradual wavy boundary.
Bwg3	80-102 cm	Brown (7.5YR 5/2 M) clay loam; massive; firm, sticky and moderately plastic; strongly acid (pH 5.2).

Range in characteristics : The Titabar soils are very deep. The A horizon is 14 to 20 cm thick. The colour is in hue 10YR, value 5 to 6 and chroma 1 to 2. The texture is silt loam or silty clay loam. The thickness of B horizon is 50 to 75 cm. It is in hue 10YR and 7.5YR, value 5 to 6 and chroma 2 to 6. The texture is silt loam or silty clay loam or clay loam. Soft iron manganese concretions are common in B-horizons. Roots are distributed up to a depth of 80 cm.

Competing series and their differentiae : The Dihing series identified in Nagaon district, the Kumarkuchi series identified in Morigaon district and the Habilagaon series identified in Kamrup district are competing series. The Dhing series has a sand content of less than 5 percent below 50 cm

and a pH of 6.6-7.3 throughout the depth. The Kumarkuchi series has a sand content of more than 40 percent below 50 cm and a pH of less than 5 in the surface horizon. The Habilagaon series has a clay content of 32-53 percent in the upper 50 cm. It has a pH of 6.4-7.0 throughout the depth.

Interpretation : Titabar soils are strongly acid, slow in saturated hydraulic conductivity and subject to overflow during rainy season. They are suited to rice in kharif and wheat, pulses and oilseeds in rabi season.

Interpretive groupings :

i) Land capability subclass IIw
ii) Irrigability subclass 2d
iii) Productivity potential Medium

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, coarse texture, low fertility
Wheat, mustard, bean, tomato, cowpea, potato	Marginally suitable	Low pH, low organic matter, low fertility
Cabbage, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	16.9	55.8	27.3	13.3	3.6	Nil
14-49	16.1	62.0	21.9	12.6	3.5	Nil
49-80	22.8	48.1	29.1	14.7	8.1	Nil
80-102	25.6	46.0	28.4	19.0	6.6	Nil

Depth(cm)	O.C (%)	$CaCO_3$ (%)	pH (1:2.5) H_2O	E.C. (1:2.5) H_2O)(dS m^{-1})
0-14	0.77	Nil	5.2	Nil
14-49	0.25	Nil	5.5	Nil
49-80	0.21	Nil	5.4	Nil
80-102	0.13	Nil	5.2	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-14	2.9	0.1	2.1	0.9	0.9	8.9	35	0.33
14-49	3.8	0.1	0.5	0.2	0.2	7.1	56	0.32
49-80	4.2	0.1	1.2	0.8	0.8	9.2	48	0.32
80-102	3.0	0.1	1.8	1.0	1.0	8.4	37	0.30

53. FURKATING SERIES

Classification	:	Fine-silty mixed, hyperthermic family of *Fluventic Eutrudepts*
Type location	:	26°37'50" N latitude, 93°53'15" E longitude, village Borgaon, district Golaghat, Assam.
Profile No.	:	83 F / G35 / R1
Physiographic position	:	Gently sloping to undulating alluvial upland of old floodplains
Elevation (m)	:	80-90 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Well drained. Saturated hydraulic conductivity is low
Land use and vegetation	:	Mostly Sugarcane
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Golaghat district (9,336 ha)
Soil series associated	:	Golaghat

Typifying pedon : Furkating silty clay loam – cultivated.

Ap	0-20 cm	Brown (10YR 5/3 M) silty clay loam; massive structure; friable, sticky and plastic; many very fine and fine, few medium roots; strongly acid (pH 5.1); clear smooth boundary.
Bw1	20-38 cm	Yellowish brown (10YR 5/6 M) silty clay loam; weak fine subangular blocky structure; friable, sticky and plastic; common very fine and fine, few medium roots; very strongly acid (pH 4.9); gradual smooth boundary.
Bw2	38-76 cm	Light olive brown (2.5Y 5/6 M) and brown to dark brown (7.5YR 4/4 M) silty clay loam; weak fine subangular blocky structure; friable, sticky and plastic; few very fine, fine and medium roots; strongly acid (pH 5.3); diffused smooth boundary.
Bw3	76-120 cm	Yellowish brown (10YR 5/6 M) and olive brown (2.5Y 4/4 M) silt loam; massive structure; sticky and slightly plastic; few very fine and fine roots; strongly acid (pH 5.1).

Range in characteristics : The Furkating soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 5, chroma 3 to 4. The texture is silty clay loam or loam. The stucture is massive due to frequent cultural operations like puddling. The B horizon is 80-100 cm thick and has two or more sub horizons. Its colour is in the hue 10YR or 2.5Y, value 4 to 5, chroma 5 to 6. The texture is silty clay loam in the upper part and silt loam or loam in the lower part. The structure is weak, subangular block in the upper parts and massive in the lower parts. The C horizon is generally at a depth of 100 cm and has no structural development. The soils are either strongly acid or very strongly acid throughout the depth.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Tea	Suitable	No limitations
Mustard, potato	Marginally suitable	Low pH, low fertility
Wheat, cabbage, tomato, bean, pea, cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	2.4	61.1	36.5	0.1	2.3	-
20-38	7.1	61.9	31.0	0.7	6.4	-
38-76	3.4	62.6	34.0	0.1	3.3	-
76-120	9.1	74.4	16.5	0.5	8.6	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	1.52	-	5.1	-
20-38	0.58	-	4.9	-
38-76	1.02	-	5.3	-
76-120	1.36	-	5.1	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	5.05	0.61	0.11	0.17	2.35	10.2	69.6	0.28
20-38	2.06	0.37	0.08	0.08	3.88	7.75	38.8	0.25
38-76	4.30	0.48	0.08	0.26	2.35	11.22	65.1	0.33
76-120	2.06	0.32	0.07	0.11	4.39	10.2	35.3	0.62

54. GOLAGHAT SERIES

Classification	:	Fine, mixed, hyperthermic family of *Fluvaquentic Dystrudepts.*
Type location	:	26°27'16" N latitude, 93°55'57" E longitude, Village Thoramukh, district Golaghat, Assam.
Profile No.	:	83 F / G 54 / R2
Physiographic position	:	Gently sloping to slightly undulating alluvial upland of the flood plains
Elevation (m)	:	80-90 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Well drained. Saturated hydraulic conductivity is low
Land use and vegetation	:	Tea plantation, Vegetables
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Golaghat district (20,746 ha)
Soil series associated	:	Furkating

Typifying pedon : Golaghat clay – cultivated

Ap	0-17 cm	Yellowish brown (10YR 5/6 M) clay; weak medium subangular blocky structure; slightly hard, friable sticky and plastic; many very fine, fine and common medium roots; very strongly acid (pH 4.9); diffuse smooth boundary.
Bw1	17-35 cm	Light olive brown (2.5Y 5/4 M) clay; few fine faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocks; friable, sticky and plastic; common fine, very fine and few medium roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bw2	35-65 cm	Light olive brown (2.5Y 5/5 M) clay; common medium distinct light grey (2.5Y 7/0) mottles; moderate medium subangular blocks; friable, sticky and plastic; few fine and medium roots; very strongly acid (pH 4.9); gradual smooth boundary.
Bw3	65-110 cm	Yellowish brown (10YR 5/4 M) clay; common medium distinct light grey to grey (10YR 6/1) and common fine distinct brown to dark brown (7.5YR 4/4) mottles; massive structure; sticky and plastic; few medium roots; moderately acid (pH 5.7).

Range in characteristics : Golaghat soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 5, chroma 4 to 6. The texture is clay or clay loam. The structure is moderate or weak, medium, subangular blocks. The B horizon is 80 to 100 cm thick and has 2 or more subhorizons. Its colour is in the hue 2.5Y or 10YR, value 4 to 5, chroma 4 to 6. The texture is mostly clay. The structure is moderate, medium, subangular blocks in the upper parts and massive in the lower parts of B horizon. Low chroma mottles (redox depletions with chroma 1 or less) are observed below the depth of 35 cm. Fine and medium roots are found throughout the pedons.

Competing series : No competing series is identified.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Moderately suitable	Low organic matter, low fertility
Mustard, potato	Marginally suitable	Low pH, low fertility
Wheat, cabbage, tomato, beans, pea, cowpea	Not suitable	Low pH, low base saturation, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-17	31.0	28.4	40.6	12.5	18.5	-
17-35	30.2	29.0	40.8	12.1	18.1	-
35-65	29.7	21.8	48.5	12.9	16.8	-
65-110	22.2	23.8	54.0	9.0	13.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-17	1.25	-	4.9	-
17-35	0.45	-	5.0	-
35-65	0.41	-	4.9	-
65-110	0.44	-	5.7	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-17	1.93	0.26	0.07	-	0.95	7.10	32	0.17
17-35	2.78	0.37	0.08	0.10	2.55	7.34	44	0.17
35-65	3.74	0.41	0.08	0.32	1.84	8.14	52	0.17
65-110	5.57	0.52	0.10	0.18	0.66	10.44	59	0.19

55. KAZIRANGA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquepts*
Type location	:	26°42'0" N latitude, 93°25'48" E longitude, Kaziranga Reserve Forest. district Golaghat, Assam.
Profile No.	:	83 F / G31 / R1
Physiographic position	:	Nearly level or very gently sloping flood plains
Elevation (m)	:	60-80 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Poorly drained. Saturated hydraulic conductivity is low
Land use and vegetation	:	Natural vegetation dominated by *Phragmitis karka, saccharum procerum*
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Golaghat district (7,205 ha)
Soil series associated	:	Rangajan

Typifying pedon : Kaziranga silty clay loam - grassland.

A	0-14 cm	Very dark grey (5Y 3/1 M) silty clay loam; moderate, very coarse angular blocky structure, hard, firm sticky and plastic, few, very fine pores; many, fine and very fine roots; strongly acid (pH 5.2), gradual smooth boundary.
Bwg1	14-44 cm	Dark grey (5Y 4/1 M) clay loam, moderate, very coarse angular blocky structure, hard, firm sticky and plastic, few very fine iron manganese concretions, common, fine and very fine roots, neutral (pH 6.8), diffused smooth boundary.
Bwg2	44-70 cm	Grey (5Y 5/1 M) clay loam, massive structure, firm, sticky and plastic, few, very fine iron manganese concretions; few, very fine roots; neutral (pH 7.0).

Range in characteristics : Kaziranga soils are very deep. The A horizon is 12 to 30 cm thick. It has colours in hue 5Y or 2.5Y, value 3 to 4, chroma 1 to 2. The texture is silty clay loam or clay loam. The structure is moderate very coarse angular blocks. The soil reaction is strongly acid to moderately acid. The B horizon is 50 to 70 cm thick and has 2 or more sub horizons. It has colours in the hue 2.5Y to 5Y value 4 to 5 chroma 1 to 2. The texture is silty clay loam or clay loam. The structure is coarse angular blocks in the upper part and generally massive in lower parts. Fe, Mn concretions are distributed throughout the B horizon. The B horizon is slightly acid or neutral. The roots are concentrated at surface horizon and the amount decreases with depth. The C horizon is generally below the depth of 70 to 100 cm.

Competing series : Ambari series identified in Kamrup district is competing series.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	10.1	60.7	29.2	0.4	9.7	-
14-44	30.0	31.7	38.3	1.6	28.4	-
44-70	19.7	47.9	32.4	1.9	17.8	-
70+	26.7	45.0	28.3			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	0.54	-	5.2	-
14-44	2.07	-	6.8	-
44-70	0.54	-	7.0	-
70+				

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-14	10.28	0.78	0.21	0.32	0.14	16.73	96	0.57
14-44	11.59	0.83	0.14	0.09	-	12.44	99	0.32
44-70	10.28	0.78	0.09	0.09	-	11.22	99	0.35
70+								

56. RANGAJAN SERIES

Classification	:	Fine, mixed, hyperthermic family of *Aquic Dystric Eutrudept.*
Type location	:	26°35'35" N latitude, 93°22'3" E longitude, Village Rangajan, district Golaghat, Assam.
Profile No.	:	83 F / S1 / M3
Physiographic position	:	Very gently sloping old flood plains
Elevation (m)	:	70-80 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Moderately well drained. Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Golaghat district (31,119 ha)
Soil series associated	:	Kaziranga

Typifying pedon : Rangajan silty clay – cultivated

Ap	0-16 cm	Greyish brown (2.5Y 5/2 M) silty clay; moderate medium subangular blocky structure; firm, very sticky and plastic; many, very fine and fine roots; moderately acid (pH 5.9), clear smooth boundary.
Bw1	16-49 cm	Light olive brown (2.5Y 5/4 M) silty clay; common medium distinct greyish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; firm, very sticky and plastic; few, very fine and fine roots; slightly acid (pH 6.2), gradual smooth boundary.
Bw2	49-68 cm	Yellowish brown (10YR 5/6 M) clay loam; common, medium, distinct grey (10YR 5/1) mottles; weak medium subangular blocky structue; friable sticky and slightly plastic; few, very fine roots; slightly acid (pH 6.3); gradual smooth boundary.
BC	68-120 cm	Yellowish brown (10YR 5/6 M) clay loam; common medium distinct grey (10YR 5/1) mottles; massive structure; sticky and slightly plastic; slightly acid (pH 6.3).

Range in characteristics : Rangajan soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 2.5Y or 10YR, value 4 to 5, chroma 2 to 3. The texture is silty clay or silty clay loam. The stucture is moderate or weak, medium, subangular blocks. The B horizon is 50 to 75 cm thick and has two or more sub horizons. Its colour is in the hue 10YR or 2.5Y, value 4 to 5, chroma 4 to 6. The texture is silty clay or clay loam. The structure is moderate medium subangular blocks in the upper parts and massive in the lower parts. The B horizon has mottles of chroma 1. The BC or C horizon is below the depth of, generally 100 cm. It is yellowish brown and has no structural development. The surface horizon is moderately acid while the subsoils are slightly acid.

Competing series : No competing series is identified.

Interpretation:

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Potato	Suitable	No limitation
Wheat, cabbage, mustard, tomato, beans, pea, cowpea	Moderately suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	4.4	46.1	49.5	1.7	2.7	-
16-49	6.6	51.9	41.5	3.5	3.1	-
49-68	42.8	21.2	36.0	30.5	12.3	-
68-120	43.0	22.3	34.7	29.8	13.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	1.10	-	5.9	-
16-49	0.75	-	6.2	-
49-68	0.23	-	6.3	-
68-120	0.18	-	6.3	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-16	9.35	0.52	0.09	0.18	-	12.3	81	0.25
16-49	8.79	0.48	0.08	0.09	-	10.2	92	0.25
49-68	6.73	0.43	0.04	0.18	-	8.1	89	0.23
68-120	6.95	0.44	0.02	-	-	8.0	93	0.23

57. DHING SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Aeric Endoaquepts.*
Type location	:	26°33'0" N latitude, 92°58'00" E longitude, village Dalgaon, district Nagaon, Assam.
Profile No.	:	83 D / ANT 98
Physiographic position	:	Nearly level or very gently sloping low lands of the old flood plains
Elevation (m)	:	60-70 m
Groundwater table	:	1-2 m
Rainfall	:	2213 mm
Slope, erosion &relief	:	Level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Poorly drained in rainy season, improves to well in post rainy period. Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nagaon district (13,456 ha)
Soil series associated	:	Nagaon, Rupahi

Typifying pedon : Dhing loam - cultivated.

Ap	0-15 cm	Dark greyish brown (2.5Y 4/2 M) loam; moderate coarse subangular blocky structure; hard, firm sticky and plastic; many fine and very fine roots; neutral (pH 6.6); clear smooth boundary.
Bw1	15-46 cm	Very dark grey (10YR 3/1 M) silty clay loam; moderate coarse subangular blocky structure; very hard, firm, sticky and plastic; common, very fine and fine roots; neutral (pH 6.6); gradual smooth boundary.
Bw2	46-79 cm	Light olive brown (2.5Y 5/4 M) silty clay loam; common medium distinct dark grey (10YR 4/1) mottles; moderate coarse subangular blocky structure; very hard, firm, sticky and plastic; few, very fine roots; neutral (pH 7.0); gradual smooth boundary.
C	79-120 cm	Light olive brown (2.5Y 5/4 M) silty clay loam; many medium distinct dark grey (10YR 4/1) mottles; massive structure; firm, sticky and plastic; neutral (pH 7.3).

Range in characteristics : The Dhing soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 2.5Y or 10YR, value 3 to 4, chroma 1 to 2. The texture is loam or silt loam. The structure is moderate or weak, medium or coarse, subangular blocks. This horizon has many fine and very fine roots. The B horizon is 60 to 80 cm thick and has 2 or more sub horizons. Its colour is in the hue 10YR or 2.5Y, value 3 to 5, chroma 1 to 4. The texture is generally silty clay loam. The structure is strong or moderate, coarse or medium, subangular blocks. It has few fine roots. The upper part of B horizon has colours of low chroma while the lower part has colours in high chroma and have low chroma mottles. The C horizon is generally below the depth of 80 cm. It has colour in hue 2.5Y or 10YR, value 4 to 6 chroma 4 to 6 with low chroma mottles. The texture is silty clay loam. There was no structural development in C horizon. These soils are neutral through out the depth of 150cm.

Competing series and their differentiae : Titabar series identified in Jorhat district and Kumarkuchi series identified in Morigaon district and Habilagaon series identified in Kamrup district are competing series. Titabar soils have sand content of 22 to 25 per cent below 50 cm depth. They have a pH of 5.2 to 5.5. Kumarkuchi soils have sand content more than 40 percent below 50 cm depth. They have a pH of 5.6 to 6.0 in control section and less than 5 in the surface. Habilagaon have a clay content of 32 to 53 percent in upper 50 cm. They have a pH of 6.4 to 7.8.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Cabbage, potato	Suitable	No limitation
Wheat, mustard, tomato, beans, pea, cowpea	Moderately suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	29.7	43.3	27.0	24.1	5.6	-
15-46	10.4	58.1	31.5	6.8	3.6	-
46-79	4.5	66.5	29.0	2.5	2.0	-
79-120	5.2	59.3	35.5	2.0	3.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.98	-	6.6	-
15-46	0.68	-	6.6	-
46-79	0.56	-	7.0	-
79-120	0.49	-	7.3	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	12.2	0.96	0.08			13.82	96	0.51
15-46	15.4	1.09	0.11			17.66	94	0.56
46-79	12.0	0.83	0.11			13.82	94	0.48
79-120	-	-	-			-	-	-

58. KATHIATALI SERIES

Classification	:	Fine, mixed, hyperthermic family of *Oxyaquic Eutrudepts.*
Type location	:	26°8'57" N latitude, 92°45'00" E longitude, Village Sarupathar, District Nagaon, Assam.
Profile No.	:	83 B / ANT 91
Physiographic position	:	Nearly level or very gently sloping flood plains
Elevation (m)	:	60-70 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1380 mm
Slope, erosion &relief	:	Nearly level or very gently sloping (0-1% slope), slightly to moderately eroded
Drainage & permeability	:	Moderately well drained and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy, mustard
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nagaon district (23,636 ha)
Soil series associated	:	Laokhowa

Typifying pedon : Kathiatali silt loam - cultivated.

Ap	0-15 cm	Light olive brown (2.5Y 5/4 M) silt loam; moderate, coarse subangular blocky structure; firm, slightly sticky and slightly plastic; common, very fine and fine roots; strongly acid (pH 5.4); gradual smooth boundary.
Bw1	15-40 cm	Dark brown (10YR 3/3 M) clay loam; common, medium, faint, dark yellowish brown (10YR 3/4) mottles; moderate, coarse, angular blocky structure; firm, sticky and plastic; common, fine and very fine roots; moderately acid (pH 5.9); gradual smooth boundary.
Bw2	40-75 cm	Dark yellowish brown (10YR 3/6 M) clay; common, fine, distinct, dark brown (7.5YR 3/4) mottles; moderate, coarse, angular blocky structure; very firm, very sticky and plastic; common very fine iron manganese concretions; few, fine roots; slightly acid (pH 6.4); gradual smooth boundary.
BC	75-120 cm	Brown to dark brown (7.5YR 4/4 M) clay loam; common, fine, distinct, yellowish red (5YR 5/8) mottles; massive structure; firm, sticky and plastic; common, medium, iron-manganese conceretions; neutral (pH 7.0).

Range in characteristics : Kathiatali soils are very deep. The A horizon is 20 cm thick. Its colours is in hue 2.5Y or 10YR, value 4 to 6, chroma 4 to 6. The texture is silt loam or loam. The structure is moderate, medium or coarse, subangular block. It has many or common very fine and fine roots. It is strongly or moderately acid. The B horizon is 50 to 70 cm thick and has two or more sub horizons. Its colour is in hue 10YR, value 3 to 4, chroma 3 to 6. Redox concentrations with chroma 4 or more are observed. The texture is clay loam or clay. The structure is moderate, medium or coarse, angular blocks. The lower part of B horizon has Fe, Mn concretions. The BC or C horizon generally occurs below depth of 60 to 75 cm. It has colour in the hue 10YR or 7.5YR, value 4, chroma 3 to 4. The texture is clay or clay loam. It has no structural development. Fe, Mn concretions and high chroma

mottles are common. The surface soils are strongly acid and acidity decreases with depth to neutral below the depth of 75 cm.

Competing series and their differentiae : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low organic matter, low pH, low fertility
Potato	Moderately suitable	Low pH, low organic matter
Wheat, mustard, tomato, beans, cowpea	Marginally suitable	Low pH, coarse texture, low fertility
Cabbage, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	25.0	50.5	24.5	6.2	18.8	-
15-40	28.2	35.3	36.5	9.1	19.1	-
40-75	25.5	33.5	41.0	8.0	17.5	-
75-120	26.8	33.7	39.5	8.3	18.5	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.98	-	5.4	-
15-40	0.59	-	5.9	-
40-75	0.30	-	6.4	-
75-120	0.16	-	7.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	5.0	0.38	0.14			7.4	74.6	0.30
15-40	7.6	0.43	0.15			9.8	83.5	0.27
40-75	10.6	0.42	0.19			13.4	83.7	0.32
75-120	16.2	0.56	0.20			16.4	100.0	0.42

59. LAOKHOWA SERIES

Classification	:	Mixed, hyperthermic family of *Oxyaquic Udipsamment*
Type location	:	26°30'00" N latitude, 92°39'57" E longitude, Village Sabundhara, district Nagaon, Assam.
Profile No.	:	83 B / GP 73
Physiographic position	:	Very gently sloping recent flood plains
Elevation (m)	:	50-60 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	2213 mm
Slope, erosion &relief	:	Very gently sloping (0-1% slope), slightly erosion,
Drainage & permeability	:	Somewhat poorly drained in rainy season, improves to well drained in post rainy period and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Paddy, oil seeds
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nagaon district (6,204 ha)
Soil series associated	:	Kathiatali

Typifying pedon : Laokhowa loamy sand – cultivated.

Ap	0-19 cm	Light brownish grey (10YR 6/2 M) loamy sand; weak fine subangular blocky structure; very friable, non sticky and non plastic; many fine roots; slightly acid (pH 6.2); diffuse smooth boundary.
C1	19-32 cm	Light brownish grey (10YR 6/2 M) loamy sand; single grain structure; very friable, non sticky and non plastic; few fine roots; slightly acid (pH 6.5); diffuse smooth boundary.
C2	32-53 cm	Very dark grey (10YR 3/1) loamy sand; few fine faint yellowish brown (10YR 5/8 M) mottles; single grain structure; very friable non sticky and non plastic; few fine roots; slightly acid (pH 6.5); diffuse smooth boundary.
C3	53-84 cm	Dark brown (10YR 3/3 M) sandy loam; few fine faint dark yellowish brown (10YR 4/6) mottles; single grain structure; very friable, non sticky and non plastic; moderately acid (pH 6.0).

Range in characteristics : Laokhowa soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 6 and chroma 2 to 3. The texture is loamy sand. The structure is weak fine subangular blocks. The C horizon generally occur below 20 cm and has 3 or more subhorizons. Its colour is in the hue 10YR, value 3 to 6, chroma 1 to 3. High chroma mottles are observed below 30 cm depth. The texture is loamy sand or sand. There is no structural development in C horizon. The soils are slightly acid throughout the depth. The roots are concentrated at surface horizon and decreases in amount thereafter.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Mustard, cabbage, tomato, potato, beans, pea, cowpea	Moderately suitable	Coarse texture, low base saturation, low fertility
Wheat	Marginally suitable	Coarse texture, low base saturation, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-19	86.63	3.11	10.26			-
19-32	87.00	3.45	9.55			-
32-53	85.00	2.00	13.00			-
53-84	80.00	5.50	14.50			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-19	1.60	-	6.2	-
19-32	0.25	-	6.5	-
32-53	0.68	-	6.5	-
53-84	0.60	-	6.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-19	1.40	0.19	0.15	2.5	1.4	5.64	30.9	0.55
19-32	1.59	0.11	0.12	0.8	0.6	3.22	56.5	0.34
32-53	2.41	0.66	0.11	0.6	0.6	4.38	72.6	0.34
53-84	2.73	0.55	0.12	2.0	1.0	6.40	53.1	0.44

60. NAGAON SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Humic Endoaquept.*
Type location	:	26°20'00" N latitude, 92°40'42" E longitude, Village Borpukhri, district Nagaon, Assam.
Profile No.	:	83 B / GP 107
Physiographic position	:	Nearly level or very gently sloping low lands of the flood plains
Elevation (m)	:	50-60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2213 mm
Slope, erosion &relief	:	Nearly level or very gently sloping (0-1% slope),Very slightly eroded
Drainage & permeability	:	Poorly drained in rainy season, improves to well drained in post rainy period and Saturated hydraulic conductivity is moderately low
Land use and vegetation	:	Paddy, oil seeds
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nagaon district (11,157 ha)
Soil series associated	:	Dhing, Rupahi

Typifying pedon : Nagaon sandy clay loam – cultivated.

Ap	0-16 cm	Light grey (10YR 7/1 M) sandy clay loam; weak medium subangular blocky structure; very hard, firm, sticky and plastic; common, fine roots; moderately acid (pH 6.0); clear smooth boundary.
Bwg1	16-58 cm	Light grey to grey (10YR 6/1 M) sandy clay loam; many medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few, fine roots; moderately acid (pH 6.0); clear smooth boundary.
Bwg2	58-88 cm	Grey (10YR 5/1 M) clay loam; few medium faint brownish yellow (10 YR 6/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; slightly acid (pH 6.4); diffuse smooth boundary.
Cg	88-140 cm	Light grey to grey (10YR 6/1 M) clay loam; few, fine, faint yellowish brown (10YR 5/8) mottles; massive structure; firm, sticky and plastic; neutral (pH 6.8); diffuse smooth boundary.

Range in characteristics : Nagaon soils are very deep. The A horizon is 15 to 20 cm thick. Its colours is in the hue 10YR, value 5 to 7, and chroma 1 to 2. The texture is sandy clay loam or silty clay loam. The structure is weak or moderate, medium or coarse, subangular blocks. The B horizon is 60 to 80 cm thick and has two or more subhorizons. Its colours in the hue 10YR, value 4 to 6, chroma 1 to 2. It has many high chroma (10YR 6/8) mottles. The texture is sandy clay loam or clay loam. The structure is moderate, medium or coarse, subangular blocks. The C horizon is generally below 90 cm. Its colour is in the hue 10YR, value 5 to 7, chroma 1 to 2. It has few high chroma (10YR 5/8) mottles. The texture is clay loam or sandy clay loam. The C horizon has no structural development. These soils are moderately acid in the surface horizon and moderately or slightly acid in the subsoils.

It is even neutral below a depth of generally 100 cm. The roots are concentrated in the surface horizon and few roots are observed up to a depth of 50-70 cm.

Competing series and their differentiae : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Mustard, cabbage, tomato, potato, beans, pea, cowpea	Moderately suitable	Coarse texture, low base saturation, low fertility
Wheat	Marginally suitable	Coarse texture, low base saturation, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	61.8	11.5	26.7			
16-58	62.2	9.7	28.1			
58-88	41.8	25.5	32.7			
88-140	40.0	24.0	36.0			

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	1.90	-	6.0	-
16-58	1.11	-	6.0	-
58-88	0.56	-	6.4	-
88-140	0.32	-	6.8	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-16	1.70	0.34	0.22	3.3	1.9	7.46	30.3	0.28
16-58	2.44	0.48	0.13	3.2	1.6	7.85	38.8	0.28
58-88	5.15	0.48	0.13	1.5	0.9	8.11	71.0	0.25
88-140	5.65	0.39	0.16	1.2	0.8	8.20	75.6	0.23

Note: This sol classified under Humic subgroup giving importance to the low base saturation (30-39%) in the upper 50 cm, though the colour value of the surface horizon does not qualify. This is done keeping in view the use of the soil.

61. RUPAHI SERIES

Classification	:	Coarse loamy, mixed, hyperthermic family of *Aeric Fluvaquents.*
Type location	:	26°13'46" N Latitude, 92°30'0" E Longitude; Village Raha, district Nagaon, Assam.
Profile No.	:	83 B / GP 83
Physiographic position	:	Recent flood plains
Elevation (m)	:	50-60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2213 mm
Slope, erosion &relief	:	Nearly level or very gently sloping (0-1% slope), Very slightly eroded
Drainage & permeability	:	Poorly drained in rainy season, improves to well drained in post rainy period and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Paddy, mustard
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nagaon district (17,524 ha)
Soil series associated	:	Dhing, Nagaon

Typifying pedon : Rupahi sandy loam – cultivated.

Ap	0-16 cm	Grey (10YR 5/1 M) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and non plastic; many fine roots; moderately acid (pH 6.0); diffuse smooth boundary.
C1	16-36 cm	Dark grey (10YR 4/1 M) sandy loam; few, fine, distinct, dark yellowish brown (10YR 4/6) mottles; massive structure; very friable, non-sticky and non plastic; slightly acid (pH 6.5); diffuse smooth boundary.
C2	36-48 cm	Very dark grey (10YR 3/1 M) loamy sand; single grain structure; very friable, non sticky and non plastic; many, fine roots; slightly acid (pH 6.1); diffuse smooth boundary.
C3	48-72 cm	Brown (10YR 5/3 M) sandy loam; few medium distinct brownish yellow (10YR 6/8) mottles; single grain structure; very friable, non sticky and non plastic; few fine roots; slightly acid (pH 6.3); diffuse smooth boundary.
C4	72-125 cm	Brown (10YR 5/3 M) sandy loam; few medium distinct brownish yellow (10YR 6/6) mottles; single grain structure; very friable, non sticky and non plastic; moderately acid (pH 6.0); diffuse smooth boundary.

Range in characteristics : Rupahi soils are very deep. The A horizon is 15 to 20 cm thick. Its colours is in the hue 10YR, value 4 to 6, and chroma 1 to 2. The texture is sandy loam or loamy sand. The structure is weak, medium or fine, subangular blocks. The C horizon is below the depth 15 to 20 cm and has two or more subhorizons. Its colours in the hue 10YR, value 4 to 6, chroma 1 to 3. The texture is sandy loam or loamy sand with sand content of 77-80 percent. C horizons does not have structural development, present a massive appearance when wet and single grain when dry. These soils are moderately acid in the surface and slightly acid in the subsoil horizons. Many roots are

observed in the surface, the amount decreases through depth and no roots below a depth of generally 70 cm.

Competing series and their differentiae : Lahangaon series identified in Jorhat district and Jinjiram series idenfied in Goalpara district are competing series. The Lahangaon soils have pH of 7.4 to 7.9 and also traces of $CaCO_3$. Jinjiram soils have pH of 6.4 to 7.5. Both Lahangaon and Jinjiram series have sand content of 50 to 82 percent in control section.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture
Potato, mustard, cabbage	Suitable	No limitation
Tomato, beans, pea, cowpea	Moderately suitable	Coarse texture
Wheat	Marginally suitable	Coarse texture

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	78.50	9.01	12.49			-
16-36	81.3	7.1	11.60			-
36-48	81.8	8.3	9.9			-
48-72	78.9	9.8	11.3			-
72-125	77.9	9.4	12.7			-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	1.52	-	6.0	-
16-36	0.88	-	6.5	-
36-48	0.68	-	6.1	-
48-72	0.39	-	6.3	-
72-125	0.35	-	6.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-16	2.25	0.63	0.13	2.60	0.90	6.51	46.24	0.52
16-36	3.04	0.74	0.09	1.40	0.80	6.04	63.75	0.52
36-48	1.92	0.82	0.09	1.00	0.80	5.56	61.12	0.56
48-72	2.10	0.15	0.10	0.80	0.80	5.95	59.49	0.53
72-125	1.24	0.19	0.16	1.50	0.90	5.27	39.84	0.41

62. AMKATA SERIES

Classification	:	Fine, mixed hyperthermic family of *Typic Dystrudepts.*
Type location	:	26°07'02"N latitude, 92°16'28"E longitude; village Sitalajakhla, district Morigaon, Assam
Profile No.	:	83 B / 8 P2D
Physiographic position	:	Moderately sloping hill escarpments
Elevation (m)	:	55 m above MSL
Groundwater table	:	>10 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Moderately sloping (8-15% slope), moderately erosion
Drainage & permeability	:	Excessively drained and Saturated hydraulic conductivity is low
Land use and vegetation	:	Thin forest of Sal, Bamboo, teak, ajhar, and coarse tall grasses
Geology and parent material	:	Colluvium and/or granite-gneiss
Distribution and extent	:	Extensive in Morigaon district (4,610 ha)
Soil series associated	:	Dumria

Typifying pedon : Amkata sandy clay - forest.

A	0-22 cm	Dark reddish brown (5YR 3/3 M) sandy clay; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; common fine, medium and coarse roots; strongly acid (pH 5.5); gradual irregular boundary.
Bw1	22-54 cm	Dark reddish brown (5 YR 3/4 M) clay; moderate fine subangular blocky structure; friable, sticky and plastic; few medium and many fine roots; very strongly acid (pH 5.0); gradual irregular boundary.
Bw2	54-90 cm	Dark red (2.5YR 3/6 M) clay; moderate fine subangular blocky structure; friable sticky and plastic; few coarse and few fine roots; strongly acid (pH 5.2); clear irregular boundary.
BC	90-115 cm	Dark red (2.5YR 3/6 M) gravelly sandy clay loam; moderate fine subangular blocky structure; friable, sticky and non-plastic; very strongly acid (pH 4.9); gradual broken boundary.
C	115-150 cm	Dark red (2.5YR 3/6 M) gravelly sandy clay loam; weathered granite mixed with soil; strongly acid (pH 5.2).

Range in characteristics : The soils are deep. The thickness of the A horizon is about 15 to 25 cm. The colour is in hue 10YR to 5YR, value moist is 3 to 4 and chroma moist is 3 to 4. Texture is sandy clay to sandy clay loam. The B horizon is about 80 to 100 cm thick, the hue varies from 5YR to 2.5YR, value from 3 to 4 and chroma 4 to 6. The texture varies from sandy clay loam to clay. The C horizon generally is below 100 to 120 cm. Its colour is in the hue 2.5YR, value 3 to 5, chroma 4 to 6. The texture is sandy clay loam. It has 15-30 percent coarse fragments which increases with depth.

Interpetation : Amkata soils are heavy textured and moderately deep to deep on moderately sloping hill escarpments and are susceptible to erosion. These soils are otherwise protected by luxuriant vegetations. These soils have moderately high available moisture holding capacity.

Interpretative grouping :

i)	Land capability sub-class	VIIes
ii)	Irrigability sub-class	6t
iii)	Productivity potential	High

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-22	48.0	12.0	40.0	3.2	44.8	Nil
22-54	26.62	12.38	61.0	0.59	26.03	Nil
54-90	36.23	13.77	50.0	0.90	35.33	Nil
90-115	46.57	19.43 -	34.0	0.08	46.49	20
115-140	52.07	18.93	29.0	4.80	47.27	25

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-22	1.1	Nil	5.5	Nil
22-54	0.6	Nil	5.0	Nil
54-90	0.3	Nil	5.2	Nil
90-115	0.2	Nil	4.9	Nil
115-140	0.2	Nil	5.2	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-22	7.0	0.3	0.6	-	-	11.0	72	0.27
22-54	6.4	0.6	0.4	-	-	14.2	52	0.23
54-90	5.8	0.3	0.2	-	-	12.4	51	0.25
90-115	4.8	0.4	0.2	-	-	10.8	50	0.32
115-140	4.8	0.3	0.2	-	-	8.0	66	0.27

63. BARBHAGIA SERIES

Classification	:	Fine loamy over sandy, mixed, hyperthermic *Fluvaquentic Endoaquepts.*
Type location	:	26°20'11" N latitide, 92°17'48" E longitude; village Loubhanga, district Morigaon, Assam
Profile No.	:	83 B/7 P18
Physiographic position	:	Very gently sloping floodplain
Elevation (m)	:	70 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Poorly drained in reainy season, improves in post rainy periodand Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy, Natural vegetation :shimul ahat, imli, bamboo
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (20,708 ha)
Soil series associated	:	Morigaon, Haldibari, Mayang, Katani

Typifying pedon : Barbhagia clay loam - cultivated

Apg1	0-6 cm	Very dark grey (10YR 3/1 M) clay loam; weak fine sub-angular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; moderately acid (pH 5.6); gradual smooth boundary.
Apg2	6-16 cm	Black (10YR 2.5/1 M) clay; moderate medium subangular blocky structure; friable, sticky and plastic; few very fine roots; moderately acid (pH 6.0); gradual smooth boundary.
Bwg1	16-40 cm	Dark grey (7.5YR 4/0 M) clay; moderate medium subangular blocky structure; friable, sticky and plastic; few fine faint strong brown (7.5 YR 4/6) mottles; neutral (pH 6.9); gradual smooth boundary.
Bwg2	40-60 cm	Dark grey (10YR 4/1 M) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few fine faint dark yellowish brown (10YR 4/6) mottles; neutral (pH 7.1); abrupt smooth boundary.
2Cg1	60-110 cm	Dark grey (10YR 4.5/1 M) loamy sand; single grain; loose, non-sticky and non-plastic; few fine faint dark yellowish brown (10YR 4/6) mottles; neutral (pH 6.8); diffuse smooth boundary.
2Cg 2	110-135 cm	Grey (10YR 5/1 M) sandy loam; structureless; loose, non-sticky and non-plastic; few fine distinct strong brown (7.5YR 5/6) mottles; neutral (pH 6.7).

Range in characteristics : The Barbhagia soils are very deep. Thickness of the A horizon ranges from 11 to 16 cm. The colour is in hue 10YR, value 3 to 4, chroma 1 to 2. Its texture varies from silty loam to clay loam. The thickness of B horizons ranges from 40 to 70 cm, the hue varies from 7.5YR to 10YR, value 2 to 4, chroma 1 to 2. Its texture varies from silty clay loam to clay loam. The C horizon appears below depth of 50 to 75 cm. The hue varies from 10YR to 2.5Y, value 4 to 5, chroma 1 to 2. The texture is sandy loam or loamy sand.

Competing series and their differentiae : No competing series is identified.

Interpretation : Barbhagia soils are fine textured with coarse textured subsurface horizons starting from 50 to 100 cm. These soils occur in low lying areas and are imperfectly drained and are subjected to hydromorphic conditions. Water stagnation in these soils are common during rainy season due to high ground water table. These soils are suitable for paddy cultivation.

Interpretative grouping :

i)	Land capability sub-class	IIw
ii)	Irrigability sub-class	2ds
iii)	Productivity potential	High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low fertility
Wheat, cabbage, mustard, tomato, beans, pea, cowpea	Moderately suitable	Low pH, low fertility
Potato	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-6	36.0	33.5	30.5	10.1	25.9	Nil
6-16	26.5	32.0	41.5	7.0	19.5	Nil
16-40	29.0	31.0	40.0	8.4	20.6	Nil
40-60	30.8	41.7	27.5	8.8	22.0	Nil
60-110	80.7	10.3	9.0	18.9	61.8	Nil
110-135	75.5	15.0	9.5	29.2	46.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-6	1.9	Nil	5.6	Nil
6-16	1.6	Nil	6.0	Nil
16-40	0.4	Nil	6.9	Nil
40-60	0.3	Nil	7.1	Nil
60-110	0.1	Nil	6.8	Nil
110-135	0.2	Nil	6.7	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-6	11.2	1.0	0.2	-	-	12.8	97	0.42
6-16	14.2	0.9	0.1	-	-	15.6	97	0.37
16-40	11.2	0.7	0.1	-	-	12.8	94	0.32
40-60	11.0	0.8	0.1	-	-	12.0	99	0.44
60-110	2.9	0.6	-	-	-	3.6	97	0.40
110-135	3.6	0.6	-	-	-	4.3	98	0.45

Note: The texture up to the depth of 60 cm was given preference in placing this series in fine-loamy class. However, the textural class is coarse loamy below the depth of 60 cm.

64. DHARAMTUL SERIES

Classification	:	Fine, mixed, hyperthermic *Aeric Endoaquepts.*
Type location	:	26°10'24"N latitude, 92°23'52"E longitude; village Dharamtul, district Morigaon, Assam
Profile No.	:	83 B / 8 P87
Physiographic position	:	Nearly level uplands
Elevation (m)	:	50 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Nearly level (0-1%), slightly eroded
Drainage & permeability	:	Imperfectly to poorly drained in reainy season, improves in post rainy periodand Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy,
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (2,184 ha)
Soil series associated	:	Mayang

Typifying pedon : Dharamtul clay – cultivated.

Ap	0-10 cm	Dark grey (10YR 4/1 M) clay; moderate medium subangular blocky structure; firm, sticky and plastic; very fine to fine common roots; root mottles; very strongly acid (pH 4.5); clear wavy boundary.
Bw1	10-28 cm	Dark greyish brown (10YR 4/2 M) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few very fine, fine roots; few fine distinct reddish brown (5YR 4/4) mottles; extremely acid (pH 4.4); clear smooth boundary.
Bw2	28-40 cm	Very dark greyish brown (10YR 4/2 M) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine distinct, strong brown (7.5 YR 5/6) mottles; very strongly acid (pH 4.5); gradual smooth boundary.
Bw3	40-80 cm	Brown (10YR 5/3 M) clay; moderate medium subangular blocky structure; firm, sticky and plastic; common medium iron concretions; many coarse prominent red (2.5YR 4/8) mottles; extremely acid (pH 4.0); gradual smooth boundary.
Bw4	80-160 cm	Yellowish brown (10YR 5/6 M) clay; moderate medium subangular blocky structure; very firm, sticky and plastic; many fine iron concretions; many coarse prominent red (2.5YR 4/5) mottles; very strongly acid (pH 4.7).

Range in characteristics : The thickness of the solum ranges from 140 to 150 cm or more. Thickness of A horizons is 10 to 12 cm; the colour is in hue 10YR, value 4, and chroma 1 to 2. Its texture is clay or silty clay. The thickness of B Horizon ranges from 140-150 cm. Its colour is in hue 10YR or 2.5Y, value 4 to 6, chroma 2 to 4; the texture is clay. The structure is moderate or strong, medium or coarse subangular blocky. Roots are distributed up to a depth of 30 cm.

Competing series and their differentiae : Khowang series identified in Dibrugarh district is competing soil series. Khowang soils have a pH of 4.9 in the surface horizon and 6.3 to 6.8 in the control section. The base saturation is above 80 percent.

Interpretation : These soils are heavy textured with high water holding capacity. These soils have problems of drainage due to water table and the lower topographic position.

Interpretative grouping :

i)	Land capability sub-class	IIw
ii)	Irrigability sub-class	2sd
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low fertility
Wheat, cabbage, mustard, pea, potato,tomato, beans, cowpea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-10	8.2	18.8	73.0	2.3	5.9	Nil
10-28	16.7	14.8	68.5	3.6	13.1	Nil
28-40	24.9	15.1	60.0	4.7	20.2	Nil
40-80	22.2	16.8	61.0	9.6	12.6	Nil
80-160	19.6	17.9	62.5	3.0	16.6	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-10	1.6	Nil	4.5	Nil
10-28	1.0	Nil	4.4	Nil
28-40	0.6	Nil	4.5	Nil
40-80	0.2	Nil	4.0	Nil
80-160	0.1	Nil	4.7	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-10	6.4	0.4	0.3	NA	NA	18.6	38	0.25
10-28	4.0	0.4	0.2	-	-	14.0	33	0.20
28-40	3.0	0.4	0.2	-	-	8.2	44	0.14
40-80	1.6	0.4	0.2	-	-	7.8	28	0.13
80-160	3.0	0.4	0.2	-	-	8.0	45	0.13

65. DIGHALBARI SERIES

Classification	:	Fine loamy, mixed, hyperthermic *Typic Endoaquepts.*
Type location	:	26°18'10" N latitude, 92°18'29" E longitude; village Rupahigaon, district Morigaon, Assam
Profile No.	:	83 B / 7 P22
Physiographic position	:	Gently sloping alluvial uplands
Elevation (m)	:	50 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Imperfectly to poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy, Natural vegetation :bamboo, shimul, ahat
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Nagaon (53,148 ha), Morigaon (16,726 ha) districts
Soil series associated	:	Morigaon, Katani, Haldibari, Barbhagia ,

Typifying pedon : Dighalbari clay loam - cultivated

Apg	0-15 cm	Dark grey (10YR 4/1 M) clay loam; weak medium subangular blocky structure; very friable, sticky and nonplastic; common fine roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bwg1	15-40 cm	Dark grey (2.5Y 4/0 M) clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; few fine roots; few fine faint dark brown (7.5YR 4/4) mottles; neutral (pH 6.8); gradual wavy boundary.
2Bwg2	40-65 cm	Dark grey (10YR 4/1 M) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine distinct strong brown (7.5YR 5/6) mottles; neutral (pH 6.9); clear smooth boundary.
2C1	65-145 cm	Dark greyish brown (10YR 4.5/2 M) sandy loam; structureless; friable, non-sticky and non plastic; common fine distinct strong brown (7.5YR 5/6) mottles; neutral (pH 6.7); gradual smooth boundary.
3C2	145-180 cm	Brown (10YR 4/3 M) sand; single grain structure; loose, non sticky and non plastic; neutral (pH 7.1).

Range in characteristics : The Dighalbari soils are very deep. The thickness of A horizon ranges from 11 to 20 cm. Its colour is in hue of 10YR and value 3 to 4, chroma 1 to 2. The texture is clay loam. The thickness of B horizon ranges from 45 to 80 cm. Its colour is in hue of 10YR to 2.5Y, value 4 to 5, chroma 0 to 2 and the texture varies from sandy clay loam to clay loam. The C horizon occurs below 60-100 cm depth. Its colour is in hue of 10YR to 2.5Y, value 3 to 4, chroma 0 to 3. The texture varies from sandy loam to sand.

Interpretation : Dighalbari soils are fine loamy over loamy sand to sand appearing around 50 to 65 cm. These soils are imperfectly drained due to high water table. These soils occur in low lands and are inundated by flood water during rainy season.

Interpretative grouping :

i)	Land capability sub-class	IIw
ii)	Irrigability sub-class	2sd
iii)	Productivity potential	High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low organic matter, low fertility
Wheat, cabbage	Moderately suitable	Low organic matter, low pH, coarse texture, low water availability
Mustard, potato, pea, beans, tomato, cowpea	Marginally suitable	Low pH, low organic matter, low fertility, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	29.1	38.4	32.5	6.2	22.9	Nil
15-40	32.5	38.0	29.5	5.2	27.3	Nil
40-65	55.9	23.6	20.5	14.8	41.1	Nil
65-145	68.2	21.8	10.0	10.3	57.9	Nil
145-180	90.8	2.7	6.5	3.9	86.9	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.4	Nil	5.0	Nil
15-40	0.4	Nil	6.8	Nil
40-65	0.3	Nil	6.9	Nil
65-145	0.1	Nil	6.7	Nil
145-180	0.1	Nil	7.1	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	8.6	0.4	0.2	-	-	12.8	72	0.39
15-40	9.3	0.6	0.1	-	-	10.2	98	0.34
40-65	8.8	0.6	-	-	-	9.6	98	0.47
65-145	6.6	0.5	-	-	-	7.4	96	0.74
145-180	3.6	0.4	-	-	-	4.0	100	0.61

Note: The texture up to the depth of 65 cm is given preference in placing this series in fine loamy class. However, the textural class below 65 cm in coarse loamy.

66. DUMRIA SERIES

Classification	:	Loamy, mixed, hyperthermic, family of *Lithic Dystrudepts*.
Type location	:	26°14'42"N latitude, 92°47"E longitude; village Buramayang, district Morigaon, Assam
Profile No.	:	83 B / 8 P45
Physiographic position	:	Moderately sloping highly dissected escarpments on the western hilly border of Morigaon district
Elevation (m)	:	120 m above MSL
Groundwater table	:	>10 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Moderately sloping
Drainage & permeability	:	Excessively drained and Saturated hydraulic conductivity is low
Land use and vegetation	:	Moderately dense forest fully stocked with sal, teak, shimul etc
Geology and parent material	:	Weathered granite gneiss
Distribution and extent	:	Extensive in Morigaon district (1,138 ha)
Soil series associated	:	Amkata

Typifying pedon : Dumria loam - forest.

A	0-19 cm	Very dark grayish brown (10YR 3/2 M) loam; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few coarse and many very fine and fine roots; moderately acid (pH 5.6); gradual smooth boundary.
Bw1	19-35 cm	Reddish brown (5YR 4/4 M) gravelly clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; gneissic fragments 25-30% by volume; few coarse and many very fine and fine roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bw2	35-48 cm	Reddish brown (5YR 4/4 M) gravelly clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; gneissic fragments 25-30% by volume; few coarse and many very fine and fine roots, moderately acid (pH 5.9); clear smooth boundary.
R	48 cm	Hard granite gneiss rock.

Range in characteristics : The soils are shallow. The thickness of the A horizon is about 10 to 19 cms. The colour is in hue 7.5YR to 10YR, value moist is 3 to 4 and chroma moist is 3. Texture is loam to clay loam. The B horizon is about 20 to 30 cm thick, the hue ranges from 7.5YR to 5YR, value from 4 and chroma 4. The texture is sandy clay loam or clay loam. The structure is weak or moderate medium subangular blocky. Gneissic fragments (20-30 %) are observed in the horizon between 15 and 50 cm (or lithic contact).

Interpetation : Dumria soils are shallow and medium textured on moderately sloping highly dissected escarpments and are susceptible to erosion. Soil and water conservation measures are necessary. These soils have low to medium moisture holding capacity.

Interpretative grouping :

i)	Land capability sub-class	VIIes
ii)	Irrigability sub-class	6ts
iii)	Productivity potential	Medium.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-19	46.6	32.4	21.0	1.8	44.8	Nil
19-35	44.1	27.4	28.5	1.2	42.9	20
35-48	43.8	22.2	34.0	1.4	42.4	25

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-19	1.1	Nil	5.6	Nil
19-35	0.7	Nil	5.0	Nil
35-48	0.6	Nil	5.9	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-19	5.0	0.3	0.2	NA	NA	6.0	92	0.28
19-35	3.0	0.4	0.2	-	-	4.5	80	0.16
35-48	3.2	0.4	0.3	-	-	5.2	75	0.15

67. HALDIBARI SERIES

Classification	:	Fine loamy, mixed, hyperthermic *Fluvaquentic Endoaquepts.*
Type location	:	26°23'26"N latitude, 92°21'50"E longitude; village Dahabari, district Morigaon, Assam.
Profile No.	:	83 B / 7 P16
Physiographic position	:	Very gently sloping alluvial floodplain in the central part of Morigaon district
Elevation (m)	:	50-60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Moderately sloping
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy, Natural vegetation :shimul, kadam, ahat
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (12,428 ha)
Soil series associated	:	Morigaon, Barbhagia, Katani, Dighalbari,

Typifying pedon : Haldibari sandy loam - cultivated

Apg1	0-10 cm	Dark grey (10YR 4.5/1 M) sandy loam; weak fine subangular blocky structure; friable, slightly sticky and non plastic; few fine roots; root mottles; moderately acid (pH 5.6); gradual smooth boundary.
Apg2	10-17 cm	Very dark grey (10YR 3.5/1 M) sandy clay loam; moderate medium subangular blocky; friable, slightly sticky and non-plastic; few fine roots; many root mottles; neutral (pH 6.8); gradual smooth boundary.
2Bwg1	17-31 cm	Very dark grey (10YR 3/1 M) clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; neutral (pH 6.7); gradual smooth boundary.
2Bwg2	31-57 cm	Greyish brown (2.5Y 5/2 M) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; common, fine, distinct yellowish brown (10YR 5/6) mottles, neutral (pH 7.0); gradual smooth boundary.
3Bwg3	57-97 cm	Greyish brown (2.5Y 5/2 M) sandy loam; moderate, medium, subangular blocky structure; friable, slightly sticky and non-plastic; neutral (pH 7.1); abrupt smooth boundary.
3C	97-135 cm	Greyish brown (2.5Y 5/2 M) sandy loam; structureless; loose, nonsticky and nonplastic; neutral (pH 7.1).
	135 cm+	Water table.

Range in characteristics : Haldibari soils are very deep. The thickness of A horizon ranges from 10 to 20 cm. The colour is in hue of 10YR, value 3 to 4.5, chroma 1 to 2. The thickness of B horizons ranges from 80 to 120 cm. The hue ranges from 10YR to 2.5Y, value 3 to 5, chroma 1 to 2. The texture is clay loam or loam or sandy loam. The C horizon is sandy and appears at a depth of 120 cm or below. The water table is observed at a depth of 135 cm and it fluctuates with season.

Competing series and their differentiae : The Ambari series identified in Kamrup district and Kaziranga series identified in Golaghat district are competing for the taxonomic position. Ambari soils have sand content up to 71 %. Kaziranga soils are mostly under grass land and remain waterlogged for longer period.

Interpretation : Haldibari soils occur in low lying areas causing the problem of soil-air relationship. Water stagnation during rainy season is common in these soils due to high ground water table. These soils are suitable for paddy cultivation.

Interpretative grouping :

i)	Land capability sub-class	IIIw
ii)	Irrigability sub-class	2sd
iii)	Productivity potential	High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low organic matter, low pH, low fertility
Mustard, potato, cabbage	Moderately suitable	Low pH, low organic matter, low fertility
Wheat, pea, beans, tomato, cowpea	Marginally suitable	Low pH, low organic matter, low fertility, low water availability

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-10	64.7	15.3	20.0	11.8	52.9	Nil
10-17	63.5	12.0	24.5	10.4	53.1	Nil
17-31	43.7	21.3	35.0	10.9	32.8	Nil
31-57	42.9	21.1	36.0	8.1	34.8	Nil
57-97	60.0	21.0	19.0	12.6	47.4	Nil
97-135	63.0	19.0	18.0	16.4	46.6	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-10	0.9	Nil	5.6	Nil
10-17	0.5	Nil	6.8	Nil
17-31	0.9	Nil	6.7	Nil
31-57	0.3	Nil	7.0	Nil
57-97	0.2	Nil	7.1	Nil
97-135	0.1	Nil	7.1	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-10	6.0	0.3	0.1	-	-	7.0	91	0.35
10-17	8.0	0.3	0.1	-	-	9.2	91	0.37
17-31	10.4	0.3	0.1	-	-	11.8	91	0.34
31-57	10.0	0.3	0.1	-	-	11.6	90	0.32
57-97	9.2	0.3	0.1	-	-	10.0	96	0.53
97-135	-	-	-	-	-	-	-	-

68. KAPILI SERIES

Classification	:	Fine, mixed, hyperthermic *Vertic Endoaquepts.*
Type location	:	26°14'18"N latitude, 92°22'53"E longitude; village Sholmarigaon, district Morigaon, Assam.
Profile No.	:	83 B /8 P25
Physiographic position	:	Very gently sloping floodplain with left out channels and marshes and swamps in the southern part of Morigaon district
Elevation (m)	:	60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy, Natural vegetation :shimul, bamboo, grasses
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (9,598 ha)
Soil series associated	:	Matikhola

Typifying pedon : Kapili clay - cultivated

Ap1	0-10 cm	Very dark greyish brown (10YR 3/2 M) clay; moderate medium subangular blocky structure; firm, sticky and plastic; many fine roots; root mottles; 4 to 5 cm wide cracks; very strongly acid (pH 5.0); gradual smooth boundary.
Ap2	10-20 cm	Very dark grey (10YR 3/1 M) silty clay; weak, very coarse prismatic structure breaking into strong, medium and strong coarse subangular and angular blocky structure; very firm, very sticky and very plastic; common fine roots; root mottles; 2-3 cm wide cracks; slightly acid (pH 6.4); abrupt irregular boundary.
Bwg1	20-47 cm	Dark grey (10YR 4/1 M) clay; weak, very corse, prismatic structure forming wedge shaped aggregates breaking into strong medium and strong coarse subangular blocky structure; very firm, very sticky and very plastic; few fine roots; few fine distinct yellowish brown (10YR 5/6) mottles; 1 to 2 cm wide cracks; neutral (pH 7.0); gradual smooth boundary.
Bwg2	47-98 cm	Dark grey (10YR 4/1 M) clay; weak, very coarse prismatic structure forming wedge shaped aggragatges breaking into strong medium and strong coarse subangular blocky and angular blocky structure; very firm, very sticky and very plastic; common medium distinct strong brown (7.5YR 5/6) mottles; 1 to 2 cm wide cracks; neutral (pH 6.8); gradual smooth boundary.
Bw3	98-123 cm	Dark yellowish brown (10YR 4/4 M) clay; weak very coarse prismatic structure; wedge shaped aggragatges breaking into strong medium and strong coarse subangular blocky and angular blocky structure; very firm, very sticky and very plastic; common medium prominent grey (10YR 6/1) mottles; 1 cm wide cracks; neutral (pH 6.6); gradual smooth boundary.
Cg1	123-173 cm	Grey (10YR 6/1 M) loam; weak, very coarse, prismatic structure forming wedge shaped breaking into strong medium and strong coarse subangular blocky and angular blocky structure; very firm, very sticky and very plastic; common medium prominent reddish brown (5YR 4/4) mottles; neutral (pH 6.6); gradual smooth boundary.
Cg2	173-200 cm	Grey (10YR 5/1 M) silt loam; strong, coarse, angular blocky and moderate medium, subangular blocky structure forming wedge shaped aggregates; firm, very sticky and very plastic; few medium prominent red (2.5YR 4/6) mottles; moderately acid (pH 5.9).

Range in characteristics : The Kapili soils are very deep. The thickness of A horizon ranges from 11 to 20 cm. The colour is in hue of 10YR to 2.5Y, value 3 to 5, chroma 1 to 2. The texture ranges from silty clay to clay. The B horizon is about 100 to 120 cm thick. Its colour is in hue of 10YR to 2.5Y, value 3 to 6, chroma 1 to 4, but mostly limited to 1 or 2 in the upper 75 cm. The C horizon is generally observed below 120 cm depth. Its colour is in the hue 10YR, value 4 to 6, chroma 1 to 2. The texture is loam or silt loam.

Competing series and their differentiae : Katani series identified in the same district is competing. Katani soils have a clay content of 35 to 43% and a sand conent of 7 to 22 percent in the upper 75 cm.

Interpretation : Kapili soils are heavy textured underlain by relatively silty layers. These soils occur mostly on low lying areas along leftout channels now appearing as oxbow lakes. Water table within 1 to 2 m depth results in very poor drainage and hence soil-air relationship. Deep and wide cracks appear during December, January and February months. These soils are suited for rice.

Interpretative grouping :

i)	Land capability sub-class	IIIw
ii)	Irrigability sub-class	3ds
iii)	Productivity potential	High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-10	37.2	19.3	43.5	3.0	34.2	Nil
10-20	13.1	40.9	46.0	2.2	10.9	Nil
20-47	15.8	31.2	53.0	0.6	15.2	Nil
47-98	15.9	22.1	62.0	0.2	15.7	Nil
98-123	18.3	34.7	47.0	2.4	15.9	Nil
123-175	24.7	49.3	26.0	7.2	17.5	Nil
175-200	7.1	67.4	25.5	1.7	5.4	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-10	1.9	Nil	5.0	Nil
10-20	1.1	Nil	6.4	Nil
20-47	0.3	Nil	7.0	Nil
47-98	0.3	Nil	6.8	Nil
98-123	0.3	Nil	6.6	Nil
123-175	0.3	Nil	6.6	Nil
175-200	0.3	Nil	5.9	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-10	9.7	0.3	0.1	NA	NA	21.6	47	0.50
10-20	21.8	0.8	0.2	-	-	23.2	98	0.50
20-47	20.8	0.6	0.1	-	-	22.6	95	0.43
47-98	19.8	0.8	0.1	-	-	21.6	96	0.35
98-123	24.2	0.7	0.2	-	-	27.6	91	0.59
123-175	16.4	0.6	0.1	-	-	18.0	95	0.69
175-200	10.6	0.3	0.1	-	-	13.8	80	0.54

69. KATANI SERIES

Classification	:	Fine, mixed, hyperthermic family of *Vertic Endoaquepts.*
Type location	:	26°25'32" N latitude, 92°21'43" E longitude; village Barbari, district Morigaon, Assam.
Profile No.	:	83 B / 7 P36
Physiographic position	:	Very gently sloping floodplain with marshes and swamps in a limited patch of Morigaon district
Elevation (m)	:	50 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Jute, pulses, vegetables
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (14,050 ha)
Soil series associated	:	Dighalbari, Haldibari, Barbhagia,

Typifying pedon : Katani silt loam - cultivated

Ap	0-9 cm	Dark greyish brown (10YR 4.5/2 M) silt loam; medium moderate subangular blocky structure; friable, sticky and slightly plastic; few very fine roots; root mottles; moderately acid (pH 5.8); clear smooth boundary.
Bw1	9-20 cm	Very dark greyish brown (10YR 3/2 M) silty clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; few very fine roots; more than 1 cm wide cracks, few fine faint brown (7.5YR 4.5/4) mottles; slightly acid (pH 6.1); gradual smooth boundary.
Bw2	20-37 cm	Dark greyish brown (10YR 4/2 M) silty clay; strong coarse angular blocky structure forming wedge shaped aggragatges breaking into medium moderate subangular blocky structure; firm, very sticky and very plastic; few coarse roots; more than 1 cm wide cracks; few fine faint brown (7.5YR 4.5/4) mottles; neutral (pH 6.9); clear smooth boundary.
Bw3	37-75 cm	Dark brown (10YR 4/3 M) silty clay loam; strong coarse angular blocky structure; wedge shaped aggragatges breaking into medium moderate subangular blocky structure; firm, very sticky and very plastic; more than 1 cm wide cracks; few fine faint brown (7.5YR 4.5/4) mottles; neutral (pH 7.2); gradual smooth boundary.
Bw4	75-100 cm	Dark brown (10YR 4/3 M) silt loam; medium coarse subangular blocky structure; friable, sticky and slightly plastic; neutral (pH 7.0); gradual smooth boundary.
C1	100-125 cm	Dark yellowish brown (10YR 4/3.5 M) silt loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; neutral (pH 7.1); abrupt smooth boundary.
2C2	125-150 cm	Dark brown (10YR 4/3 M) loamy sand; single grain structure; loose, non sticky and non plastic; neutral (pH 7.3).

Range in characteristics : The Katani soils are very deep. The thickness of A horizon ranges from 9-16 cm. Its colour is in hue of 10YR, value 3 to 5, chroma 1 to 2. Texture varies from silty loam to silty clay loam. The thickness of B horizon ranges from 70 to 100 cm. Its colour is in hue of 10YR, value 4 to 5, chroma 2 to 3. The texture varies from silty clay loam to silty clay. The C horizon is observed generally below 100 cm depth. Its colour is in hue of 10YR, value 4 to 5, chroma 2 to 3. The texture varies from loamy sand to silt loam.

Competing series and their differentiae : Kapili series identified in the same district is competing. Kapili has a clay content of 43-62 % through the depth.

Interpretation : Katani soils are finer textured over loamy sand to sand which appears around 100 to 125 cm depth. These soils occur on imperfectly drained low lying lands subject to hydromorphic conditions. As a result, they are suited for only to rice. Deep and wide cracks appear during January and February months.

Interpretative grouping :

1. Land capability sub-class : IIw
2. Irrigability sub-class : 2ds
3. Productivity potential : High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low organic matter, low fertility
Wheat, potato, cabbage	Moderately suitable	Low organic matter, low fertility
Pea, mustard, beans, tomato, cowpea	Marginally suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-9	22.4	51.1	26.5	11.0	11.4	Nil
9-20	17.8	54.2	28.0	7.3	10.5	Nil
20-37	7.1	49.4	43.5	3.6	3.5	Nil
37-75	7.0	58.5	34.5	3.7	3.3	Nil
75-100	9.1	67.9	23.0	4.9	4.2	Nil
100-125	14.8	66.7	18.5	6.6	8.2	Nil
125-150	82.8	8.7	8.5	28.4	54.4	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-9	0.8	Nil	5.8	Nil
9-20	0.7	Nil	6.1	Nil
20-37	0.7	Nil	6.9	Nil
37-75	0.4	Nil	7.2	Nil
75-100	0.3	Nil	7.0	Nil
100-125	0.2	Nil	7.1	Nil
125-150	0.1	Nil	7.3	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-9	7.0	0.3	0.1	NA	NA	9.2	80	0.35
9-20	8.2	0.3	0.1	-	-	10.0	86	0.36
20-37	13.1	0.4	0.1	-	-	13.8	99	0.32
37-75	11.8	0.3	0.1	-	-	13.2	92	0.38
75-100	12.2	0.3	0.1	-	-	13.0	97	0.56
100-125	9.6	0.3	0.1	-	-	10.4	96	0.56
125-150	6.0	0.2	0.1	-	-	7.6	83	0.89

Note: This series is placed in fine textural family considering the texture in major part of the control section.

70. KUMARKUCHI SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Aeric Endoaquepts*.
Type location	:	26°06'11" N latitude, 92°16'17" E longitude; village Kumarkuchi. district Morigaon, Assam
Profile No.	:	83 B / 8 P16
Physiographic position	:	Level to nearly level uplands
Elevation (m)	:	70-80 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Level to Very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Imperfect to Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy. Natural vegetation : sal, shimul
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (3,276 ha)
Soil series associated	:	Bhaluka.

Typifying pedon : Kumarkuchi silty clay loam - cultivated

Ap	0-16 cm	Very dark greyish brown (10YR 3/2 M) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; many fine roots; very strongly acid (pH 4.8); clear smooth boundary.
Bw1	16-24 cm	Dark brown (10 YR 4/3 M) silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common medium faint strong brown (7.5YR 5/6) mottles; strongly acid (pH 5.2); gradual smooth boundary.
Bw2	24-57 cm	Dark greyish brown (10YR 4/2 M) silty clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; few fine roots; few fine faint dark brown (7.5YR 4/4) mottles; strongly acid (pH 5.3); gradual smooth boundary.
2Bw3	57-97 cm	Greyish brown (10YR 5/2 M) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; many, coarse, prominent dark reddish brown (5YR 3/4) mottles, moderately acid (pH 6.0); gradual smooth boundary.
2Bw4	97-122 cm	Dark yellowish brown (10YR 4/4 M) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; many coarse prominent dark reddish brown (5YR 3/4) mottles; moderately acid (pH 6.0); gradual smooth boundary.
2Bw5	122-150 cm	Greyish brown (10YR 5/2M) clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many coarse prominent reddish brown (5YR 4/4) mottles; moderately acid (pH 6.0).

Range in characteristics : Kumarkuchi soils are very deep. Thickness of the Ap horizon varies from about 11 to 20 cm; the colour is in hue 10YR, value 3 to 5 and chroma 1 to 2; texture is silty clay

loam or silt loam. The B horizons is about 100-140 cm thick. The colour is in hue from 10YR or 2.5Y, value 4 to 6 and chroma 2 to 4 with dark brown or dark reddish brown mottles. The texture is silty clay loam or clay loam. The structure is moderate medium or coarse, subangular blocky. Roots are distributed upto 60 cm depth.

Competing series and their differentiae : Titabar series identified in Jorhat district, Dhing series identified in Nagaon district and Habilagaon series identified in Kamrup district are competing series. Titabar soils have sand content of 22-25% below 50 cm depth. They have a pH of 5.2 to 5.5 through depth. Dhing soils have sand content of less than 5% below 50 cm depth. They have pH of 6.6 to 7.3 through depth. Habilagaon soils have clay content of 32-53% in the upper 50 cm. They have pH of 6.4 to 7.8 through depth.

Interpetation : These soils have problems of drainage due to high water table and remain partially water logged due to seasonal flooding.

Interpretative grouping :

i)	Land capability sub-class	IIw
ii)	Irrigability sub-class	2sd
iii)	Productivity potential	Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low fertility
Wheat, cabbage, mustard, potato, tomato, beans, pea, cowpea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	3.4	61.0	35.6	0.8	2.6	Nil
16-24	5.9	59.1	35.0	0.9	5.0	Nil
24-57	14.3	50.5	35.2	1.0	13.3	Nil
57-97	42.9	28.1	29.0	3.0	39.9	Nil
97-122	44.9	25.1	30.0	2.2	42.7	Nil
122-150	44.4	28.1	27.5	3.2	41.2	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	2.1	Nil	4.8	Nil
16-24	0.8	Nil	5.2	Nil
24-57	0.7	Nil	5.3	Nil
57-97	0.2	Nil	6.0	Nil
97-122	0.2	Nil	6.0	Nil
122-150	0.2	Nil	6.0	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-16	4.0	0.3	0.1	NA	NA	11.4	39	0.32
16-24	4.4	0.2	0.1	-	-	12.0	39	0.32
24-57	4.4	0.2	0.1	-	-	12.2	38	0.33
57-97	4.2	0.2	0.1	-	-	7.8	58	0.27
97-122	5.0	0.2	0.1	-	-	7.6	70	0.25
122-150	4.4	0.2	0.1	-	-	7.8	60	0.28

Note: The textural class of the soil up to a depth of 57 cm is given preference and therefore it is fine-silty.

71. MAYANG SERIES

Classification	:	Coarse-loamy, mixed, hyperthermic *Fluvaquentic Endoaquepts.*
Type location	:	26°14'45"N latitude, 92°03'04"E longitude; village Mayang, district Morigaon, Assam
Profile No.	:	83 B / 4 P47
Physiographic position	:	Very gently sloping alluvial floodplain in the north western part of Morigaon district
Elevation (m)	:	60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Very gently sloping 91-3% slope), slight erosion
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy. Natural vegetation : sal, shimul
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (4,962 ha)
Soil series associated	:	Dharamtul, Kumarkuchi , Barbhagia ,

Typifying pedon : Mayang silt loam - cultivated

Ap	0-12 cm	Greyish brown (2.5Y 5/2 M) silt loam; weak medium subangular blocky structure; friable, slightly sticky and non plastic; many very fine, fine roots; root mottles; slightly acid (pH 6.1); clear smooth boundary.
Bw1	12-36 cm	Greyish brown (2.5Y 5/2 M) silt loam; weak medium subangular blocky structure; friable, slightly sticky and non plastic; common very fine and fine roots; few fine distinct yellowish brown (10YR 5/6) mottles; neutral (pH 7.0); gradual smooth boundary.
Bw2	36-54 cm	Greyish brown (2.5Y 5/2 M) sandy loam; moderate medium subangular blocky structure; friable, slightly sticky and non-plastic; few very fine and fine roots; few distinct dark yellowish brown (10YR 4/4) mottles; neutral (pH 7.0); gradual smooth boundary.
Bw3	54-115 cm	Greyish brown (2.5Y 5/2 M) silt loam; moderate medium subangular blocky structure; friable, slightly sticky and non-plastic; few medium distinct dark yellowish brown (10YR 4/4) mottles; neutral (pH 7.2); gradual smooth boundary.
Bw4	115-130 cm	Olive (5Y 5/3 M) silty clay loam; strong medium subangular blocky structure; sticky and plastic; few medium distinct dark yellowish brown (10YR 4/6) mottles; slightly alkaline (pH 7.4); clear smooth boundary.
Bw5	130-155 cm	Greyish brown (2.5Y 5/2 M) silty clay loam; strong medium subangular blocky structure; sticky and plastic; few medium distinct yellowish brown (10YR 5/6) mottles; slightly alkaline (pH 7.4); gradual smooth boundary.
Bw6	155-180 cm	Greyish brown (2.5Y 5/2 M) silt loam; strong medium subangular blocky structure; sticky and slightly plastic; few medium distinct dark yellowish brown (10YR 4/6) mottles; slightly alkaline (pH 7.4).

Range in characteristics: Mayang soils are very deep. The thickness of the A horizon varies from 12 to 20 cm. The colour is in hue of 2.5Y or 10YR, value 4 to 5, chroma 2 to 3. The texture is loam to silt loam. The thickness of B horizon ranges from 135 to 160 cm. Its colour is in hue of 10YR or 2.5Y or 5Y, value 4 to 5 and chroma 1 to 2. The texture is silty clay loam or silty loam. The structure is moderate or strong medium subangular blocky. High chroma mottles are distributed through the pedon. Roots are distributed up to a depth of 50 cm.

Interpretation: Mayang soils show multiple depositional sequence in the horizons. Field observations and laboratory data indicate that the relatively coarse textured A horizons are colluvial in nature while the heavy textured C horizons are alluvial in nature. High silt content in C horizons further confirm this. These soils have problems of drainage due to high water table. Seasonal flooding makes these soils partially waterlogged.

Interpretative grouping :

i)	Land capability sub-class	IIIw
ii)	Irrigability sub-class	2ds
iii)	Productivity potential	High

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, coarse texture, low fertility
Wheat, potato, cabbage, mustard, tomato, beans, pea, cowpea	Marginally suitable	Low organic matter, coarse texture, low water availability, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-12	5.8	77.2	17.0	3.4	2.4	Nil
12-36	17.9	65.1	17.0	6.0	11.9	Nil
36-54	53.8	32.2	14.0	18.3	35.5	Nil
54-115	40.4	50.6	9.0	19.2	21.2	Nil
115-130	2.4	68.6	29.0	0.9	1.5	Nil
130-155	2.6	65.8	31.6	0.8	1.8	Nil
155-180	1.4	72.1	26.5	0.4	1.0	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-12	0.9	Nil	6.1	-
12-36	0.3	Nil	7.0	-
36-54	0.1	Nil	7.0	-
54-115	0.1	Nil	7.2	-
115-130	0.2	Nil	7.4	-
130-155	0.2	Nil	7.4	-
155-180	0.2	Nil	7.4	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-12	4.8	0.2	0.1	-	-	7.4	69	0.43
12-36	5.4	0.3	0.1	-	-	6.0	97	0.35
36-54	3.3	0.4	0.1	-	-	4.1	93	0.29
54-115	7.5	0.3	0.1	-	-	8.2	96	0.91
115-130	8.1	0.3	0.1	-	-	8.8	96	0.30
130-155	4.0	0.4	0.1	-	-	5.0	90	0.16
155-180	6.4	0.6	0.1	-	-	7.4	96	0.28

72. MIKIRBHETA SERIES

Classification	:	Coarse loamy, mixed, hyperthermic *Aeric Endoaquepts.*
Type location	:	26°18'52"N latitude, 92°27'47" E longitude; village Mikirbheta, district Morigaon, Assam
Profile No.	:	83 B / 7 P1
Physiographic position	:	Nearly level floodplain in the central and western part of the Morigaon district
Elevation (m)	:	40 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slight erosion
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is high
Land use and vegetation	:	Paddy. Natural vegetation : bamboo, ahat
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Morigaon district (1,573 ha)
Soil series associated	:	Morigaon

Typifying pedon : Mikirbheta sandy loam - cultivated

Apg1	0-10 cm	Dark grey (10YR 4/1 M) sandy loam; weak fine subangular blocky structure; very friable, slightly sticky and non plastic; few fine roots; few fine distinct yellowish red (5YR 5/6) mottles; very strongly acid (pH 5.0); gradual smooth boundary.
Apg 2	10-26 cm	Very dark grey (10YR 3/1 M) sandy clay loam; weak fine subangular blocky structure; very friable, slightly sticky and non plastic; few fine roots; few fine faint dark yellowish brown (10YR 4/6) mottles; moderately acid (pH 5.9); gradual smooth boundary.
Bw1	26-51 cm	Dark greyish brown (2.5Y 4/2 M) sandy loam; weak fine subangular blocky structure; friable, slightly sticky and non-plastic; few fine faint yellowish brown (10YR 5/6) mottles; slightly acid (pH 6.4); gradual smooth boundary.
Bw2	51-81 cm	Olive brown (2.5Y 4/4 M) sandy loam; moderate, medium, subangular blocky structure; friable, slightly sticky and non-plastic; few fine faint dark yellowish brown (10YR 4/6) mottles; slightly acid (pH 6.2); abrupt smooth boundary.
2C	81-135 cm	Olive brown (2.5Y 4/4 M) sand; single grain; loose, non sticky and non plastic; few fine faint dark yellowish brown mottles; neutral (pH 6.7).
	135 cm+	Watertable

Range in characteristics : The solum thickness varies from 80 to 100 cm. The thickness of A horizon varies from 15 to 25 cm, colour is in the hue 10YR , value 3 to 4, chroma 1 to 2. The texture is sandy loam. The thickness of B horizon ranges from 60 to 80 cm. The colour is in the hue 10YR or 2.5Y, value 3 to 4, chroma 2 to 4. The lithologically discontinuous sandy C horizon is observed below the depth of 80 cm.

Competing series and their differentiae : No competing series is identified.

Interpretation : Mikirbheta soils are coarse loamy over sand. These soils are poorly drained due to ground water fluctuating between 1.5 to 2.5 m and are subjected to hydromorphic conditions. As a result, they are suited only for rice. Water stagnation is common in these soils during rainy season due to high ground water table.

Interpretative grouping :

i)	Land capability sub-class	IIw
ii)	Irrigability sub-class	2sd
iii)	Productivity potential	High.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low organic matter, coarse texture, low fertility
Wheat, potato, cabbage, mustard, tomato, beans, pea, cowpea	Marginally suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-10	53.9	30.1	16.0	14.5	39.4	Nil
10-26	50.1	27.9	22.0	11.8	38.3	Nil
26-51	58.9	24.1	17.0	16.1	42.8	Nil
51-81	53.0	29.0	18.0	15.3	37.7	Nil
81-135	93.0	-	7.0	2.7	90.3	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-10	0.9	Nil	5.0	Nil
10-26	0.7	Nil	5.9	Nil
26-51	0.2	Nil	6.4	Nil
51-81	0.2	Nil	6.2	Nil
81-135	0.1	Nil	6.7	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-10	3.8	0.6	0.1	-	-	5.8	77	0.36
10-26	6.6	0.6	0.1	-	-	8.0	91	0.36
26-51	4.8	0.6	0.1	-	-	5.7	96	0.33
51-81	5.6	0.4	0.1	-	-	6.3	97	0.35
81-135	2.2	0.4	-	-	-	3.0	87	0.43

73. MORIGAON SERIES

Classification	:	Fine-loamy, mixed, hyperthermic *Typic Fluvaquents*.
Type location	:	26°19'17"N latitude, 92°18'56"E longitude; village Baruakhat, district Morigaon, Assam.
Profile No.	:	83 B / 7 P17
Physiographic position	:	Very gently sloping floodplain on the central part of Morigaon district
Elevation (m)	:	50-60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Very gently sloping (1-3 % slope), slight erosion
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is moderately low
Land use and vegctation	:	Paddy. Natural vegetation : bamboo, ahat , shimul, kadam
Geology and parent material	:	Recent alluvium
Distribution and extent	:	Extensive in Morigaon district (20,115 ha)
Soil series associated	:	Barbhagia, Haldibari, Dighalbari , Mikirbheta

Typifying pedon : Morigaon loam - cultivated

Apg1	0-10 cm	Dark grey (10YR 4/1 M) loam; weak fine subangular blocky structure; friable, non-sticky and non plastic; many very fine, fine and medium roots; root mottles; strongly acid (pH 5.2); gradual smooth boundary.
Apg2	10-26 cm	Grey (10YR 5/1 M) sandy clay loam; weak fine subangular blocky structure; friable, non sticky and non plastic; many very fine and medium roots, few fine faint yellowish brown (10YR 5/6) mottles; slightly acid (pH 6.2); gradual wavy boundary.
Cg1	26-56 cm	Dark grey (10YR 4/1 M) sandy loam; weak fine subangular blocky structure; friable, non-sticky and non-plastic; common very fine, fine and medium roots; few medium faint dark yellowish brown (10YR 4/6) mottles; slightly acid (pH 6.3); gradual smooth boundary.
2Cg2	56-80 cm	Dark grey (10YR 4/1 M) sandy loam; structureless; loose, non sticky and non plastic; few very fine and fine roots; many medium faint dark yellowish brown (10YR 4/6) mottles; slightly acid (pH 6.5); gradual smooth boundary.
2Cg3	80-105 cm	Dark grey (10YR 4/1 M) loam; structureless; loose, slightly sticky and non-plastic; many medium faint yellowish brown (10YR 5/6) mottles; neutral (pH 6.8); gradual smooth boundary.
2Cg4	105-130 cm	Greyish brown (10YR 5/2 M) clay loam; structureless; friable, sticky and slightly plastic; many coarse distinct strong brown (7.5YR5/8) mottles; neutral (pH 6.9).

Range in characteristics : The Morigaon soils are very deep. The thickness of A horizons ranges from 10 to 26 cm, the hue 10YR, value 4 to 5 and chroma 1 to 2. C horizon is below 25 to 30 cm depth and the colour is in hue of 10YR, value ranges from 4 to 5 and chroma 1 to 2. The texture is sandy loam or loam. Clay loam texture is observed below 100 cm depth.

Competing series and their differentiae : No competing series is identified.

Interpretation : Morigaon soils are medium textured and occur in low land situations causing the problem of soil-air relationship. They are subject to stagnation during rainy seasons. These soils are suited for rice.

Interpretative grouping :

i)	Land capability sub-class	IIIw
ii)	Irrigability sub-class	2sd
iii)	Productivity potential	High.

- Reported earlier as Sonaipara series

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low organic matter, low fertility
Wheat, potato, cabbage, mustard, tomato, beans, pea, cowpea	Marginally suitable	Low pH, low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-10	47.4	33.6	19.0	6.5	40.9	Nil
10-26	51.2	23.8	25.0	10.0	41.2	Nil
26-56	59.4	21.6	19.0	10.4	49.0	Nil
56-80	78.8	8.7	12.5	11.7	67.1	Nil
80-105	40.5	36.0	23.5	4.5	36.0	Nil
105-130	26.3	39.7	34.0	2.5	23.8	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-10	1.0	Nil	5.2	Nil
10-26	0.6	Nil	6.2	Nil
26-56	0.3	Nil	6.3	Nil
56-80	0.2	Nil	6.5	Nil
80-105	0.2	Nil	6.8	Nil
105-130	0.3	Nil	6.9	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-10	2.4	0.3	0.1	NA	NA	3.2	87	0.17
10-26	3.4	0.1	0.1	-	-	3.8	95	0.15
26-56	3.0	0.3	0.1	-	-	3.8	89	0.20
56-80	2.6	0.2	0.1	-	-	3.1	93	0.25
80-105	4.0	0.3	0.1	-	-	4.8	92	0.20
105-130	4.6	0.3	0.1	-	-	5.2	96	0.15

74. POLAGURI SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Fluventic Dystrudepts.*
Type location	:	26°07'02"N latitude, 92°16'41"E longitude; village Polaguri, district Morigaon, Assam.
Profile No.	:	83 B /8 P5
Physiographic position	:	Nearly level to level uplands on the southern part of the Morigaon district
Elevation (m)	:	80 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1860 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slight erosion
Drainage & permeability	:	Moderately well drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy. Natural vegetation : sal, azar
Geology and parent material	:	Sedimentary
Distribution and extent	:	Extensive in Morigaon district (2,046 ha)
Soil series associated	:	Beltala

Typifying pedon : Polaguri loam - cultivated

Ap1	0-12 cm	Dark yellowish brown (10YR 4/4 M) loam; weak fine subangular blocky structure; soft, friable, slightly sticky and non plastic; many very fine and fine roots; strongly acid (pH 5.3); clear smooth boundary.
Ap2	12-38 cm	Dark yellowish brown (10YR 4/4 M) silt loam; weak fine subangular blocky structure; soft, friable, slightly sticky and non plastic; common very fine and fine roots; moderately acid (pH 5.7); gradual smooth boundary.
Bw1	38-63 cm	Dark yellowish brown (10YR 3/4 M) silt loam; moderate fine and weak medium subangular blocky structure; friable, slightly sticky and non-plastic; few very fine and fine roots; moderately acid (pH 5.9); gradual smooth boundary.
Bw2	63-88 cm	Dark brown (10YR 4/3 M) silt loam; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; many medium distinct dark reddish brown (5YR 3/4) mottles; moderately acid (pH 5.7); gradual smooth boundary.
Bw3	88-113 cm	Dark brown (10YR 3/3 M) silt loam; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; many medium distinct dark reddish brown (5YR 3/4) mottles; moderately acid (pH 5.8); gradual smooth boundary.
Bw4	113-138 cm	Dark brown (10YR 3/3M) silt loam; weak medium subangular blocky structure; friable, slightly sticky and non-plastic; many medium distinct dark reddish brown (5YR 3/4) mottles; strongly acid (pH 5.5); gradual smooth boundary.
Bw5	138-163 cm	Dark brown (10YR 3/3 M) silt loam; weak medium subangular blocky structure; friable, slightly sticky and non plastic; many medium distinct dark reddish brown mottles (5YR 3/4); moderately acid (pH 5.8).

Range in characteristics : Polaguri soils are very deep with the depth of solum ranging from 145 to 160 cm or more. Thickness of the Ap horizon varies from 15 to 38 cm; the colour is in hue of 10YR, value 4 and chroma 3 to 4 and texture is silt loam or loam. The thickness of B horizon ranges from

120 to 140 cm, the colour is in hue of 10YR, value 3 to 5, chroma 3 to 5 with the texture silt loam; the mottles starts appearing at a depth of 43 to 63 cm.

Competing series and their differentiae : Furkating series identified in Golaghat district is competing. Furkating soils have more than 30-35% clay while qualifying for fine-silty textural class.

Interpretation : These soils are medium textured with moderate available water holding capacity. These soils have problems of drainage due to high water holding capacity and partial water logging. These soils are suitable for paddy.

Interpretative grouping :

i) Land capability sub-class IIIw
ii) Irrigability sub-class 2d
iii) Productivity potential Medium.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low pH, low fertility
Wheat, potato, mustard, tomato, beans, cowpea	Moderately suitable	Low pH, low fertility
Cabbage, pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-12	31.1	47.9	21.0	3.3	27.8	Nil
12-38	22.1	58.4	19.5	1.5	20.6	Nil
38-63	16.8	63.2	20.0	1.2	15.6	Nil
63-88	8.5	70.5	21.0	2.1	6.4	Nil
88-113	13.5	66.0	20.5	1.6	11.9	Nil
113-138	12.8	67.2	20.0	2.4	10.4	Nil
138-163	19.1	61.4	19.5	4.3	14.8	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-12	1.2	Nil	5.3	Nil
12-38	0.7	Nil	5.7	Nil
38-63	0.7	Nil	5.9	Nil
63-88	0.6	Nil	5.7	Nil
88-113	0.6	Nil	5.8	Nil
113-138	0.7	Nil	5.5	Nil
138-163	0.7	Nil	5.8	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-12	5.8	0.2	0.1	NA	NA	10.4	59	0.49
12-38	4.2	0.3	0.1	-	-	7.6	61	0.39
38-63	4.8	0.3	0.1	-	-	8.8	59	0.44
63-88	4.2	0.3	0.1	-	-	8.2	56	0.39
88-113	4.2	0.3	0.1	-	-	8.6	53	0.42
113-138	6.8	0:3	0.1	-	-	9.0	80	0.45
138-163	5.0	0.3	0.1	-	-	8.8	61	0.45

75. AMBARI SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquepts*.
Type location	:	26°3'40"N latitude, 91°36'0"E longitude; Village Ambari, Police station Palasbari, District Kamrup, Assam.
Profile No.	:	78 N KRDW-14
Physiographic position	:	Level flood plains of Kamrup district
Elevation (m)	:	55 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Level to very gently sloping (0-1% slope), slightly erosion
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Paddy.
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup district (29,080 ha)
Soil series associated	:	Singra, Habilagaon

Typifying pedon : Ambari sandy loam – cultivated.

Ap	0-19 cm	Greyish brown (10YR 5/2M) sandy loam; puddled; friable and slightly sticky; many fine and common medium roots; strongly acid (pH 5.3); clear smooth boundary.
Bwg1	19-44 cm	Light brownish grey (10YR 6/2M) sandy loam; weak fine subangular blocky breaking to fine granular structure; common medium distinct yellowish brown (10YR 5/8) mottles; friable and slightly sticky; few fine and medium roots; common fine and medium pores; slightly acid (pH 6.2); clear smooth boundary.
Bwg2	44-77 cm	Light brownish grey (10YR 6/2) sandy clay loam; weak medium subangular blocky structure; faint yellowish brown (10YR 5/8) mottles; common medium yellowish red glaebules; few fine roots; common fine pores; slightly acid (pH 6.2); clear smooth boundary.
Bw3	77-102 cm	Yellowish brown (10YR 5/6M) sandy clay loam; strong, medium sub-angular blocky structure; firm and sticky; common medium prominent grey (10YR 6/1) mottles; common soft red Fe-Mn glaebules; few fine pores; slightly acid (pH 6.5).

Type location : Village Ambari, Police station Palasbari, District Kamrup, Assam.

Range in characteristics : The Ambari soils are very deep. The A horizons is 14 to 20 cm. thick. Its colour is in hue 10 YR, value 5 to 7 and chroma 1 to 2. The texture is sandy loam or loam. The colour of B horizon is in hue 10 YR, value 5 to 6 and chroma 1 to 2. The texture is dominantly sandy clay loam. It is prominently mottled and have yellowish red Fe-Mn glaebules.

Geographic setting : Ambari soils occur on level flood plains of Kamrup district at elevations of about 55 m above mean sea level. The climate is humid subtropical with mean annual rainfall of 1950 mm (Met. Station: Rangia), mean annual temperature of 24.8°C, mean summer temperature of 28.3°C and mean winter temperature of 19.2°C. The soil moisture regime is aquic as the soil remains waterlogged for a significant period in years of normal rainfall.

Competing series and their differentiae : Matikhola series identified in Jorhat district, Dighalbari series identified in Morigaon district are competing series. Matikhola series has clay loam texture throughout the depth. Dighalbari series has a clay content of 30 to 33 percent in the upper 40 cm.

Drainage and saturated hydraulic conductivity : Poorly drained in the monsoon season due to rising water table. The drainage improves in the post rainy season as the water table moves down. The saturated hydraulic conductivity is moderately high in the upper 40 to 50 cm and moderately low in the subsoils.

Use and vegetation : Cultivated to rice.

Distribution and extent : Extensive in the level flood plain of Kamrup district of Assam, particularly along the stream channels.

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

Interpretative grouping :

i) Land capability subclass IIIw

ii) Irrigability sub class 3d or 2d

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low pH, low organic matter, low fertility
Potato, beans	Moderately suitable	Low pH, low organic matter, low fertility
Mustard, tomato, wheat, pea, cowpea	Marginally suitable	Low pH, low organic matter, coarse texture, low fertility
Cabbage	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-19	71.7	16.1	12.2	24.7	47.0	Nil
19-44	66.0	17.0	17.0	16.2	49.8	Nil
44-77	59.0	18.2	22.8	12.4	46.6	Nil
77-102	50.5	14.9	34.6	9.5	41.0	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-19	0.84	Nil	5.3	Nil
19-44	0.23	Nil	6.2	Nil
44-77	0.25	Nil	6.2	Nil
77-102	0.31	Nil	6.5	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-19	2.5	0.15	0.1	0.8	0.4	5.0	55	0.41
19-44	3.9	0.25	0.05	0.1	-	5.2	80	0.31
44-77	5.6	0.25	0.05	0.1	-	7.4	80	0.32
77-102	5.6	0.25	0.05	0.1	-	8.0	74	0.23

76. BHARATPUR SERIES

Classification	:	Fine loamy, mixed hyperthermic family of *Fluventic Dystrudepts*.
Type location	:	25°55'40"N latitude, 91°5'0"E longitude; Village Bharatpur munga farm, Police station – Boko, District Kamrup, Assam.
Profile No.	:	78 0 BKW85 9
Physiographic position	:	Very gently sloping (1 to 3 percent) piedmont plains in the district of Kamrup
Elevation (m)	:	65-70 m above MSL
Groundwater table	:	5-10 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly erosion
Drainage & permeability	:	Well drained .saturated hydraulic conductivity Is moderately low
Land use and vegetation	:	Commonly under forest plantation. Crops like mustard are grown in some places.
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup district (6,512 ha)
Soil series associated	:	Rangingpara

Typifying pedon : Bharatpur loam – forest.

A1	0-14 cm	Dark brown to brown (10YR 3/3, 4/3 M) loam; moderate, medium subangular blocky structure; friable and non-sticky; many fine common medium and few coarse roots; abundant fine and medium pores; very strongly acid (pH 4.9); gradual smooth boundary.
A2	14-33 cm	Dark yellowish brown (10YR 4/4 M) sandy loam; moderate medium subangular blocky structure; friable, sticky and non plastic; common fine and few coarse roots; abundant fine and common medium pores; very strongly acid (pH 4.7); clear smooth boundary.
Bw1	33-56 cm	Strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable and slightly sticky; few fine and medium roots; common fine and few medium pores; very strongly acid (pH 4.8); gradual smooth boundary.
Bw2	56-108 cm	Reddish yellow (7.5 YR 6/8 M) loam; weak fine subangular blocky structure; friable and sticky; few fine roots; common fine pores; very strongly acid (pH 5.0).

Range in characteristics : Bharatpur soils are very deep. The A horizons is 15-35 cm. thick. Its colour is in hue 10 YR, value 3 to 4 and chroma 3. The texture is sandy loam or loam. The thickness of B horizon is 75 to 85 cm. Its colour is in 7.5 YR or 10YR, value 4 to 6 and chroma 4 to 8. The texture is loam or sandy clay loam. The structure is subangular blocky. Roots are distributed up to 100 cm depth.

Competing series and their differentiae : Competing series is Domgaon series identified in Sibsagar district. Domgaon soils have lower sand content (15 to 40 percent), higher silt content (40 to 65 percent) and higher pH (5.6 to 6.0).

Interpretative grouping :

i)	Land capability subclass	IIIs or IIsw
ii)	Irrigability sub class	2s.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Moderately suitable	Low organic matter, low fertility
Wheat, mustard, cabbage, tomato, potato, pea, bean, cowpea	Marginally suitable	Low pH, low base saturation, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	49.6	36.5	13.9	15.7	33.9	Nil
14-33	56.5	24.5	19.0	17.2	39.3	Nil
33-56	48.0	25.1	26.9	12.6	35.4	Nil
56-108	49.0	29.3	21.7	17.4	31.6	Nil

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	1.38	Nil	4.9	Nil
14-33	0.86	Nil	4.7	Nil
33-56	0.47	Nil	4.8	Nil
56-108	0.41	Nil	5.0	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-14	2.25	0.05	0.05	1.0	1.6	5.8	40	0.42
14-33	1.50	0.13	0.07	0.8	0.8	5.9	28	0.31
33-56	1.70	0.10	0.10	2.2	0.8	7.6	25	0.28
56-108	1.65	0.15	0.15	2.6	1.8	7.2	27	0.33

77. HABILAGAON SERIES

Classification	:	Fine-silty, mixed, hyperthermic family of *Aeric Endoaquepts*.
Type location	:	26°2'28"N latitude, 91°2'56"E longitude; Village Habilagaon, Police station – Boko, District Kamrup, Assam.
Profile No.	:	78N / MKW 46
Physiographic position	:	Nearly level active flood plains in Kamrup district.
Elevation (m)	:	52 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slight erosion
Drainage & permeability	:	Poorly drained in the rainy season , drainage conditions improve in the post-rainy period The saturated hydraulic conductivity is low
Land use and vegetation	:	Mostly Ahu paddy and upland crops.
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup district (11,498 ha)
Soil series associated	:	Ambari

Typifying pedon : Habilagaon clay - cultivated.

Ap	0-14 cm	Greyish brown (10YR 5/2 M) clay; puddled; firm, very sticky and plastic; common medium and fine roots; common fine pores; slightly acid (pH 6.4); clear smooth boundary.
Bw1	14-40 cm	Brown (10YR 4/3 M) clay; strong medium subangular blocky structure; firm, sticky and plastic; common fine and few medium roots; few fine faint yellowish brown (10YR 5/8) mottles; common fine pores; slightly acid (pH 6.4); clear wavy boundary.
Bwg1	40-75 cm	Grey (10YR 5/1 M) clay loam; weak medium subangular blocky structure; friable, sticky and slightly plastic; few fine roots; common medium and distinct yellowish brown (10YR 5/8) mottles; common fine and medium pores; neutral (pH 6.8); abrupt smooth boundary.
Bwg2	75-100 cm	Grey (10YR 5/1 M) loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; few fine roots; slightly acid (pH 6.5).
2C	100-150 cm	Sand.

Range in characteristics : Habilagaon soils are very deep. The thickness of A horizons is 14 to 18 cm. Its colour is in hue 10 YR value 4 to 5 and chroma 1 to 2. Its texture is clay or silty clay. The B horizon is 80 to 100 cm thick. Its colour is in hue 10YR, value 3 to 5 and chroma 1 to 2. The texture is clay loam or loam. The B horizons are distinctly mottled with high chroma colours. Roots are distributed up to 100 cm depth.

Competing series and their differentiae : The Titabar series identified in Jorhat district, Dhing series identified in Nagaon district and Kumarkuchi series identified in Morigaon district are competing series. Titabar soils have sand content of 22 to 25 percent below 50 cm depth. They have a pH of 5.2 to 5.5. Dhing soils have sand content of less than 5 percent below 50 cm. They have silt content of 43 to 67 percent through depth. Kumarkuchi soils have sand content of more than 40 percent below 50 cm depth. They have a pH of 5.6 to 6.0 in the control section and less than 5.0 in the surface.

Interpretative grouping :

i) Land capability subclass IIw
ii) Irrigability sub class 3d.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Wheat, cabbage, tomato, beans, pea, cowpea	Suitable	No limitation
Potato, mustard	Moderately suitable	Fine texture

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	16.0	30.2	53.8	13.0	3.0	Nil
14-40	18.0	37.4	44.6	14.5	3.5	Nil
40-75	23.5	44.3	32.2	15.0	8.5	Nil
75-100	39.0	42.3	18.7	37.8	1.2	Nil

Depth (cm)	O.C. (%)	CaCO (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	1.52	Nil	6.4	Nil
14-40	1.54	Nil	6.4	Nil
40-75	0.50	Nil	6.8	Nil
75-100	0.27	Nil	6.5	Nil

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-14	10.8	0.3	0.2	-	-	13.0	87	0.24
14-40	10.6	0.7	0.1	-	-	12.1	94	0.27
40-75	8.8	0.6	0.1	-	-	9.9	96	0.31
75-100	4.5	0.4	0.05	-	-	6.0	82	0.32

78. KAMRUP SERIES

Classification	:	Coarse loamy, mixed, hyperthermic family of *Aquic Udifluvents*.
Type location	:	25°54'32"N latitude, 91°14'21"E longitude; Village Tarabari, Police station Boko, District Kamrup, Assam.
Profile No.	:	780 BKW-109
Physiographic position	:	Nearly level active flood plains in Kamrup district.
Elevation (m)	:	60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), very slightly erosion
Drainage & permeability	:	Moderately well to somewhat poorly drained in rainy season, improves in post rainy season and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Paddy
Geology and parent material	:	Recent alluvium
Distribution and extent	:	Extensive in Kamrup (13,654 ha) and Dhubri (44,822 ha) districts
Soil series associated	:	Singra

Typifying pedon : Kamrup sandy loam – cultivated.

Ap	0-20 cm	Dark greyish brown (10YR 4/2 M) sandy loam; weak medium granular structure; friable and non-sticky; many fine common medium and few coarse roots; many medium and few coarse pores; moderately acid (pH 5.6); clear smooth boundary.
C1	20-45 cm	Dark yellowish brown (10YR 4/4 M) sandy loam; weak fine granular structure; very friable and non-sticky; many fine and few medium and coarse roots; many medium and few coarse pores; moderately acid (pH 5.6); abrupt smooth boundary.
C2	45-60 cm	Dark greyish brown (10 YR 4/2 M) sandy loam; massive; very friable and non-sticky; common fine and few medium and coarse roots; strongly acid (pH 5.5); abrupt smooth boundary.
2C3	60-100 cm	Dark brown (10 YR 4/3 M) loam; massive; friable and slightly sticky; common fine and few medium roots; common medium and fine yellowish red (5YR 5/6) mottles; common fine and few medium roots; strongly acid (pH 5.3); abrupt smooth boundary.
3C4	100-125 cm	Dark yellowish brown (10 YR 4/4 M) sandy loam; massive; friable and non-sticky; few fine, few medium and coarse roots; moderately acid (pH 5.6).

Range in characteristics : Kamrup soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in hue 10 YR, value 3 to 4 and chroma 2 to 3. The texture is sandy loam or sandy clay

loam. The colour of C horizon is in hue 10YR, value 4 to 5 chroma 2 to 4. The texture is generally sandy loam and loam texture is also observed. Structural development is not generally observed. Roots are distributed up to a depth of 120 cm.

Competing series and their differentia : No competing series is identified.

Interpretative grouping :

i)	Land capability subclass	IIs or IIIs
ii)	Land Irrigability sub class	2d.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Coarse texture, low organic matter, low fertility
Mustard, cabbage, tomato, potato, beans, pea, cowpea	Moderately suitable	Low pH, low organic matter, coarse texture, low fertility
Wheat	Marginally suitable	Low organic matter, coarse texture

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	75.0	16.8	8.2	25.8	49.2	-
20-45	59.0	28.0	13.0	17.3	41.7	-
45-60	66.5	25.8	7.7	18.3	48.2	-
60-100	29.5	46.5	24.0	19.5	10.0	-
100-125	75.0	17.8	7.2	11.3	63.7	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	0.85	-	5.6	-
20-45	1.03	-	5.6	-
45-60	0.52	-	5.5	-
60-100	1.20	-	5.3	-
100-125	0.43	-	5.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	1.90	0.1	0.04	0.40	0.20	3.2	64	0.39
20-45	2.70	0.1	0.03	0.55	0.35	4.1	69	0.32
45-60	3.00	0.1	0.03	0.65	0.45	4.2	74	0.54
60-100	2.35	0.1	0.05	1.55	1.15	4.6	54	0.19
100-125	2.05	0.1	0.02	0.50	0.35	4.0	54	0.55

79. KHELIAPARA SERIES

Classification	:	Sandy over loamy, mixed, hyperthermic family of *Oxyaquic Udifluvents*.
Type location	:	26°08'22"N latitude, 91°34'19"E longitude; Village Kheliapara; Police station – Palasbari, District Kamrup, Assam.
Profile No.	:	78 N KRDW-31
Physiographic position	:	Very gently sloping channel bars and active flood plains of Brahmaputra valley in Kamrup district
Elevation (m)	:	53 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), very slightly erosion
Drainage & permeability	:	Well to moderately well drained in rainy season, improves in post rainy season and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup district (5,608 ha)
Soil series associated	:	Habilagaon

Typifying pedon : Kheliapara loamy sand – cultivated

Ap	0-15 cm	Light brownish grey (10YR 6/2 M) loamy sand; massive; very friable and non sticky; many fine and medium roots ; common medium and few coarse pores; neutral (pH 7.0); clear smooth boundary.
A2	15-42 cm	Dark greyish brown (10YR 4/2 M) loamy sand; weak fine granular structure; few medium and fine roots; common medium and few coarse pores; neutral (pH 7.1); abrupt smooth boundary.
2C1	42-65 cm	Brown (10YR 5/3 M) clay loam; massive; friable and sticky; few fine roots; common fine and few medium pores; neutral (pH 6.9); clear smooth boundary.
2C2	65-102 cm	Dark yellowish brown (10YR 4/4 M) clay loam; massive; firm and sticky; few fine roots; few fine faint yellowish brown (10 YR 5/6) mottles; few fine pores; neutral (pH 6.9); abrupt smooth boundary.
3C3	102-130 cm	Fine sand.

Range in characteristics : Kheliapara soils are very deep. The thickness of A horizon is 15 to 40 cm. Its colour is in hue 10 YR, value 4 to 6 and chroma 2 to 3. The texture is loamy sand or sand. The C horizons are variable in the thickness and texture. The colour is in hue 10 YR, value 4 to 6 and chroma 2 to 4. The texture is clay loam up to the depth of 100 cm and thereafter sandy layers are observed. High chroma mottles appear below 60 cm. Roots are distributed up to 100 cm.

Competing series and their differenties : No competing series is identified.

Interpretative grouping :

i)	Land capability subclass	IVs
ii)	Land Irrigability sub class	3s

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low organic matter, coarse texture
Wheat, cabbage, pea	Marginally suitable	Low organic matter, coarse texture, low fertility, low water availability
Mustard, tomato, potato, beans, cowpea	Marginally suitable	Low organic carbon, coarse texture

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	82.0	13.2	4.8	49.8	32.2	-
15-42	79.7	13.5	6.8	43.1	36.6	-
42-65	35.9	30.2	33.9	13.2	22.7	-
65-102	26.1	37.2	36.7	16.9	9.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.78	-	7.0	-
15-42	0.51	-	7.1	-
42-65	0.17	-	6.9	-
65-102	0.20	-	6.9	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	1.60	0.10	0.50	0.1	-	2.7	96	0.56
15-42	1.70	0.14	0.16	0.05	-	2.8	97	0.41
42-65	4.75	0.18	0.52	0.05	-	7.4	99	0.22
65-102	5.40	0.14	0.48	0.05	-	7.6	99	0.21

80. MALITA SERIES

Classification	:	Loamy skeletal, mixed, hyperthermic family of *Typic Udorthents.*
Type location	:	26°5'12"N latitude, 91°32'51"E longitude; Village Malita, Police station Miza, District Kamrup, Assam
Profile No.	:	78 N KRDW-24
Physiographic position	:	moderately steep to steep hill slopes
Elevation (m)	:	250-350 m above MSL
Groundwater table	:	>10
Rainfall	:	1950 mm
Slope, erosion &relief	:	Moderately steep to steep hill slopes, severely eroded
Drainage & permeability	:	Excessively drained and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Thin forest
Geology and parent material	:	Weathered gneiss
Distribution and extent	:	Extensive in Kamrup district (10,528 ha)
Soil series associated	:	Nilachal

Typifying pedon : Malita sandy loam – forest.

A	0-15 cm	Very dark greyish brown (10YR 3/2 M) sandy loam; moderate medium granular structure; very friable and non sticky; many fine and medium roots; few coarse (than 1 cm) fragments; many fine and medium pores; strongly acid (pH 5.5); clear smooth boundary.
C1	15-34 cm	Brown (10YR 4/3 M) sandy clay loam; weak fine granular structure; friable and non sticky, common (30-40%, more than 1 cm) fragments; abundant fine and medium pores; common fine and medium roots; strongly acid (pH 5.2); abrupt smooth boundary.
C2	34-70 cm	Red to yellowish red (2.5 YR 4/6 to 5 YR 5/6) sandy loam; massive; friable and non sticky; many (50-60%) coarse fragments; few fine and medium roots; strongly acid (pH 5.4); clear wavy boundary.
C3	70-100 cm	Weathered biotite gneiss.

Range in characteristics : Malita soils are moderately deep to deep. The thickness of A horizon is 15 to 25 cm. The colour is in hue 10 YR, value 3 to 4 and chroma 2 to 3. The structure is granular. The C horizon is 50 to 70 cm thick. The colour is in hue 2.5 YR to 10YR, value 4 to 6 and chroma 3 to 6. Its texture is sandy clay loam or sandy loam. C horizons have large quantities of coarse fragments (35 to 60 percent). They do not have structural development.
Competing series and their differentiae : No competing series is identified.

Interpretative grouping :

i)	Land capability subclass	VIe
ii)	land Irrigability sub class	6t

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	68.1	20.7	11.2	19.2	48.9	5.2
15-34	63.7	15.3	21.0	10.5	53.2	35
34-70	55.7	26.3	18.0	15.1	40.6	60

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.64	-	5.5	-
15-34	0.20	-	5.2	-
34-70	0.21	-	5.4	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	1.55	0.10	0.38	1.40	1.10	4.25	48	0.38
15-34	1.04	0.16	0.32	2.40	1.80	4.75	32	0.23
34-70	0.95	0.10	0.20	1.90	1.60	3.50	36	0.19

81. MOINDRA SERIES

Classification	:	Fine, mixed, hyperthermic family of *Aeric Endoaquepts*.
Type location	:	26°2'25"N latitude, 91°4'54"E longitude; Village Moindra, Police station – Boko, District Kamrup, Assam
Profile No.	:	78 N MKW-24
Physiographic position	:	Dissected nearly level flood plains in Kamrup district.
Elevation (m)	:	55 m above MSL
Groundwater table	:	1 to 2
Rainfall	:	1950 mm
Slope, erosion &relief	:	Nearly level to very gently sloping
Drainage & permeability	:	Poorly drained in mansoon, improves in post rainy season and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Paddy
Geology and parent material	:	Sedimentary
Distribution and extent	:	Extensive in Kamrup district (14,021 ha)
Soil series associated	:	Nichalamari

Typifying pedon : Moindra sandy clay loam – cultivated.

Ap	0-14 cm	Dark greyish brown (10YR 4/2 M) sandy clay loam; friable, slightly sticky and plastic; many fine and few medium roots; common fine and medium and few coarse pores; strongly acid (pH 5.5); abrupt wavy boundary.
Bw1	14-38 cm	Very dark greyish brown (10YR 3/2 M) clay; moderate medium, sub-angular blocky structure; firm, sticky and plastic; common fine roots; common faint dark reddish brown (5YR 3/2) mottles; many fine and common medium inped pores; strongly acid (pH 5.5); abrupt smooth boundary.
Bw2	38-72 cm	Dark greyish brown (10YR 4/2 M) silty clay loam; moderate medium subangular blocky structure; firm, very sticky and plastic; few fine roots; common medium distinct yellowish brown (10YR 5/8) and dark reddish brown (5YR 3/2) mottles; strongly acid (pH 5.5); clear wavy boundary.
Bw3	72+ cm	Dark grey (10YR 4/1 M) silty clay; massive and compact; firm, sticky and plastic; many medium distinct yellowish brown (10YR 5/8) mottles; moderately acid (pH 5.9).

Range in characteristics : Moindra soils are very deep. The thickness of A horizon is 11 to 16 cm. Its colour is in hue 10 YR, value 4 to 5 and chroma 1 to 2. The texture is sandy clay loam or clay loam. The thickness of B horizon is more than 100 cm. The colour is in hue 10YR, value 3 to 4 and chroma 1 to 2. The texture is silty clay to clay or silty clay loam. The structure is

moderate medium subangular blocky up to 75 cm and massive in the lower parts. High chroma mottles are common.

Competing series and their differentiae : Dharamtul series identified in Morigaon district and Krishnai series identified in Goalpara district are competing. Dharamtul soils have a clay content of 60 to 73 percent and pH of 4.0 to 4.8 percent. The Krishnai soils have 33 to 42 percent clay and pH 5.3 in the surface and 6.2 to 6.7 in subsoils.

Interpretative grouping :

i)	Land capability subclass	IIIw
ii)	Irrigability sub class	3d.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low fertility
Tomato, potato, beans	Moderately suitable	Low pH, low fertility
Mustard, cabbage, wheat, pea, cowpea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-14	47.5	19.9	32.6	23.5	24.1	-
14-38	13.5	36.1	50.4	11.7	1.8	-
38-72	14.5	45.7	39.8	7.5	7.0	-
72+	16.0	41.8	42.2	5.5	10.5	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-14	1.04	-	5.5	-
14-38	1.84	-	5.5	-
38-72	1.17	-	5.5	-
72+	0.74	-	5.9	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-14	5.4	0.3	0.2	2.5	1.2	10.5	56	0.32
14-38	4.6	0.3	0.1	6.0	4.6	13.4	37	0.27
38-72	6.0	0.3	0.1	2.6	2.3	11.5	56	0.29
72+	8.0	0.3	0.1	4.0	0.8	11.8	71	0.28

82. NICHALAMARI SERIES

Classification	:	Fine, mixed, hyperthermic family of *Typic Dystrudepts*.
Type location	:	26°31'14"N latitude, 91°5'23"E longitude; Village Nichalamari, Police station Boko, District Kamrup, Assam.
Profile No.	:	78 N MKW-1
Physiographic position	:	Very gently sloping upland and dissected flood plains in Kamrup district.
Elevation (m)	:	55 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Well drained and Saturated hydraulic conductivity is low
Land use and vegetation	:	Jute pulses, horticultural plantation, pasture land
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup (14,399 ha), Cachar (63,089 ha), and Karimganj (35,543 ha) districts
Soil series associated	:	Moindra

Typifying pedon : Nichalamari clay loam – cultivated.

Ap	0-18 cm	Dark yellowish brown (10YR 4/4 M) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; common fine and few medium roots; few insect holes; common fine and medium pores; very strongly acid (pH 5.0); clear smooth boundary.
Bw1	18-40 cm	Yellowish brown (10YR 5/6 M) clay; moderate, medium sub-angular blocky structure; firm, sticky and plastic; few fine and medium roots; few insect channels; common fine and few medium pores; strongly acid (pH 5.3); gradual smooth boundary.
Bw2	40-70 cm	Brownish yellow (10YR 6/8 M) and yellowish red (5YR 5/8M) clay; weak fine subangular blocky structure; firm, sticky and plastic; few fine roots; common fine pores; strongly acid (pH 5.5); gradual smooth boundary.
C	70+ cm	Yellowish red (5YR 5/8 M) and brownish yellow (10YR 6/8 M) clay; massive; firm, sticky and plastic; few fine pores; moderately acid (pH 5.6).

Range in characteristics : Nichalamari soils are very deep. The thickness of A horizon is 13-20 cm. Its colour is in hue 10 YR value 4 to 5 and chroma 3 to 4. The texture is clay loam or clay. The B horizon is 40 to 60 cm thick. Its colour is in 5YR to 10YR, value 5 to 6 and chroma 6 to 8. The texture ranges from silty clay to clay. The C horizon is in the hue 5 YR to 10YR and value 5 to 6 and chroma 8. It is clayey and concretionary. The strucure is moderate or strong medium subangular blocky. The roots are distributed upto a depth of 70 cm.

Competing series and their differentiae : No competing series is identified.

Interpretative grouping :

i)	Land capability subclass	IIIs
ii)	Irrigability sub class	2s or 2d.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low base saturation, low fertility
Tomato, potato, cowpea	Marginally suitable	Low pH, low fertility
Wheat, mustard, cabbage, beans, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-18	39.5	30.2	30.3	30.3	9.2	-
18-40	29.0	28.3	42.7	26.8	2.2	-
40-70	8.0	37.8	54.2	6.2	1.8	-
70+	19.0	31.1	49.9	13.0	6.0	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-18	1.50	-	5.0	-
18-40	0.64	-	5.3	-
40-70	0.56	-	5.5	-
70+	0.40	-	5.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-18	1.6	0.3	0.3	2.7	2.5	7.5	29	0.25
18-40	2.2	0.2	0.2	3.4	3.0	9.1	29	0.21
40-70	3.0	0.3	0.2	3.0	2.9	9.4	37	0.17
70+	2.8	0.2	0.2	2.8	3.2	9.2	35	0.18

83. NILACHAL SERIES

Classification	:	Coarse loamy, mixed, hyperthermic family of *Typic Udorthents*.
Type location	:	25°52'42"N latitude, 91°2'51"E longitude; Village Tarabari, Police station Boko; District Kamrup, Assam
Profile No.	:	780 BKW-88
Physiographic position	:	Moderately steep to moderately sloping hill slopes in Kamrup district
Elevation (m)	:	150-250 m above MSL
Groundwater table	:	>10 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Moderately steep to moderately sloping (15-30% slope), severely eroded
Drainage & permeability	:	Excessively drained and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Mostly under bushes and grasses. Jhum cultivation is in practice.
Geology and parent material	:	Weathered gneiss
Distribution and extent	:	Extensive in Kamrup district (9,318 ha)
Soil series associated	:	Malita

Typifying pedon : Nilachal sandy loam – forest.

A	0-15 cm	Dark brown (10YR 4/3 M) sandy loam; moderate medium granular structure; very friable and non-sticky; many fine, common medium and few coarse roots; abundant fine and medium pores; strongly acid (pH 5.5); clear wavy boundary.
C1	15-40 cm	Yellowish red (5YR 5/8 M) sandy loam; weak medium granular structure; friable and non-sticky; common fine and few medium and coarse roots; few coarse fragments of one cm size; strongly acid (pH 5.1); gradual smooth boundary.
C2	40-65 cm	Yellowish red (5 YR 5/8 M) weathered rock material; sandy loam; single grain; strongly acid (pH 5.1).

Range in characteristics : Nilachal soils are moderately deep to shallow. The thickness of A horizon is 15 to 20 cm. Its colour is in hue 10 YR, value 3 to 4 and chroma 3. The texture is sandy loam. The colour of C horizon is in hue 5YR, value 5 to 6 and chroma 6 to 8. It is sandy loam or loamy sand in texture. Rooting depth is limited to 40 to 50 cm.

Competing series and their differentia : No competing series is identified.

Interpretative grouping :

i) Land capability subclass VIe
ii) land Irrigability sub class 6t.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	52.5	29.3	18.2	9.0	43.5	4.6
15-40	61.0	25.6	13.4	7.6	53.4	7.2
40-65	71.5	21.3	7.2	7.5	64.0	11.7

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.8	-	5.5	-
15-40	0.04	-	5.1	-
40-65	0.06	-	5.1	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	3.6	0.2	0.9	0.4	0.2	6.5	72	0.36
15-40	4.0	0.1	0.2	1.0	0.8	6.1	70	0.46
40-65	3.5	0.1	0.3	0.8	0.8	5.2	75	0.72

84. RANGINGPARA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Dystrudepts*.
Type location	:	25°57'0"N latitude, 91°11'0"E longitude; Village Rangingpara, Police station Boko, District Kamrup, Assam.
Profile No.	:	780 BKW-80
Physiographic position	:	Very gently sloping piedmont plains in Kamrup district
Elevation (m)	:	60-65 m above MSL
Groundwater table	:	5-10 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Well drained and Saturated hydraulic conductivity is moderately high
Land use and vegetation	:	Mostly under reserve forest
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup district (22,492 ha)
Soil series associated	:	Luki and Bharatpur.

Typifying pedon : Rangingpara loam – forest.

A	0-15 cm	Brown to dark brown (10YR 4/3 M) loam; strong medium granular structure; friable and slightly sticky; common medium and few coarse roots; common fine and medium pores; strongly acid (pH 5.1); gradual smooth boundary.
Bw1	15-36 cm	Dark yellowish brown (10YR 4/4 M) clay loam; moderate medium granular structure; friable and slightly sticky; many fine, common medium and few coarse roots; common fine and medium pores; very strongly acid (pH 4.8); gradual smooth boundary.
Bw2	36-62 cm	Yellowish brown (10 YR 5/6 M) clay loam; moderate medium subangular blocky structure; friable and sticky; common fine and few medium roots; many fine and common medium pores; very strongly acid (pH 5.0); clear wavy boundary.
Bw3	62-104 cm	Yellowish brown (10 YR 5/8 M) clay loam; massive; friable and sticky; common fine and few medium roots; common coarse fragments of red to reddish brown colour, size less than 1 cm; very strongly acid (pH 5.0).

Range in characteristics: The soils are very deep. The A horizons is 15 to 30 cm. thick. Its colour is in hue 10 YR, value 4 to 5 and chroma 3 to 4. The texture is sandy clay loam or loam. The thickness of B horizon is 75 to 100 cm. Its colour is in the hue 10 YR, value 4 to 6 and chroma 4 to 8. The texture is loam to clay loam. The structure is moderate medium subangular block in general. However, the lower B horizons have massive structure.

Competing series and their differentiae: Teok series identified in Jorhat district and Garopara series identified in Goalpara district are competing series. The Teok soils have sandy loam texture upto 40 cm, with 8-10% clay and sand 65 to 78 percent. The clay content below 40 cm is 17 to 31 percent. They have high chroma mottles below 28 cm. The pH of these soils range between 4.1 and 4.2. They are mostly under tea cultivation. Garopara soils are on steep slopes of hillocks under forest cover. They have fine loamy texture through depth with more than 20 percent gravels.

Interpretative grouping :

i)	Land capability subclass	IIIe
ii)	Irrigability sub class	2s.

Suitability to crops

Crop	Suitability class	Limitations
Tea	Marginally suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	50.0	30.8	19.2	26.7	23.3	-
15-36	32.5	40.1	27.4	17.2	15.3	-
36-62	40.0	27.0	33.0	16.7	23.3	-
62-104	35.5	28.4	36.1	13.1	22.4	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.78	-	5.1	-
15-36	0.48	-	4.8	-
36-62	0.35	-	5.0	-
62-104	0.30	-	5.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-15	1.80	0.10	0.20	1.2	1.4	5.0	42	0.26
15-36	1.15	0.10	0.15	2.4	1.8	6.0	23	0.22
36-62	1.10	0.10	0.10	2.8	2.2	6.8	19	0.21
62-104	1.00	0.10	0.10	3.4	2.0	7.1	17	0.20

85. SINGRA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquept.*
Type location	:	25°51'21"N latitude, 91°9'48"E longitude; Village Singra, Police Station – Boko; District Kamrup, Assam.
Profile No.	:	780 BKW-108
Physiographic position	:	Very gently sloping flood plains in Kamrup district
Elevation (m)	:	60 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	1950 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is moderately low
Land use and vegetation	:	Mostly under paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Kamrup district (18,187 ha)
Soil series associated	:	Ambari and Bharatpur

Typifying pedon : Singra loam – cultivated.

Ap	0-15 cm	Brown (10YR 5/3 M) loam; puddled; friable and slightly sticky; common strong brown (7.5YR 5/8) rustly specks of decomposing roots; many fine and few medium roots; common fine and few medium pores; moderately acid (pH 5.8); gradual smooth boundary.
Bw1	15-50 cm	Greyish brown (10YR 5/2 M) loam; moderate medium subangular blocky; friable and slightly sticky; few fine faint strong brown (7.5 YR 5/8) mottles; common fine and few medium roots; common fine pores; moderately acid (pH 5.6); clear smooth boundary.
Bw2	50-95 cm	Dark greyish brown (10YR 4/2 M) loam; moderate medium subangular blocky; common medium distinct yellowish red (5YR 5/8) mottles; few fine and medium roots; moderately acid (pH 5.6); clear smooth boundary.
C	95-120 cm	Yellowish red (5YR 5/6 M) sandy clay loam; massive; firm and sticky; common medium distinct dark grey (10YR 4/1) mottles; few fine roots; moderately acid (pH 5.6).

Range in characteristics : Singra soils are very deep. The A horizon is 15-20 cm thick. Its colour is in hue 10 YR, value 4 to 5 and chroma 2 to 3. The texture is loam or sandy clay loam. The B horizon is 80-100 cm thick. Its colour is in hue 10YR, value 4 to 5 chroma 1 to 2, it is distinctly mottled. The texture is loam or silt loam or sandy clay loam. The structure is subangular blocky. The C horizon occurs below 90-120 cm. Its colour is in the hue 5YR, 7YR or 10YR, value 5 to 6 and chroma 4 to 6. Low chroma mottles are common. It does not have well developed structure.

Competing series and their differentiae: Teok series identified in Jorhat district and Garopara series identified in Goalpara district are competing series. The Teok soils have sandy loam texture upto 40 cm, with 8-10% clay and sand 65 to 78 percent. The clay content below 40 cm is 17 to 31 percent. They have high chroma mottles below 28 cm. The pH of these soils range between 4.1 and 4.2. They are mostly under tea cultivation. Garopara soils are on steep slopes of hillocks under forest cover. They have fine loamy texture through depth with more than 20 percent gravels.

Interpretative grouping :

i)	Land capability subclass	IIIw
ii)	Land Irrigability sub class	2d.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, coarse texture, low fertility
Wheat, potato, tomato, beans, cowpea	Moderately suitable	Low pH, low organic matter, low fertility
Cabbage, pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	41.0	35.5	23.5	22.6	18.4	-
15-50	40.5	37.4	22.1	21.5	19.0	-
50-95	40.0	39.8	20.2	17.5	22.5	-
95-150	54.6	21.4	24.0	12.4	42.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.27	-	5.8	-
15-50	1.10	-	5.6	-
50-95	0.50	-	5.6	-
95-150	0.45	-	5.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	7.5	0.2	0.1	0.30	0.15	9.1	85	0.38
15-50	6.5	0.2	0.1	0.55	0.40	8.5	80	0.38
50-95	5.2	0.15	0.1	0.65	0.40	6.9	79	0.34
95-150	4.5	0.15	0.1	0.45	0.35	6.2	77	0.26

86. DUDHNAI SERIES

Classification	:	Fine, mixed, hyperthermic *Oxyaquic Dystrudepts*.
Type location	:	25°55'13"N latitude, 90°45'7"E longitude; Village Singimari, district Goalpara, Assam.
Profile No.	:	78 K / GAN 24
Physiographic position	:	Gently sloping old flood plains in Goalpara district
Elevation (m)	:	30-35 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Moderately well drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Mostly under grass land. Rice and vegetable crops are cultivated at some places.
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Goalpara district (11,480 ha)
Soil series associated	:	Krishnai

Typifying pedon : Dudhnai silt loam - grassland.

A	0-20 cm	Greyish brown (10YR 5/2 M) silt loam; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; many fine roots; moderately acid (pH 5.7); clear smooth boundary.
Bw1	20-42 cm	Dark yellowish brown (10YR 4/6 M) silty clay loam; common medium distinct brown to dark brown (7.5YR 4/2) redox depletions; weak fine subangular blocky structure; friable, sticky and plastic; common fine pores; few fine roots; moderately acid (pH 5.6); gradual smooth boundary.
Bw2	42-102 cm	Yellowish brown (10YR 5/8 M) clay; moderate medium subangular blocky; friable sticky and plastic; few medium and many fine pores; few red soft iron manganese concretions; few fine roots; strongly acid (pH 5.5); gradual smooth boundary.
C	102-127 cm	Yellowish brown (10YR 5/4 M) clay; common fine faint yellowish brown (10YR 5/8) mottles; massive structure; firm very sticky and lastic, common fine pores; few red soft iron manganese concretions; moderately acid (pH 5.7).

Range in characteristics : Dudhnai soils are very deep. The A horizon is 15-20 cm thick. Its colour is in the hue 10YR, value 4 to 6, chroma 2 to 3. The texture is silty clay loam or silt loam. The stucture is weak or moderate medium subangular blocks. This horizon has very high amount of fibrous roots. The B horizon is 80 to 100 cm thick and has two or more subhorizons. The colour is in the hue of 10YR, value 4 to 6, chroma 6 to 8. The texture is silty clay loam or clay with more than 35 percent clay. The structure is weak or moderate, fine or medium, subangular blocks. The lower part of B horizon is generally massive. The C horizon is generally below the depth of 100 cm. Its colour is in the hue 10YR, value 4 to 6, chroma 6 to 8. The texture is clay.

The structure is massive. The upper part of B horizon (40-50 cm) has redoximorphic depletions. Redoximorphic concentrations with chroma 6 to 8 are observed below 100 cm. These soils are either strongly acid or moderately acid with pH ranging between 5 and 6.

Competing series : The Naharbari series identified in Sibsagar district is a competing series. Naharbari soils have silt content 17 to 37 percent. The pH of Naharbari soil is 4.7 to 4.9.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low organic matter, low fertility
Beans	Suitable	No limitation
Wheat, mustard, tomato, potato, cowpea	Moderately suitable	Low pH, low organic matter, low fertility
Cabbage, pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	10.8	62.7	26.5	2.4	8.4	-
20-42	10.3	51.7	38.0	2.5	7.8	-
42-102	7.1	39.4	53.5	1.9	5.2	-
102-127	11.4	37.6	51.0	2.7	8.7	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	1.42	-	5.7	-
20-42	0.74	-	5.6	-
42-102	0.78	-	5.5	-
102-127	0.19	-	5.7	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	2.52	0.35	0.08			6.4	46.09	0.24
20-42	3.30	0.48	0.12			7.94	49.12	0.21
42-102	4.27	0.65	0.23			10.75	47.91	0.20
102-127	6.01	0.74	0.28			11.52	61.2	0.23

87. GOALPARA SERIES

Classification	:	Fine, mixed, hyperthermic family of *Humic Endoaquepts.*
Type location	:	26°5'30"N latitude, 93°36'53"E longitude; Village Khagrabari, district Goalpara, Assam.
Profile No.	:	78 J / GAN37
Physiographic position	:	low lands of older flood plains in Goalpara district.
Elevation (m)	:	20-30 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Level to very gently sloping (0-1% slope), slightly eroded
Drainage & permeability	:	Poorly drained in rainy season, improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy .
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Goalpara district (7,223 ha)
Soil series associated	:	Jinjiram and Lakhipur

Typifying pedon : Goalpara silty clay - cultivated.

Ap	0-19 cm	Dark greyish brown (10YR 4/2 M) silty clay; weak, coarse, subangular blocky structure; friable, sticky and plastic; common, fine pores; common, fine roots, very strongly acid (pH 4.8), clear smooth boundary.
Bw1	19-42 cm	Brown to dark brown (10YR 4/3 M) clay; weak, coarse, angular blocky structure, friable, sticky and plastic; many, fine pores; few, fine roots; very strongly acid (pH 5.0); clear smooth boundary.
Bw2	42-76 cm	Dark greyish brown (10YR 4/2 M) clay; few fine distinct yellowish brown (10YR 5/6) mottles; massive structure; firm, sticky and plastic; common, fine pores; few, very fine roots; few, dark brown, soft iron manganese concretion; strongly acid (pH 5.2); gradual smooth boundary.
Bw3	76-115 cm	Dark grey (10YR 4/1 M) clay; common fine distinct strong brown (7.5YR 5/8) mottles; massive structure; firm, sticky and plastic; very few very fine roots; strongly acid (pH 5.3); clear smooth boundary.
C	115-170 cm	Very dark grey (10YR 3/1 M) clay; few fine distinct yellowish brown (10YR 5/6) mottles; massive structure; firm, very sticky and very plastic; few black hard iron-manganese concretions; strongly acid (pH 5.5).

Range in characteristics : Goalpara soils are very deep. The A horizon is 15 to 20 cm thick. Its colours is in the hue 10YR, value 3 to 4, chroma 1 to 2. The texture is silty clay loam or silty clay. The structure is weak or moderate, medium or coarse, subangular blocks. The B horizon is 80 to 100 cm thick and has 2 or more sub horizons. Its colour is in hue 10YR, value 3 to 4, chroma 1 to 3. The structure is moderate or weak medium or coarse, subangular blocks. However, the lower B horizon does not have well developed structure in some locations. B horizon have soft Fe-Mn concretions and high chroma mottles. The C horizon generally is below a depth of 100 cm. Its colour in the hue 10YR, value 3 to 4, chroma 1to 2. It does not have structural development. It

has Fe-Mn concretions and high chroma mottles. These soils are very strongly acid upto 50 cm and thereafter strongly acid. The root distribution is concentrated in surface horizon, up to 20 cm and the amount of roots decrease down the depth.

Competing series : Rowriah series identified in Jorhat district is competing series. Rowriah soils have clay content of 35 to 41 percent through depth.

Intertpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low fertility
Wheat, mustard, cabbage, tomato, potato, pea, bean, cowpea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-19	8.5	47.8	43.7	5.0	3.5	-
19-42	18.0	30.2	51.8	4.9	13.1	-
42-76	14.4	27.1	58.5	3.2	11.2	-
76-115	20.5	19.5	60.0	10.4	10.1	-
115-170	5.5	27.3	67.2	2.1	3.4	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-19	2.30	-	4.8	-
19-42	0.75	-	5.0	-
42-76	0.75	-	5.2	-
76-115	0.88	-	5.3	-
115-170	1.06	-	5.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^+	K^+					
	$cmol(p^+)kg^{-1}$							
0-19	4.22	0.91	0.28	0.14	1.5	13.31	40.65	0.30
19-42	3.26	0.78	0.24	0.23	2.5	11.26	38.01	0.22
42-76	4.22	0.74	0.15	0.24	1.4	13.57	37.65	0.23
76-115	7.49	0.96	0.21	0.30	0.7	16.13	53.68	0.27
115-170	NA	NA	NA	0.24	0.4	NA	NA	NA

88. GAROPARA SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Hapludalfs*.
Type location	:	25°56'35"N latitude, 90°54'0"E longitude; Village Gabilpara, district Goalpara, Assam
Profile No.	:	78 K / GAN 28
Physiographic position	:	Moderately steep hill slopes
Elevation (m)	:	100-140 m above MSL
Groundwater table	:	>10 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Moderately steeply sloping (15-30% slope), moderately eroded
Drainage & permeability	:	Excessively drained and Saturated hydraulic conductivity is moderately low
Land use and vegetation	:	Soils are not put to any economical use. Natural vegetation :grasses and tree species like *Shorea robusta, Terminalia bellerica, Lagerstroemia parviflora, Schima wallichii, Stereospermum personatum.*
Geology and parent material	:	Weathered sandstone
Distribution and extent	:	Extensive in Goalpara district (7,666 ha)
Soil series associated	:	Ranjuli

Typifying pedon: Garopara loam – fallow.

A	0-22 cm	Dark yellowish brown (10YR 3/4 M) loam; moderate, fine, subangular blocky structure; very friable, slightly sticky and non plastic; common, fine pores; few, medium and common, fine roots; 10 percent gravels of less than 2.5cm size, moderately acid (pH 5.7); clear smooth boundary.
Bw1	22-60 cm	Brown to dark brown (7.5YR 4/4 M) clay loam; moderate, fine, subangular blocky structure; very friable, sticky and slightly plastic; few, medium and common, fine pores; few medium and common fine roots; 15 percent gravels less than 2.5 cm size and 5 percent gravels of 2.5 to 7.5 cm size; very strongly acid (pH 5.0); gradual smooth boundary.
Bw2	60-85 cm	Reddish brown (5YR 4/4 M) sandy clay loam; moderate, medium, subangular blocky structure; friable, sticky and plastic; few, medium and common, fine pores; few, fine roots; 20 percent gravels of 2.5 to 7.5 cm size and 10 percent stones of more than 7.5 cm size; strongly acid (pH 5.2); gradual smooth boundary.
C	85-115 cm	Reddish brown (5YR 4/4 M) sandy clay loam; moderate, medium, subangular blocky structure; friable, sticky and plastic; common, fine pores; 35 percent gravels of 2.5 to 7.5 cm size and 5 percent stones of more than 7.5 cm size; strongly acid (pH 5.1).

Range in characteristics : Garopara soils are deep. The A horizon is 15 to 25 cm thick. Its colours is in the hue 10YR, value 3 to 4, chroma 3 to 4. The texture is loam. Structure is moderate or weak, medium or fine, subangular blocks. The B horizon is 50 to 70 cm thick and 2 or more sub horizons. Its colour is in the hue 7.5YR or 5YR, value 4 to 6, chroma 4 to 6. The texture is generally clay loam in the upper part and sandy clay loam in lower B horizon. The structure is moderate, medium or fine, subangular blocks. The soil reaction varies in the different horizons. The surface is moderately acid while the subsoils are strongly or very strongly acid. The content of coarse fragments increases with depth from 10 percent in the A horizon to 35 perce in the C horizon which is generally below 80 cm. The roots are concentrated in surface horizons and the amount decreases donwnwards.

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-22	42.6	35.4	22.0	8.2	34.4	10
22-60	39.7	23.3	37.0	6.0	33.7	20
60-85	47.8	20.2	32.0	6.5	41.3	30
85-115	46.2	22.6	31.2			35

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-22	1.27	-	5.7	-
22-60	0.52	-	4.9	-
60-85	0.26	-	5.2	-
85-115	0.06	-	5.1	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-22	4.46	0.87	0.28			8.45	66.4	0.38
22-60	3.21	0.86	0.28			8.22	53.0	0.22
60-85	2.30	0.65	0.28			8.70	37.1	0.27
85-115	2.30	0.61	0.28			7.68	41.5	0.25

89. JINJIRAM SERIES

Classification	:	Coarse loamy, mixed, hyperthermic family of *Aeric Fluvaquents*.
Type location	:	25°57'16"N latitude, 91°4'30"E longitude; village Kakriganj, Goalpara, Assam
Profile No.	:	78 K / GAN 53
Physiographic position	:	Active flood plains of the various tributaries of the Brahmaputra in the districts of Goalpara
Elevation (m)	:	20-40 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Somewhat poorly drained in rainy season , improves in post rainy period and Saturated hydraulic conductivity is moderately low
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Goalpara district (17,866 ha)
Soil series associated	:	Goalpara and Lakhipur

Typifying pedon : Jinjiram silt loam - cultivated.

Ap	0-17 cm	Dark greyish brown (2.5Y 4/2 M), silty loam; weak fine subangular blocky structure, slightly sticky and slightly plastic; common, fine pores; common, fine roots; slightly acid (pH 6.4); clear smooth boundary.
C1	17-75 cm	Greyish brown (2.5Y 5/2 M) loamy sand; single grain structure; very friable, non sticky and non plastic; common, fine roots; neutral (pH 6.9); abrupt smooth boundary.
C2	75-135 cm	Very dark greyish brown (2.5Y 3/2 M) loam; massive structure; slightly sticky and non plastic; few, fine pores; common, fine roots, slightly alkaline (pH 7.5), clear smooth boundary.

Range in characteristics : The Jinjiram soils are very deep. The A horizon is 15 to 20 cm thick. Its colours is in the hue 2.5Y or 10YR, value 4 to 5, chroma 2 to 3. The texture is silty loam or sand loam or even loamy sand. The structure is mostly weak, fine or medium, subangular blocks. In some locations, the structure remain single grained. The C horizon occurs below a depth of 15 to 20 cm and has two or more subhorizons. Its colour is in the hue 2.5Y or 10YR, value 3 to 5, chroma 1 to 2. The texture varies widely among loamy sand, sandy loam, loam and silt loam. The C horizons have no structural development. The structure is single grain when the texture is loamy sand or coarser or massive when the texture is sandy loam or finer. The surface horizon is slightly acid while the C horizons are neutral or slightly alkaline.The roots are concentrated in the surface horizon and noticed up to a depth of generally 100 cm.

Competing series : Lahangaon series identified in Jorhat district and Rupahi series identified in Nagaon district are competing series. The Lahangaon soils have pH of 7.4 to 7.9 and also traces of $CaCO_3$. Rupahi soils have pH of 6.0 to 6.5. They have sand content of 77 to 80 percent with depth.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-17	21.0	52.6	26.4	14.3	6.7	-
17-75	82.5	11.7	5.8	3.7	78.8	-
75-135	50.0	31.8	18.2	42.6	7.4	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-17	0.47	-	6.4	-
17-75	0.08	-	6.9	-
75-135	0.17	-	7.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-17	1.8	0.24	0.05			3.2	65.31	0.12
17-75	1.6	0.26	0.05			1.8	100.0	0.31
75-135	4.2	0.31	0.09			4.0	100.0	0.22

90. KRISHNAI SERIES

Classification	:	Fine, mixed, hyperthermic family of *Aeric Endoaquepts*.
Type location	:	25°58'38"N latitude, 90°48'0"E longitude; village Charaimari, district Goalpara, Assam.
Profile No.	:	78 K / GAN 27
Physiographic position	:	Very gently sloping or gently sloping piedmonts
Elevation (m)	:	30-40 m above MSL
Groundwater table	:	< 1 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Poorly drained in rainy season , improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Goalpara district (24,077 ha)
Soil series associated	:	Dudhnai

Typifying pedon: Krishnai loam - cultivated.

Ap	0-16 cm	Grey (10YR 5/1 M) loam; weak medium subangular blocky Structure; friable, slightly sticky and non plastic; few, fine pores; many, fine roots; strongly acid (pH 5.3); clear smooth boundary.
Bw1	16-45 cm	Yellowish brown (10YR 5/8 M) clay loam; many fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable sticky and plastic; many, fine pores; few, fine roots; slightly acid (pH 6.2); gradual smooth boundary.
Bw2	45-70 cm	Greyish brown (10YR 5/2 M) silty clay; many medium distinct strong brown (7.5YR 5/6) mottles; massive structure; firm, sticky and plastic; few, hard iron concretions; neutral (pH 6.7); gradual smooth boundary.
BC	70-120 cm	Grey (10YR 5/1 M) silty clay; massive structure; firm sticky and plastic; few, very fine pores; many, hard iron concretions; neutral (pH 6.6).

Range in characteristics : Krishnai soils are very deep. The A horizon is 15-20 cm thick. Its colour is in hue 10YR, value 4 to 6, chroma 1 to 2. The texture is sandy loam or loam. The structure is weak or moderate, fine or medium subangular blocks. The B horizon is 50 to 75 cm thick and has 2 or more sub horizons. It has colours in hue 10YR value 4 to 6, chroma 2 to 3. The texture is clay loam or silty clay. The structure is moderate medium subangular blocks in the upper part of the horizons and massive in the lower parts. The C horizon generally is below a depth of 90 cm. Its colour is in hue 10YR, value 4 to 6, chroma 1 to 2. The structure is massive. Redox concentrations with chroma 4 to 6 are observed in B horizon. Fe Mn concretions occur below the depth of 45 cm. The surface horizon is strongly acid while the sub soils are slightly acid to neutral. The root distribution is concentrated in surface layer and it decreases with depth.

Competing series and their diffcrentiae : Moindra series identified in Kamrup district is competing series. Moidra soils have clay content of 39 to 50 percent. The pH ranges between 5.5 and 5.9, increasing with depth.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, coarse texture, low fertility
Potato	Moderately suitable	Low pH, low organic matter, low fertility
Wheat, mustard, tomato, beans, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-16	35.5	45.5	19.0	7.6	27.7	-
16-45	24.2	42.8	33.0	5.0	19.2	-
45-70	12.8	44.7	42.5	3.3	9.5	-
70-120	17.3	40.7	42.0	3.2	14.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-16	0.91	-	5.3	-
16-45	0.31	-	6.2	-
45-70	0.29	-	6.7	-
70-120	0.19	-	6.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-16	2.88	0.65	0.14			5.63	65.18	0.29
16-45	4.99	0.61	0.14			7.68	74.74	0.23
45-70	6.53	0.42	0.17			9.22	77.22	0.22
70-120	3.84	0.70	0.20			9.23	51.35	0.22

91. LAKHIPUR SERIES

Classification	:	Fine-silty, mixed, hyperthermic *Aeric Fluvaquents*.
Type location	:	26°1'39"N latitude, 90°18'49"E longitude; Village Lakhipur , district Goalpara, Assam.
Profile No.	:	78 J / GAN 17
Physiographic position	:	Undulating low lands of recent flood plains in Goalpara district.
Elevation (m)	:	20-30 m above MSL
Groundwater table	:	1.5 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Undulating, very slight erosion
Drainage & permeability	:	Somewhat poorly drained in rainy season , improves in post rainy period and Saturated hydraulic conductivity is low
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Goalpara (16,051ha), Cachar (14,942 ha) and Karimganj (29,768 ha) districts
Soil series associated	:	Goalpara and Jinjiram

Typifying pedon: Lakhipur loam - cultivated.

Ap	0-12 cm	Grey (10YR 5/1 M) loam; massive structure; firm sticky and plastic, common fine pores, common fine roots, strongly acid (pH 5.5); clear smooth boundary.
C1	12-52 cm	Very dark grey to very dark greyish brown (2.5Y 3/1 M) clay Loam; massive structure; very firm, very sticky and plastic; few medium and many fine pores; common fine roots; neutral (pH 7.0); clear smooth boundary.
C2	52-75 cm	Light olive brown (2.5Y 5/4 M) loam; massive structure; friable, slightly sticky and non plastic; common fine pores; slightly alkaline (pH 7.4); gradual smooth boundary.
C3	75-128 cm	Light olive brown (2.5Y 5/4 M) sandy loam; massive structure; friable, slightly sticky and non plastic; common, fine pores; slightly alkaline (pH 7.5); clear smooth boundary.
C4	128-145 cm	Yellowish brown (10YR 5/6 M) loam; massive structure; friable, slightly sticky and non plastic; common fine pores; slightly alkaline (pH 7.5); clear smooth boundary.

Range in characteristics : The Lakhipur soils are very deep. The A horizon is 12 to 20 cm thick. It has colours in hue 10YR, value 4 to 6, chroma 1 to 2. The texture is loam or sandy loam. The structure is massive due to puddling. The C horizon is generally below 15 to 20 cm and has 3 or more sub horizons. Its colour is in hue 10YR or 2.5Y, value 3 to 5, chroma 2 to 6. The textures vary from clay loam-loam-sandy loam due to stratifiction. It has no structural development. The

surface horizon is strongly acid while the sub soils are neutral or slightly alkaline. The roots are concentrated in the surface up to the depth of 15 cm and then decreases with depth.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Coarse texture, low fertility
Mustard, potato, bean	Moderately suitable	Low pH, low fertility
Wheat, cabbage, tomato, beans, cowpea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-12	24.5	48.5	27.0	17.3	7.2	-
12-52	23.1	44.4	32.5	17.5	5.6	-
52-75	43.9	41.1	15.0	32.6	11.3	-
75-128	54.5	36.0	9.5	33.2	21.3	-
128-145	43.0	43.5	13.5	25.8	17.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-12	1.76	-	5.5	-
12-52	0.92	-	7.0	-
52-75	0.21	-	7.4	-
75-128	0.12	-	7.5	-
128-145	0.15	-	7.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-12	5.67	0.56	0.06			8.89	70	0.33
12-52	11.45	0.55	0.05			12.54	96	0.38
52-75	11.06	0.56	0.02			8.44	100	0.56
75-128	11.64	0.52	0.01			6.16	100	0.65
128-145	13.97	0.52	0.02			9.35	100	0.69

92. RANJULI SERIES

Classification	:	Loamy skeletal, mixed, hyperthermic *Dystric Eutrudepts*
Type location	:	26°4'0"N latitude, 93°33'45"E longitude; Village Dalek , District Goalpara, Assam
Profile No.	:	GAN 34
Physiographic position	:	Steep, severely eroded northern escarpments of Meghalaya plateau
Elevation (m)	:	150-200 m above MSL
Groundwater table	:	>10 m
Rainfall	:	2044 mm
Slope, erosion &relief	:	Steeply sloping (30-50% slope), severely erosion
Drainage & permeability	:	Excessively drained and Saturated hydraulic conductivity is low
Land use and vegetation	:	Remain under natural conditions. Natural vegetation :grasses and tree species like *Shorea robusta, Terminalia bellerica, Lagerstroemia parviflora, Schima wallichii, Stereospermum personatum*
Geology and parent material	:	Weathered sandstone
Distribution and extent	:	Extensive in Goalpara district (1,024 ha)
Soil series associated	:	Garopara

Typifying pedon: Ranjuli gravelly sandy loam - forest.

A	0-22 cm	Very dark greyish brown (10YR 3/2 M) gravelly sandy loam; moderate fine subangular blocky structure; friable non sticky and non plastic; few, medium and common fine pores; common, medium and fine roots; 55 percent fine gravels; coarse gravels and stones; moderately acid (pH 6.0); clear smooth boundary.
Bw1	22-64 cm	Brown to dark brown (7.5YR 4/4 M) gravelly sandy clay loam; moderate fine subangular blocky structure; friable, sticky and slightly plastic; few medium and common fine pores; few coarse, medium and fine roots; 70 percent fine gravels, coarse gravels and stones; moderately acid (pH 5.6); clear smooth boundary.
Bw2	64-100 cm	Brown to dark brown (7.5YR 4/4 M) gravelly sandy clay loam; weak fine subangular blocky structure; firm sticky and plastic; few medium and fine pores; common coarse and common medium roots; 80 per cent fine gravels, coarse gravels and stones; moderately acid (pH 5.6); clear smooth boundary.
C	100-130 cm	Yellowish brown (10YR 5/4 M) gravelly sand; weak medium subangular blocky structure; non sticky and non plastic, 80 percent fine gravels, coarse gravels and stones; moderately acid (pH 5.6).

Range in characteristics: The Ranjuli soils are deep. The A horizon is 15 to 25 cm thick. Its colours is in hue 10YR, value 3 to 4, chroma 2 to 3. The texture is sandy loam or sandy clay loam. The structure is moderate or weak fine subangular blocks. It has 55 percent coarse fragments. The

B horizon is 60 to 80 cm thick and has 2 or more sub horizons. Its colour is in hue 7.5YR, value 4 to 5, chroma 4. The texture is sandy clay loam. The structure is moderate or weak, fine, subangular blocks. This horizon has 70 to 80 percent coarse fragments. The C horizon occurs below a depth of 100 cm in most places. Its colour is in the hue 10YR, value 5 to 6, chroma 4. The texture is loamy sand or sand with more than 80 percent coarse fragments. The structure is very weak or not developed. Ranjuli soils are moderately acid throughout the depth. The roots are mostly fibrous and are concentrated to a depth of 25 cm.

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-22	59.5	32.8	7.7	6.2	53.3	55
22-64	54.0	22.5	23.5	6.8	47.2	70
64-100	56.5	14.2	29.3	13.6	42.9	80
100-130	87.5	12.0	0.50	9.4	78.1	80

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-22	1.04	-	6.0	-
22-64	0.55	-	5.6	-
64-100	0.43	-	5.6	-
100-130	0.06	-	5.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-22	4.22	0.61	0.56			7.94	67	1.03
22-64	4.22	0.70	0.49			8.45	64	0.36
64-100	2.88	0.61	0.43			8.70	45	0.30
100-130	0.96	0.70	0.25			3.33	57	-

93. HEMAITARANGAON SERIES

Classification	:	Fine loamy, mixed hyperthermic family of *Fluventic Dystrudepts*.
Type location	:	26°20'10"N latitude, 93°49'30"E longitude; village Hemaitarangaon, district Karbi Anglong, Assam.
Profile No.	:	83 F / AKT-69
Physiographic position	:	Nearly level floodplain uplands in Karbi Anglong district
Elevation (m)	:	70 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1318 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slightly eroded
Drainage & permeability	:	Moderately well drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Cultivated to rice in the rainy season and vegetable crops in the winter.
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Karbi Anglong district (13,680 ha)
Soil series associated	:	Japrijan

Typifying pedon: Hemaitarangaon sandy loam – cultivated.

Ap	0-13 cm	Dark greyish brown (2.5Y 4/2 M) sandy loam; weak coarse subangular blocky structure; friable and slightly sticky; common fine roots; strongly acid (pH 5.2); gradual smooth boundary.
Bw1	13-46 cm	Light olive brown (2.5Y 5/4 M) sandy loam; weak coarse subangular blocky structure; friable and slightly sticky; few fine roots; strongly acid (pH 5.5); gradual smooth boundary.
Bw2	46-63 cm	Dark yellowish brown (10YR 4/4 M) sandy clay loam; moderate medium subangular blocky structure; friable and slightly sticky; few fine roots; moderately acid (pH 5.8); gradual smooth boundary.
Bw3	63-77 cm	Dark yellowish brown (10YR 4/6 M) clay loam; common faint medium yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable and sticky; fine roots; moderately acid (pH 5.6); gradual smooth boundary.
C	77-132 cm	Dark yellowish brown (10YR 4/6 M) clay loam; massive structure; friable and slightly sticky; 20 to 30 percent fine gravels; moderately acid (pH 5.7).

Range in characteristics : Hemaitarangaon soils are very deep. The A horizon is 12 to 25 cm thick. Its colour is in the hue 2.5Y or 10YR, value 4 to 5 and chroma 2 to 3. The texture is sandy loam or loamy sand. It has coarse weak subangular blocky structure. The B horizon is 50 to 70 cm thick and has 2 or more sub horizons. Its colour is in the hue 10YR or 2.5Y, value 4 to 5, chroma 4 to 6. High chroma mottles in the hue 10YR are observed. The texture is generally clay loam

with occasional occurrence of sandy clay loam. The structure is moderate medium subangular blocky in the upper part and massive in the lower part. The C horizon occurs below a depth of 70 to 80 cm. Its colour is in the hue 10YR, value 4 to 6 and chroma 4 to 6. Its texture is clay loam with 20 to 30 percent fine gravels. There is no structural development in C horizon. These soils are strongly to moderately acid with pH ranging between 5.2 to 5.8 and have less than 60 percent bas saturation throughout the depth. Root distribution is observed up to a depth of 70 cm.

Competing series : No competing series is identified.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, low fertility
Potato	Moderately suitable	Low pH, low fertility
Wheat, mustard, tomato, beans	Marginally suitable	Low pH, low fertility
Cabbage, cowpea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	58.5	24.5	17.0	6.5	52.0	-
13-46	56.4	25.1	18.5	5.6	50.8	5
46-63	47.2	24.3	28.5	5.0	42.2	20
63-77	43.8	22.7	33.5	4.0	39.8	30
77-132	36.4	25.1	38.5	3.5	32.9	30

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	1.23	-	5.2	-
13-46	0.48	-	5.5	-
46-63	0.35	-	5.8	-
63-77	0.38	-	5.6	-
77-132	0.35	-	5.7	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-13	2.2	0.38	0.23	0.46	0.54	6.0	47	0.35
13-46	2.2	0.52	0.15	0.31	0.09	5.0	57	0.27
46-63	3.2	0.42	0.21	0.21	0.09	6.8	56	0.24
63-77	3.6	0.52	0.23	0.36	0.54	7.5	58	0.22
77-132	4.0	0.42	0.26	0.44	0.36	8.6	54	0.22

94. JAPRIJAN SERIES

Classification	:	Fine, mixed, hyperthermic family of *Fluvaquentic Endoaquepts.*
Type location	:	26°12'0"N latitude, 93°48'45"E longitude; village Bildipan, district Karbi Anglong, Assam
Profile No.	:	83 F / AKT-79
Physiographic position	:	Plains of interhill valley in Karbi Anglong district
Elevation (m)	:	60 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1318 mm
Slope, erosion &relief	:	Nearly level to very gently sloping (0-1% slope), slightly eroded
Drainage & permeability	:	Poorly drained in rainy season , improves in post rainy period. The saturated hydraulic conductivity is very low.
Land use and vegetation	:	Rice , mustard, vegetables
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Karbi Anglong district (1,600 ha)
Soil series associated	:	Hemaitarangaon

Typifying pedon : Japrijan silty clay loam – cultivated.

Ap	0-17 cm	Dark yellowish brown (10YR 4/4 M) silty clay loam; moderate coarse subangular blocky; firm, sticky and slightly plastic; many fine yellowish brown (10YR 5/6) mottles; many fine roots; very strongly acid (pH 4.5); clear smooth boundary.
Bw1	17-45 cm	Yellowish brown (10YR 5/4 M) silty clay; moderate medium subangular blocky structue; firm, very sticky and plastic; common fine roots; strongly acid (pH 5.2); gradual smooth boundary.
Bwg1	45-75 cm	Grey (10YR 5/1 M) silty clay; moderate medium subangular blocky structure; firm, very sticky and plastic; many fine yellowish brown (10YR 5/8) mottles; few fine roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bwg2	75-110 cm	Light grey (10YR 6/1 M) clay; massive structure; firm, very sticky and plastic; many medium yellowish brown (10YR 5/8) mottles; very strongly acid (pH 4.8); diffused smooth boundary.
Cg	110-130 cm	Light grey (10YR 6/1 M) clay; massive structure; firm, very sticky and plastic; many coarse yellowish brown (10YR 5/8) mottles; very strongly acid (pH 4.7).

Range in characteristics : The Japrijan soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 5 and chroma 3 to 4. The texture is silty clay loam or silt loam. The structure is moderate, coarse or medium, subangular blocks. The B horizon is 75 to 90 cm thick and has 2 or more subhorizons. Its colour is in the hue 10YR, value 5 to 6 and chroma 1 to 2. However the upper horizon sometimes has colours in high chroma. The texture is silty clay or clay. It has high chroma mottles in hue 10YR or 7.5YR. The structure generally is moderate,

medium subangular blocky. However, the lower part of B horizon remains massive in some places. The C horizon is observed generally below a depth of 100 to 110 cm. It has colours in the hue 10YR, value 5 to 6 and chroma 1 to 2. The texture is clay or silty clay. The C horizon also has high chroma mottles in the hue 10YR or 7.5YR. Roots are observed up to a depth of 75 cm. The soils are strongly to very strongly acid throughout the depth.

Competing series : No competing series is identified.

Interpretation :

Sultability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-17	5.7	61.3	33.0	2.3	3.4	-
17-45	2.3	48.2	49.5	0.4	1.9	-
45-75	5.9	42.1	52.0	0.9	5.0	-
75-110	1.9	36.1	62.0	0.3	1.6	-
110-130	2.0	27.0	71.0	0.2	1.8	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-17	1.18	-	4.5	
17-45	0.46	-	5.2	
45-75	0.71	-	5.0	
75-110	0.40	-	4.8	
110-130	0.40	-	4.7	

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-17	5.20	0.43	0.23	1.09	1.71	7.62	76.9	0.23
17-45	8.20	0.61	0.14	0.79	1.71	11.54	77.6	0.23
45-75	8.00	0.65	0.21	1.63	5.67	19.98	44.3	0.38
75-110	6.40	0.65	0.23	1.46	5.04	14.83	49.0	0.24
110-130	6.80	0.74	0.23	1.36	5.94	15.24	50.9	0.21

95. NAMBAR SERIES

Classification	:	Fine, mixed, hyperthermic family of *Typic Paleustult.*
Type location	:	26°21'49"N latitude, 93°51'45"E longitude; Nambar Reserve forest, district Karbi Anglong, Assam.
Profile No.	:	83 F/ AKT-85
Physiographic position	:	Undulating uplands in Karbi Anglong district
Elevation (m)	:	120-1240 m above MSL
Ground water table	:	5-10 m
Rainfall	:	1318 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), moderately eroded
Drainage & permeability	:	Well drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	These soils are under forest.
Geology and parent material	:	Colluvium/ Alluvium
Distribution and extent	:	Extensive in Karbi Anglong district (1,911 ha)
Soil series correlated	:	None
Soil series associated	:	Silonijan

Typifying pedon : Nambar clay loam – forest.

A	0-22 cm	Dark yellowish brown (10YR 4/6 M) clay loam; moderate medium subangular blocky structure; friable and sticky; common fine and few coarse roots; very strongly acid (pH 4.7); clear smooth boundary.
Bt1	22-58 cm	Strong brown (7.5YR 4/6 M) clay; moderate or strong medium subangular blocky structure; friable and sticky; few medium and common fine roots; extremely acid (pH 4.3); gradual smooth boundary.
Bt2	58-95 cm	Strong brown (7.5YR 4/6 M) clay; moderate medium subangular blocks; firm and sticky; few medium and coarse roots; very strongly acid (pH 4.6); gradual smooth boundary.
Bt3	95-180 cm	Strong brown (7.5YR 4/6 M) clay; massive structure; firm and sticky; few coarse roots; very strongly acid (pH 4.9).

Range in characteristics : Nambar soils are very deep. The A horizon is 15 to 25 cm thick. It has colours is in the hue 10YR, value 4 to 5 and chroma 6. The texture is clay loam or loam or sandy loam. The structure is moderate or strong, coarse or medium subangular blocks. The B horizon is more than 100 cm thick and has 2 or more subhorizons. It has colours in the hue 7.5YR, value 4 to 5 and choma 4 to 6. The texture is clay, however sandy clay is also observed in some places. The structure is mostly moderate medium subangular blocks, however, massive structure observed below the depth of 100 to 125 cm in some places. The soils are very strongly to extremely acid throughout the depth. Coarse and medium roots are distributed up to the depth of 100 cm and below.

Competing series and their differerntiae : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-22	27.1	45.4	27.5	1.4	25.7	-
22-58	21.3	31.7	47.0	1.3	20.0	-
58-95	18.4	37.1	44.5	1.1	17.3	-
95-180	20.2	30.8	49.0	1.0	19.2	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-22	1.21	-	4.7	-
22-58	0.69	-	4.3	-
58-95	0.56	-	4.6	-
95-180	0.56	-	4.9	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-22	1.20	0.40	0.28	0.86	2.34	5.08	37	0.18
22-58	1.00	0.38	0.25	0.89	3.51	6.03	27	0.1[illegible]
58-95	0.60	0.35	0.23	0.72	3.78	5.68	21	0.13
95-180	0.80	0.33	0.22	0.67	3.33	5.35	25	0.11

96. SILONIJAN SERIES

Classification	:	Fine, mixed, hyperthermic *Ultic Haplustalfs*.
Type location	:	26°18'0"N latitude, 93°47'30"E longitude; Village Silonijan, district Karbi Anglong, Assam state.
Profile No.	:	83 F / AKT-70
Physiographic position	:	Gentle slopes of undulating uplands in Karbi Anglong district.
Elevation (m)	:	200 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	1318 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), moderately eroded
Drainage & permeability	:	Well drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	These soils are under forest, predominantly bamboo.
Geology and parent material	:	Collvium
Distribution and extent	:	Extensive in Karbi Anglong district (18,012 ha)
Soil series associated	:	Nambar

Typifying pedon: Silonijan sandy clay loam – forest.

A	0-23 m	Brown (10YR 4/3 M) sandy clay loam; strong coarse angular blocky structure; firm friable slightly sticky and non plastic; few coarse roots; strongly acid (pH 5.5); clear smooth boundary.
Bt1	23-50 cm	Strong brown (7.5YR 4/6 M) clay; moderate medium subangular blocky structure; firm, slightly sticky and non plastic; few coarse and few medium roots; strongly acid (pH 5.2); clear smooth boundary.
Bt2	50-78 cm	Strong brown (7.5YR 4/6 M) clay; common faint yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; thin patchy argillans on ped faces; firm and slightly sticky; many coarse roots; strongly acid (pH 5.3); gradual smooth boundary.
Bt3	78-120 cm	Strong brown (7.5YR 4/6 M) clay; moderate medium subangular blocky structure; firm and slightly sticky; common fine Fe-Mn concretions; thin patchy argillans on ped faces; moderately acid (pH 5.6); gradual smooth boundary.
Bt4	120-160 cm	Strong brown (7.5YR 4/6 M) clay; moderate medium subangular blocky structure; firm and sticky; thin patchy argillans on ped faces; few Fe-Mn concretions; strongly acid (pH 5.5).

Range in characteristics : Silonijan soils are very deep. The A horizon is 15 to 25 cm thick. Its colour is in the hue 10YR, value 4 to 5 and chroma 3. The texture is sandy clay loam or sandy loam. The structure is coarse, strong angular blocky or moderate medium subangular blocky.

The B horizon is more than 100 cm thick and has 2 or more sub horizons. Its colour is in the hue 7.5YR, value 4 to 6 and chroma 5 to 8. The texture is clay or sandy clay. The structure is moderate, medium or coarse, subangular blocky. Fe-Mn concretion are observed below a depth of

50 cm. Yellowish brown mottles (10YR 5/8) are observed. Medium and coarse roots are observed at a depth of 120 cm. The soils are mostly strongly acid throughout. Thin patchy argillans are observed on ped faces in some parts of B horizon.

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-23	52.9	19.1	28.0	2.3	50.6	-
23-50	35.3	22.7	42.0	1.8	33.5	-
50-78	33.8	18.7	47.5	1.8	32.0	-
78-120	31.8	25.7	42.5	1.6	30.2	-
120-160	29.2	26.3	44.5	1.2	28.0	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-23	0.98	-	5.5	-
23-50	0.59	-	5.2	-
50-78	0.50	-	5.3	-
78-120	0.48	-	5.6	-
120-160	0.18	-	5.5	-

Depth (cm)	Extractable bases			Extrac-table acidity	Extractable Al^{3+}	CEC	Exch. Acidity $Bacl_2$	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}						
	cmol(p^{+})kg^{-1}								
0-23	2.40	0.41	0.13	0.30	1.98	6.2	5.90	33	0.22
23-50	3.20	0.56	0.19	0.62	1.98	8.0	9.08	30	0.19
50-78	3.20	0.40	0.15	0.53	1.17	8.4	7.94	32	0.18
78-120	4.60	0.40	0.16	0.43	0.27	9.0	7.26	41	0.21
120-160	4.28	0.30	0.14	0.11	0.33	8.0	7.71	38	0.18

97. KALACHAND SERIES

Classification	:	Fine, mixed, hyperthermic family of *Humic Eutrudepts*.
Type location	:	25°19'0"N latitude, 93°13'0"E longitude; village Kalachand, district North Cachar Hills, Assam
Profile No.	:	83 G / TNC 48
Physiographic position	:	Undulating foothill slopes in North Cachar hill distict..
Elevation (m)	:	250 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	2277 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), moderately eroded
Drainage & permeability	:	Moderately well drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Grassland (fallow)
Geology and parent material	:	Alluvium / Colluvium
Distribution and extent	:	Extensive in North Cachar district (35,355 ha)
Soil series associated	:	Moibang and Mupa

Typifying pedon : Kalachand silty clay – fallow.

A	0-21 cm	Very dark greyish brown (10YR 3/2 M) silty clay; moderate medium subangular blocks breaking to granular structure; firm sticky and slightly plastic; many fine roots; moderately acid (pH 5.8); clear smooth boundary.
Bw1	21-38 cm	Brown (10YR 4/3 M) silty clay; moderate medium subangular blocks breaking to granular structure; firm, sticky and slightly plastic; common fine roots; strongly acid (pH 5.3); clear smooth boundary.
Bw2	38-64 cm	Dark brown (7.5YR 4/4 M) silty clay; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few fine roots; strongly acid (pH 5.5); gradual smooth boundary.
Bw3	64-91 cm	Dark yellowish brown (10YR 4/6 M) clay; moderate medium subangular blocky structure; common medium light olive brown (2.5Y 5/6) mottles; few fine roots; moderately acid (pH 5.8); gradual smooth boundary.
C	91-117 cm	Olive yellow (2.5Y 6/6 M) silty clay; massive structure; firm, very sticky and slightly plastic; slightly acid (pH 6.5).

Range in characteristics : Kalachand soils are very deep. The A horizon is 15 to 22 cm thick. Its colour is in the hue 10YR, moist value 3, chroma 2 or less. The texture is silty clay or silty clay loam. The structure is moderate medium subangular blocks which breaks to granular structure. The B horizon is 70 to 80 cm thick and has 2 or more subhorizons. The colour is in the hue 10YR or 7.5YR, value 4 to 6 and chroma 3 to 6. High chroma mottles in the hue of 2.5Y are observed. The texture ranges between silty clay and clay. The structure mostly is moderate or strong, medium subangular blocky. The C horizon generally occurs below 90 to 100 cm. Its colour is in the hue 2.5Y, value 4 to 6, chroma 4 to 6. Its texture is silty clay or clay. It generally does not have structural development. The root distribution is observed up to a depth of generally 75 cm. The soils are moderately to strongly acid.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low fertility
Potato	Moderately suitable	Low pH, low fertility
Wheat, mustard, tomato, beans, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-21	5.1	53.9	41.0	1.5	3.6	-
21-38	4.0	46.0	50.0	1.3	2.7	-
38-64	3.5	42.0	54.5	1.2	2.3	-
64-91	4.5	39.5	56.0	1.3	3.2	-
91-117	7.4	52.1	40.5	2.5	4.9	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-21	2.14	-	5.8	-
21-38	0.68	-	5.3	-
38-64	0.43	-	5.5	-
64-91	0.35	-	5.8	-
91-117	0.31	-	6.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-21	13.8	0.39	0.28	0.28	-	18.36	78.81	0.45
21-38	7.0	0.43	0.15	0.19	-	17.14	44.22	0.34
38-64	11.8	0.39	0.19	0.37	1.60	18.36	67.43	0.34
64-91	12.0	0.56	0.21	0.38	1.50	20.20	63.2	0.36
91-117	17.6	0.56	0.15	0.46	0.86	19.99	91.6	0.49

98. LANGTING SERIES

Classification	:	Fine, mixed, hyperthermic family of *Humic Dystrudepts*.
Type location	:	25°7'30"N latitude, 93°4'30"E longitude; village Borowpo, district North Cachar Hills, Assam
Profile No.	:	83 G / TNC-56
Physiographic position	:	Moderately sloping hill slopes..
Elevation (m)	:	450 m above MSL
Groundwater table	:	> 10 m
Rainfall	:	2277 mm
Slope, erosion &relief	:	Moderately sloping (8-15% slope), severely eroded
Drainage & permeability	:	Well drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	under forest vegetation
Geology and parent material	:	Colluvium
Distribution and extent	:	Extensive in North Cachar district (13,627 ha)
Soil series associated	:	Sikargaon

Typifying pedon: Langting silty clay loam - forest.

A	0-20 cm	Very dark grey (10YR 3/1 M) silty clay loam; weak, fine subangular blocky structure; friable and sticky; few coarse and many fine roots; strongly acid (pH 5.5); clear smooth boundary.
Bw1	20-56 cm	Yellowish brown (10YR 5/4 M) silty clay; moderate medium subangular blocky; friable and sticky; 10 to 15 percent coarse fragments; few coarse and common fine roots; strongly acid (pH 5.1); clear smooth boundary.
Bw2	56-73 cm	Yellowish brown (10YR 5/4 M) clay; moderate medium subangular blocky; friable and sticky; common medium yellowish brown (10YR 5/8) mottles; 10 percent coarse fragments; few coarse roots; strongly acid (pH 5.2); clear smooth boundary.
Bw3	73-120 cm	Brown (10YR 5/3 M) silt loam; massive structure; friable and sticky; 20 percent coarse fragments; strongly acid (pH 5.3).
C	120+	Unconsolidated shale and sandstone.

Range in characteristics : Langting soils are deep. The A horizon is 15 to 20 cm thick. It has colours in the hue 10YR, value 3 and chroma 1 to 2. The texture is silty clay loam or silt loam. The structure is weak moderate subangular blocky or medium moderate subangular blocks breaking to granular. The B horizon is 80 to 100 cm thick and has 2 or more sub horizons. It has colours in the hue 10YR, value 4 to 5 and chroma 3 to 4. The texture is silty clay or clay in upper horizon whereas silt loam in the lower. The structure is moderate or strong, medium or coarse subangular blocks, however massive structure is observed in lower horizons. The roots are distributed up to a depth of 73 cm. These soils are strongly acid throughout the depth.

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-20	16.6	44.4	39.0	4.3	12.3	-
20-56	16.0	42.0	42.0	3.8	12.2	20
56-73	18.2	38.8	43.0	4.1	14.1	10
73-120	23.7	51.8	24.5	7.2	16.5	20

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-20	3.0	-	5.5	-
20-56	1.4	-	5.1	-
56-73	0.81	-	5.2	-
73-120	0.16	-	5.3	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-20	8.34	0.74	0.77	0.32	0.43	14.82	66.5	0.38
20-56	1.94	0.61	0.26	0.52	5.03	12.52	22.4	0.30
56-73	2.72	0.74	0.31	0.37	4.71	11.63	32.4	0.27
73-120	3.26	0.52	0.16	0.43	2.67	7.98	49.4	0.33

99. MOIBONG SERIES

Classification	:	Loamy skeletal, mixed, hyperthermic family of *Typic Udorthents*.
Type location	:	25°42'57"N latitude, 93°7'48"E longitude; village Mondardish, district North Cachar Hills, Assam.
Profile No.	:	83 G / TNC-32
Physiographic position	:	Gently sloping foot hills and piedmont zones
Elevation (m)	:	100-200 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	2277 mm
Slope, erosion &relief	:	Very gently sloping (3-8% slope), moderately eroded
Drainage & permeability	:	Well drained. The saturated hydraulic conductivity is moderately high.
Land use and vegetation	:	Used as grassland. Natural vegetation : mixed semi deciduous type. *Artocarpus chaplasha, Dipterocarpus turbinatus, Palaquium polyanthum, Chickrasia tubularis, Adina cardifolia, Cynometra polyendra, Vitex, Pterospermium acerifolium, Melocamua bambusoides*
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in North Cachar district (25,741 ha)
Soil series associated	:	Kalachand and Mupa

Typifying pedon: Moibong sandy loam – grass land.

Ap	0-22 cm	Brown to dark brown (10YR 4/3 M) sandy loam; weak medium subangular blocky structure; slightly hard, friable, non sticky and non plastic; many fine and very fine roots; 20 percent gravels of less than 2.5 cm size; slightly acid (pH 6.4); clear smooth boundary.
C1	22-45 cm	Yellowish brown (10YR 5/4 M) sandy loam; massive Structure; very friable, non sticky and non plastic; few fine and very fine roots; 25 per cent gravels of less than 2.5 cm size; neutral (pH 6.7); gradual smooth boundary.
C2	45-72 cm	Yellowish brown (10YR 5/4 M) sandy loam; massive structure; very friable, non sticky and non plastic; few very fine roots; 35 percent gravels of size less than 7.5 cm; neutral (pH 6.9); gradual smooth boundary.
C3	72-105 cm	Yellowish brown (10YR 5/4 M) loamy sand; massive structure; very friable, non sticky and non plastic; 50 percent gravels of 2.5 to 25 cm size; neutral (pH 7.0).

Range in characteristics : The Maibong series is very deep. The A horizon is 15 to 25 cm deep. Its colour is in the hue 10YR, value 4 to 5 and chroma 3 or 4. The texture is sandy loam. The structure is weak fine or medium, subangular blocky. The C horizon is observed generally below 20 cm and has 2 or more sub horizons. It has colour in the hue 10YR value 4 to 6 and chroma 4 to 6. The texture is generally sandy loam and loamy sand is also observed in the lower part of C horizon. Significant amount of coarse fragments are present in the profile, the amount increases

from 20 percent in the surface to 50 percent at the depth of 100 cm. These soils are slightly acid at the surface and thereafter neutral. The roots are many in the surface horizon and decreases to few at the depth of 70 cm.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Marginally suitable	Low organic matter, low fertility
Wheat	Suitable	No limitation
Cabbage	Moderately suitable	Low organic matter, low fertility
Mustard, tomato, potato, beans, pea, cowpea	Marginally suitable	Low organic matter, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-22	74.7	15.3	10.0	9.1	65.6	20
22-45	74.2	10.3	15.5	8.3	65.9	25
45-72	75.9	14.1	10.0	8.3	67.6	35
72-105	73.6	22.9	3.5	7.9	65.7	50

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-22	0.53	-	6.4	-
22-45	0.18	-	6.7	-
45-72	0.05	-	6.9	-
72-105	0.08	-	7.0	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-22	3.06	0.43	0.11	0.19	-	4.33	83.1	0.43
22-45	1.84	0.43	0.07	-	-	2.66	87.9	0.17
45-72	1.43	0.41	0.04	0.09	-	1.44	100	0.14
72-105	1.43	0.40	0.25	0.09	-	1.85	100	0.52

100. MUPA SERIES

Classification	:	Fine, mixed, hyperthermic family of *Typic Paleudalfs*.
Type location	:	25°36'0"N latitude, 93°12'45"E longitude; village 12 Kilomile, district North Cachar, Assam
Profile No.	:	83 G / TNC-44
Physiographic position	:	Undulating uplands of gently sloping foothills in North Cachar hill district.
Elevation (m)	:	200-250 m above MSL
Groundwater table	:	5-10 m
Rainfall	:	2277 mm
Slope, erosion &relief	:	Gently sloping (3-8% slope), moderately eroded
Drainage & permeability	:	Excessively drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Under forest. Bamboo is the predominant plantation.
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in North Cachar district (31,447 ha)
Soil series associated	:	Kalachand and Moibang

Typifying pedon: Mupa loam – forest.

A1	0-8 cm	Dark greyish brown (10YR 4/2 M) loam; weak medium granular structure; friable, slightly sticky and slightly plastic; few coarse and many fine roots; slightly acid (pH 6.1); clear smooth boundary.
A2	8-21 cm	Yellowish brown (10YR 5/6 M) loam; moderate medium granular structure; friable and sticky; many fine roots; slightly acid (pH 6.1); clear smooth boundary.
Bt1	21-71 cm	Strong brown (7.5YR 5/6 M) clay; moderate medium subangular blocky structure; firm, sticky and slightly plastic; many fine and very fine roots; strongly acid (pH 5.4); gradual smooth boundary.
Bt2	71-106 cm	Red (2.5YR 4/6 M) clay; moderate medium subangular blocky structure; firm, sticky and slightly plastic; many fine and very fine roots; very strongly acid (pH 5.0); gradual smooth boundary.
Bt3	106-160 cm	Red (2.5YR 4/6 M) clay; moderate medium subangular blocky structure; firm, sticky and slightly plastic; many very fine roots; strongly acid(pH 5.5).

Range in characteristics : Mupa soils are very deep. The A horizon is 15 to 25 cm thick. Its colour is in the hue 10YR, value 4 to 6 and chroma 2 to 6. The texture is loam or sandy clay loam. The structure is weak, subangular blocks breaking to granular. The B horizon is more than 100 cm thick and has 2 or more sub horizons. The upper part of B horizon has colours in the hue 7.5 YR or 5YR, value 5 to 6, chroma 4 to 6. The structure is moderate, medium, subangular blocks breking to granular. The lower part of B horizon has colours in the hue 2.5 YR, value 4 to 6 and chroma 6 to 8. The texture is generally clay. The structure mostly is moderate medium subangular

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-8	37.9	36.1	26.0	11.7	26.2	-
8-21	32.5	41.0	26.5	8.8	23.7	-
21-71	27.4	28.1	44.5	7.6	19.8	-
71-106	19.5	24.5	56.0	4.2	15.3	-
106-160	20.0	30.0	50.0	4.9	15.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-8	1.64	-	6.1	-
8-21	0.94	-	6.1	-
21-71	0.74	-	5.4	-
71-106	0.41	-	5.0	-
106-160	0.47	-	5.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-8	6.92	0.70	0.74	0.18	-	9.38	89.1	0.36
8-21	4.11	0.52	1.15	0.18	-	7.55	76.6	0.28
21-71	3.49	0.48	1.12	0.28	-	8.16	62.6	0.18
71-106	2.56	0.48	0.43	0.44	2.04	8.59	40.4	0.15
106-160	2.35	0.52	0.33	0.17	2.31	8.01	39.9	0.16

101. SIKARGAON SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Paleudalfs*.
Type location	:	25°58'38"N latitude, 90°48'0"E longitude; village Sikargaon, district North Cachar hill, Assam.
Profile No.	:	83 G / TNC-42
Physiographic position	:	Gently to moderately sloping hill slopes in North Cachar hill district.
Elevation (m)	:	200-250 m above MSL
Groundwater table	:	>10 m
Rainfall	:	2277 mm
Slope, erosion &relief	:	Gently to moderately sloping, moderately erosion
Drainage & permeability	:	Excessively drained. The saturated hydraulic conductivity is moderately low.
Land use and vegetation	:	Under forest. Bamboo is the predominant plantation.
Geology and parent material	:	Weathered shale
Distribution and extent	:	Extensive in North Cachar district (67,705 ha)
Soil series associated	:	Langting

Typifying pedon: Sikargaon sandy clay loam – forest.

A	0-15 cm	Brown (7.5YR 5/4 M) sandy clay loam; moderate, medium, subangular blocks breaking to granular; friable and slightly sticky; few coarse and many fine roots; slightly acid (pH 6.5); clear smooth boundary.
Bt1	15-50 cm	Yellowish red (5YR 4/6 M) sandy clay loam; moderate, Medium, subangular blocky structure; firm and slightly sticky; thin patchy argillans on ped faces; few coarse and many fine roots; moderately acid (pH 6.0); clear smooth boundary.
Bt2	50-69 cm	Red (2.5YR 4/8 M) clay loam; moderate, medium, subangular blocky structure; firm and slightly sticky; thin patchy argillans on ped faces; few medium and common fine roots; strongly acid (pH 5.5); clear smooth boundary.
Bt3	69-115 cm	Red (2.5YR 4/6 M) clay loam; moderate, fine, subangular blocky structure; firm and slightly sticky; thin patchy argillans on ped faces; few coarse and common fine roots; strongly acid (pH 5.1); diffuse smooth boundary.
Bt4	115-169	Red (2.5YR 5/6 M) clay loam; moderate fine and medium subangular blocky structure; firm and slightly sticky; thin patchy argillans on ped faces; few coarse and few fine roots; strongly acid (pH 5.5).

Range in characteristics : Sikargaon soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in hue 7.5YR, value 4 to 5 chroma 4. The texture is sandy clay loam or sandy loam. Structure is moderate or weak, fine subangular blocks breaking to granular. The B horizon is more than 100 cm thick and has many subhorizons. Its colour is in the hue 2.5YR or 5YR value 4 or 5 and chroma 6 to 8. The texture is clay loam. The structure is moderate, medium or fine

subangular blocks. Thin patchy argillans are observed in the argillic horizons. The soils are slightly acid in the upper 30 to 40 cm and strongly acid below. Fine and coarse roots are distributed throughout the depth.

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	69.8	8.7	21.5	5.6	64.2	-
15-50	56.5	12.0	31.5	4.1	52.4	-
50-69	43.7	19.3	37.0	3.6	40.1	-
69-115	44.7	25.8	29.5	3.6	41.1	-
115-169	45.0	22.0	33.0	4.6	40.4	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.72	-	6.5	-
15-50	0.39	-	6.0	-
50-69	0.45	-	5.5	-
69-115	0.33	-	5.1	-
115-169	0.33	-	5.5	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$Cmol(p^{+})kg^{-1}$							
0-15	4.20	0.42	0.23	0.18	-	5.30	91.5	0.25
15-50	4.00	0.43	0.46	0.09	-	5.92	82.6	0.19
50-69	3.00	0.39	0.56	0.28	1.43	7.75	50.9	0.21
69-115	2.60	0.43	0.23	0.17	1.63	7.34	44.4	0.25
115-169	2.00	0.40	0.16	0.14	0.14	6.94	36.9	0.21

102. BARAK SERIES

Classification	:	Fine, mixed, hyperthermic family of *Aeric Endoaquepts.*
Type location	:	24°53'54"N latitude, 92°52'53"E longitude. Village Udarband, district Cachar, Assam.
Profile No.	:	83 D / G5
Physiographic position	:	Gently sloping flood plains of Barak valley
Elevation (m)	:	20 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	3225 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Poorly drained, improves in post rainy period.The saturated hydraulic conductivity is low.
Land use and vegetation	:	Paddy
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Cachar district (9,662 ha)
Soil series associated	:	Hailakandi, Anipur, Bhanga and Karimganj

Typifying pedon : Barak silty clay loam – cultivated.

Ap	0-10 cm	Dark greyish brown (2.5Y 4/2 M) silty clay loam; moderate medium subangular blocky structure; frible, sticky and plastic; common very many fine roots; strongly acid (pH 5.3); gradual smooth boundary.
Bwg1	10-30 cm	Dark greyish brown (2.5Y 4/2 M) silty clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; few very fine and fine roots; slightly acid (pH 6.2); gradual smooth boundary.
Bwg2	30-62 cm	Olive brown (2.5Y 4/4 M) and dark grey (2.5Y 4/0 M) silty clay loam; few fine distinct black (10YR 2/1) mottles; moderate medium subangular blocky structure; firm sticky and plastic; slightly acid (pH 6.5); gradual smooth boundary.
Cg	62-110 cm	Greyish brown (2.5Y 5/2 M) silty clay; massive structure; firm very sticky and very plastic; neutral (pH 6.6).

Range in characteristics : Barak soils are very deep. The A horizon is 10 to 15 cm thick. Its colour is in the hue 2.5Y or 10YR, value 3 to 5 and chroma 2 or less. The texture is silty clay loam or clay loam. The structure is moderate medium or coarse subangular blocks. The B horizon is 50 to 60 cm thick and has 2 or more subhorizons. Its colour is in the hue 2.5Y or 10YR, value 3 to 4 and, chroma 0 to 4. The lower part of B horizon has low chroma mottles wherever the matrix is of high chroma. The texture is silty clay or silty clay loam. The structure is moderate medium or coarse subangular blocky. The C horizon is generally below 60 to 80 cm. Its colour is in the hue 2.5Y or 10YR, value 4 to 5 and chroma generally less than 2, up to 4 in some locations. These soils are strongly acid on the surface and the acidity gradually decreases to neutral at the depth of 100 cm. The roots are many in the surface horizon and are observed up to the depth of 50 cm.

Competing series : The Bhanga series identified in Karimganj district is competing series. Bhanga series has 36 to 49 percent clay in the upper 50 cm and 41 to 43 percent below 50 cm depth.

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, low fertility
Potato	Moderately suitable	Low pH, low fertility
Wheat, mustard, tomato, beans, pea, cowpea	Marginally suitable	Low pH, low fertility
Cabbage, pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-10	4.4	62.6	33.0	1.6	2.8	-
10-30	4.6	57.9	37.5	1.3	3.3	-
30-62	2.9	61.1	36.0	1.1	1.8	-
62-110	1.1	49.9	49.0	0.6	0.5	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-10	1.08	-	5.3	-
10-30	0.68	-	6.2	-
30-62	0.60	-	6.5	-
62-110	0.58	-	6.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-10	4.0	0.61	0.13	0.39	1.63	8.43	70.1	0.25
10-30	7.4	0.61	0.09	0.23	0.14	10.88	95.6	0.29
30-62	6.2	0.52	0.05	-	-	10.88	100	0.30
62-110	8.18	0.70	0.10	-	-	13.06	100	0.26

103. SILCHAR SERIES

Classification	:	Loamy skeletal mixed, hyperthermic family of *Typic Dystrudepts*.
Type location	:	24°48'0"N latitude, 93°2'0"E longitude; village Champthol Palumpur, district Cachar, Assam.
Profile No.	:	83 H / G 17 / R3
Physiographic position	:	Steep foothills
Elevation (m)	:	100 200 m above MSL
Groundwater table	:	> 10 m
Rainfall	:	3225 mm
Slope, erosion &relief	:	Moderately steeply sloping (15-30% slope), severely eroded
Drainage & permeability	:	Excessively drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Horticultural and plantation crops like pineapple.
Geology and parent material	:	Weathered sandstone
Distribution and extent	:	Extensive in Cachar (12,243 ha), Karbi Anglong (68,220 ha) and North Cachar (47,599 ha) districts
Soil series associated	:	Kalachand

Typifying pedon : Silchar clay loam – cultivated.

Ap	0-15 cm	Dark yellowish brown (10YR 4/4 M) clay loam, moderate fine subangular blocky structure; very friable, sticky and slightly plastic; common medium pores; many very fine and fine roots; 15 per cent gravels of less than 2.5 cm size; strongly acid (pH 5.4); clear smooth boundary.
Bw1	15-50 cm	Yellowish brown (10YR 5/6 M) clay loam; weak medium subangular blocky structure; very friable sticky and slightly plastic; common medium pores; common fine roots; 25 percent gravels of less than 2.5 cm size; strongly acid (pH 5.3); clear smooth boundary.
Bw2	50-96 cm	Yellowish brown (10YR 5/6 M) clay loam; weak medium subangular blocky structure; very friable, sticky and slightly plastic; common medium pores; few fine roots; 40 percent gravels of less than 2.5 cm size; strongly acid (pH 5.4); gradual smooth boundary.
C	96-110 cm	Yellowish brown (10YR 5/6 M) sandy clay loam; massive Structure; very friable, slightly sticky and non plastic; few very fine roots; 40 percent gravels of less than 2.5 cm size; strongly acid (pH 5.4).

Range in characteristics : Silchar soils are very deep. The A horizon is 12 to 20 cm thick. Its colour is in the hue 10 YR, value 4 to 5 and chroma 3 to 4. The texture is silty clay loam or sandy clay loam. The structure is moderate, fine or medium, subangular blocks. The B horizon is 75 to 90 cm thick and has 2 or more subhorizons. Its colour is in the hue 10YR, value 5 to 6 and chroma 4 to 6. The texture is clay loam or sandy clay loam. The structure is weak or moderate, medium or coarse, subangular blocks. The B horizon contains 25 to 40 per cent coarse fragments. The coarse fragments generally are in the lower part of B and C horizons. The C horizon is

generally below 90 to 100 cm. Its colour is in the hue 10YR value 5 to 6 chroma 4 to 6. Its texture is sandy clay loam. It has no structural development. Silchar soils are strongly acid through out the depth of 110 cm. The roots are many in the surface, decreases with depth and few are observed at the depth of 110 cm.

Competing series : No competing series is identified.

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	42.5	25.6	31.9	8.9	33.6	15
15-50	40.8	21.7	37.5	7.2	33.6	25
50-96	43.4	24.1	32.5	6.9	36.5	40
96-110	51.3	23.7	25.0	8.1	43.2	40

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.94	-	5.4	-
15-50	0.99	-	5.3	-
50-96	0.76	-	5.4	-
96-110	0.44	-	5.4	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	3.0	0.56	0.16			10.2	36.47	0.32
15-50	1.4	0.65	0.09			10.4	20.57	0.28
50-96	1.2	0.39	0.08			9.2	18.15	0.28
96-110	1.0	0.43	0.05			8.8	16.82	0.35

104. HAILAKANDI SERIES

Classification	:	Very fine, mixed, hyperthermic family of *Typic Endoaquepts.*
Type location	:	24°48'49" N latitude, 92°36'37" E longitude, Village Badarpur, district Hailakandi, Assam.
Profile No.	:	83 D / G7 / R1
Physiographic position	:	Gently sloping flood plains in the Barak valley
Elevation (m)	:	20 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	3225 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	poorly drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Rice, occasionally fallow..
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Hailakandi district (16,774 ha)
Soil series associated	:	Barak, Anipur, Bhanga and Karimganj

Typifying pedon : Hailakandi clay – cultivated.

Ap	0-15 cm	Grey (2.5Y 5/0 M) clay; many, fine, distinct light olive brown (10YR 5/6) root mottles; moderate medium subangular blocky structure; firm, very sticky and very plastic; many fine pores; common very fine roots; moderately acid (pH 5.6); clear smooth boundary.
Bw	15-32 cm	Brown to dark brown (10YR 4/3 M) clay; strong medium subangular blocky structure; very firm, very sticky and very plastic; many fine pores; moderately acid (pH 5.8); clear smooth boundary.
Bwg1	32-65 cm	Grey (2.5Y 5/0 M) clay; strong medium subangular blocky Structure; many fine pores; slightly acid (pH 6.1); gradual smooth boundary.
Bwg2	65-110 cm	Light grey to grey (2.5Y 6/0 M) clay; strong medium subangular blocky structure; very firm, very sticky and very plastic; many fine pores; few fine iron manganese concretions; slightly acid (pH 6.2).

Range in characteristics : The Hailakandi soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 2.5Y or 10YR, value 4 to 5 and chroma 0 or 1. The texture is clay loam or clay. The structure is moderate medium or coarse subangular blocky. The B horizon is 80 to 100 cm thick and has 2 or more sub horizon. It has colour in the hue 10YR or 2.5Y, value 4 to 6 and chroma generally 0 or 1. The texture is clay. The structure is moderate or strong, medium or coarse, subangular blocks. The C horizon is below a depth of 100 to 120 cm. The surface horizon has many brown root mottles. They are moderately acid up to a depth of 30 cm and slightly acid thereafter. Fe Mn concretions are common below the depth of 50 cm. Roots are many in the surface horizon and decreases with depth.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low organic matter, low fertility
Wheat, mustard, cabbage, tomato, potato, beans, cowpea	Moderately suitable	Low pH, low organic matter, low fertility
Pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	2.5	28.0	69.5	0.9	1.6	-
15-32	3.6	30.9	65.5	1.2	2.4	-
32-65	4.0	34.0	62.0	1.4	2.6	-
65-110	5.6	29.4	65.0	1.5	4.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.20	-	5.6	-
15-32	0.67	-	5.8	-
32-65	0.78	-	6.1	-
65-110	0.38	-	6.2	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	10.0	0.61	0.25		-	20.40	53.2	0.29
15-32	10.6	0.78	0.16		-	19.86	58.1	0.30
32-65	10.6	0.74	0.15		-	19.31	59.5	0.31
65-110	14.0	0.91	0.16		-	20.40	73.9	0.31

105. ANIPUR SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Typic Endoaquepts*.
Type location	:	24°35'36" N latitude, 92°70'22" E longitude, Village Fasal, Tahsil Anipur, district Karimganj, Assam
Profile No.	:	83 D / G26 / R1
Physiographic position	:	Very gently sloping flood plains of Barak valley.
Elevation (m)	:	20 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	3225 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Poorly drained. The saturated hydraulic conductivity is moderately low.
Land use and vegetation	:	Rice, occasionally fallow..
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Hailakandi (11,183 ha) and Karimganj (14,827 ha) districts
Soil series associated	:	Barak, Hailakandi, Bhanga and Karimganj

Typifying pedon : Anipur loam – cultivated.

Ap	0-15 cm	Light brownish grey (10YR 6/2 M) loam; massive structure; friable, sticky and slightly plastic; common medium pores; many very fine roots; strongly acid (pH 5.3); clear smooth boundary.
Bwg1	15-35 cm	Grey (10YR 5/1 M) loam; weak medium subangular blocky Structure; friable, sticky and slightly plastic; common medium pores; moderately acid (pH 5.7); clear smooth boundary.
Bwg2	35-55 cm	Dark grey (10YR 4/1 M) clay loam; weak medium subangular blocky structure; friable, sticky and plastic; common fine pores; slightly acid (pH 6.2); gradual smooth boundary.
Bwg3	55-76 cm	Grey (2.5Y 5/0 M) silt loam; massive structure; friable sticky and slightly plastic; many fine pores; few iron-manganese concretion; slightly acid (pH 6.2); clear smooth boundary.
Cg	76-130 cm	Dark grey (2.5Y 4/0 M) loam; massive structure; friable, sticky and slightly plastic; many fine pores; neutral (pH 6.6).

Range in characteristics : Anipur soils are very deep. The A horizon is 15 to 20 cm thick. Its colour is in the hue 10YR, value 4 to 6 and chroma 2 or less. Its texture is loam or silt loam. The structure is generally massive due to puddling. However, weak medium subangular blocks are observed in some locations. The B horizon is 50 to 70 cm thick and has 2 or more subhorizons. It has colours in the hue 10YR or 2.5Y, value 4 or 5, chroma 1 or 0. The texture is loam or silt loam or even clay loam. The structure is weak or moderate, medium, subangular blocks, however massive structure is also observed in lower parts of B horizon in some locations. The C horizon is generally below a depth of 75 cm. Its colour is in the hue 2.5Y, value 4 or 5 chroma 1 or 0. The texture is loam, clay loam or silt loam. The structure is massive. Fe-Mn concretions are observed

in some locations. The Anipur soils are strongly acid in the surface and the acidity decreases with depth to neutral at 100 cm depth. The roots are many in the surface horizon and decrease with depth, few roots are observed at the depth of 50 cm.

Competing series : No competing series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Moderately suitable	Low pH, low organic matter, coarse texture, low fertility
Potato, beans	Moderately suitable	Low pH, low fertility
Wheat, mustard, cabbage, tomato, cowpea	Marginally suitable	Low pH, low fertility
Pea	Not suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	36.8	45.2	18.0	20.7	16.1	-
15-35	30.7	43.3	26.0	15.7	15.0	-
35-55	25.4	41.1	33.5	10.8	14.6	-
55-76	25.6	55.9	18.5	9.9	15.7	-
76-130	44.0	31.5	24.5	23.4	20.6	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	0.95	-	5.3	-
15-35	0.45	-	5.7	-
35-55	0.26	-	6.2	-
55-76	0.23	-	6.2	-
76-130	0.17	-	6.6	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	cmol(p^{+})kg^{-1}							
0-15	2.20	0.43	0.05		-	4.9	54.7	0.27
15-35	4.60	0.43	0.04		-	8.16	62.1	0.31
35-55	10.40	0.56	0.08		-	12.24	90.2	0.37
55-76	10.60	0.61	0.07		-	12.78	88.3	0.69
76-130	7.00	0.48	0.05		-	8.70	86.6	0.36

106. BHANGA SERIES

Classification	:	Fine, mixed, hyperthermic family of *Aeric Endoaquepts.*
Type location	:	24°54'10"N latitude, 92°30'30"E longitude; village Bhanga, district Karimganj, Assam.
Profile No.	:	83 D / G1/ R1
Physiographic position	:	Very gently sloping flood plains of Barak valley
Elevation (m)	:	20 m above MSL
Groundwater table	:	2-5 m
Rainfall	:	3225 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Poorly drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Rice,
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Karimganj district (9,662 ha)
Soil series associated	:	Hailakandi, Anipur, Barak and Karimganj

Typifying pedon : Bhanga silty clay loam – cultivated.

Ap	0-15 cm	Dark greyish brown (10YR 4/2 M) silty clay loam; massive Structure; friable, sticky and plastic; many very fine pores; common very fine and fine roots; moderately acid (pH 5.6); clear smooth boundary.
Bw1	15-40 cm	Greyish brown (2.5Y 5/2 M) silty clay; weak coarse sub-angular blocky structure; friable, very sticky and very plastic; many very fine pores; few fine roots;slightly acid (pH 6.2); gradual smooth boundary.
Bw2	40-70 cm	Light olive brownish (2.5Y 5/4 M) silty clay; weak coarse subangular blocky structure; friable, very sticky and very plastic; many very fine pores; slightly acid (pH 6.4); gradual smooth boundary.
Bw3	70-110 cm	Greyish brown (2.5Y 5/2 M) silty clay; weak coarse sub-angular blocky structure; firm very sticky and very plastic; many very fine pores; few, very dark grey iron-manganese concretions; slightly acid (pH 6.5); gradual smooth boundary.
Cg	110-160 cm	Grey (2.5Y 5/0 M) clay; massive structure; firm very sticky and very plastic; slightly acid (pH 6.5).

Range in characteristics : Bhanga soils are very deep. The A horizon is 12 to 20 cm thick. Its colour is in the hue 10 YR or 2.5Y, value 4 to 5, chroma 2 or less. The texture is silty clay loam or clay loam. The structure is generally massive due to frequent puddling. The B horizon is 80 to 100 cm thick and has 2 or more sub horizons. It has colours in the hue 2.5Y, value 5 or 6 chroma generally less than 2 and up to 4 in some subhorizons. The texture is silty clay. The structure is moderate or weak, medium or coarse, subangular blocks. The C horizon is generally below the depth of 100 cm. Its colour is in the hue 2.5Y, value 5 or 6, chroma generally 0. Its texture is clay with clay percentage exceeding 50. The structure is massive. These soils are moderately acid in the surface and the acidity decreases wih depth to slightly acid. Iron-manganese concretions are

observed in B horizon in some locations. Roots are many in the surface, decreases with depth and few are observed up to the depth of 40 cm.

Competing series : The Barak series identified in Silchar district is competing series. Barak soils have 33 to 37 percent clay in upper 50 cm and 36 to 49 percent clay below 50 cm depth.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Wheat, mustard, cabbage, tomato, potato, beans, cowpea	Moderately suitable	Low pH, low fertility
Pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-15	2.0	61.5	36.5	0.9	1.1	-
15-40	2.2	48.8	49.0	0.7	1.5	-
40-70	4.2	54.8	41.0	1.5	2.7	-
70-110	4.5	52.0	43.5	1.2	3.3	-
110-160	3.1	34.9	62.0	1.0	2.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-15	1.38	-	5.6	-
15-40	0.78	-	6.2	-
40-70	0.56	-	6.4	-
70-110	0.44	-	6.5	-
110-160	0.44	-	6.5	-

Depth (cm)	Extractable bases			Extrac-table acidity	Extrac-table Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}					
	$cmol(p^{+})kg^{-1}$							
0-15	4.6	0.39	0.14			10.2	50.3	0.28
15-40	8.4	0.42	0.09			14.0	63.6	0.29
40-70	10.2	0.56	0.09			14.2	76.4	0.35
70-110	12.6	0.65	0.11			15.6	85.6	0.36
110-160								

107. KARIMGANJ SERIES

Classification	:	Fine loamy, mixed, hyperthermic family of *Fluvaquentic Endoaquepts*.
Type location	:	24°52'53" N latitude, 92°17'18" E longitude, Village Karimganj, district Karimganj, Assam.
Profile No.	:	83 D / G5 A/ R1
Physiographic position	:	Very gently sloping flood plains of Barak valley
Elevation (m)	:	20 m above MSL
Groundwater table	:	1-2 m
Rainfall	:	3225 mm
Slope, erosion &relief	:	Very gently sloping (1-3% slope), slightly eroded
Drainage & permeability	:	Poorly drained. The saturated hydraulic conductivity is low.
Land use and vegetation	:	Rice,
Geology and parent material	:	Alluvium
Distribution and extent	:	Extensive in Karimganj district (9,884 ha)
Soil series associated	:	Hailakandi, Anipur, Bhanga and Barak

Typifying pedon : Karimganj silty clay - cultivated.

Ap	0-13 cm	Dark grey (2.5Y 4/0 M) silty clay; massive structure; firm, very sticky and very plastic; many fine pores; few very fine roots; moderately acid (pH 5.6); clear smooth boundary.
Bw1	13-24 cm	Olive brown (2.5Y 4/4 M) silty clay; moderate medium subangular blocky structure; firm very sticky and very plastic; many fine pores; few fine roots; neutral (pH 7.); clear smooth boundary.
Bw2	24-75 cm	Light olive brown (2.5Y 5/6 M) silty clay loam; moderate coarse subangular blocky structure; firm sticky and plastic; many fine pores; neutral (pH 7.0); clear smooth boundary.
BC	75-90 cm	Greyish brown (2.5Y 5/2 M) silty clay loam; massive structure; firm sticky and plastic; many fine pores slightly alkaline (pH 7.5); clear smooth boundary.
C1	90-130 cm	Dark greyish brown (2.5Y 4/2 M) silt loam; massive structure; firm sticky and plastic; many fine pores; slightly alkaline (pH 7.4); clear smooth boundary.
C2	130-150 cm	Light olive brown (2.5Y 5/4 M) clay loam; massive structure; firm sticky and plastic; many fine pores; slightly alkaline (pH 7.4).

Range in characteristics : Karimganj soils are very deep. The A horizon is 12 to 20 cm thick. Its colour is in the hue 2.5Y or 10YR, value 3 or 4, chroma 0 or 1. The texture is silty clay or silty clay loam. The structure is massive due to frequent puddling. However, some location weak development of structure is observed. The B horizon is 50 to 75 cm thick and has 2 or more subhorizons. Its colour is in the hue 2.5Y, value 4 or 5, chroma 2 to 6. The texture is silty clay loam or silt loam. The structure is moderate medium or coarse subangular blocks. The C horizon

is generally below 90 cm. It has colours in the hue 2.5Y value 4 to 6, chroma 2 to 4. The texture is silt loam or silty clay loam or clay loam. The structure is massive. The soil reaction is moderately acid in the surface horizon and neutral or slightly alkaline in the other horizons. The roots are many in the surface and rooting depth is confined to upper 25 cm.

Competing series : No competing soil series is identified.

Interpretation :

Suitability to crops

Crop	Suitability class	Limitations
Rice	Suitable	No limitation
Wheat, mustard, tomato, potato, beans, cowpea	Moderately suitable	Low pH, low fertility
Pea	Marginally suitable	Low pH, low fertility

SOIL ANALYSIS

Depth (cm)	Particle size distribution (particle size in mm, soil separates in %)					Coarse fragments (>2mm) (%)
	Total			Sand		
	Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Very fine (0.1-0.05)	Others (2.0-0.1)	
0-13	3.0	52.5	44.5	1.5	1.5	-
13-24	8.6	48.9	42.5	4.8	3.8	-
24-75	12.9	52.1	35.0	7.9	5.0	-
75-90	12.3	53.7	34.0	7.7	4.6	-
90-130	6.1	68.4	25.5	3.3	2.8	-
130-150	32.6	33.9	33.5	22.5	10.1	-

Depth (cm)	O.C. (%)	$CaCO_3$ (%)	pH (1:2.5 H_2O)	E.C. (1:2.5 H_2O)(dSm^{-1})
0-13	1.62	-	5.6	-
13-24	0.67	-	7.0	-
24-75	0.44	-	7.0	-
75-90	0.34	-	7.5	-
90-130	0.42	-	7.4	-
130-150	0.29	-	7.4	-

Depth (cm)	Extractable bases			Extractable acidity	Extractable Al^{3+}	CEC	Base saturation (%)	CEC/ Clay
	$Ca^{2+}+Mg^{2+}$	Na^{+}	K^{+}	$cmol(p^{+})kg^{-1}$				
0-13	5.2	0.30	0.15		-	13.2	42.8	0.29
13-24	11.6	0.39	0.10		-	13.8	87.6	0.32
24-75	8.2	0.38	0.08		-	9.4	92.1	0.27
75-90					-			
90-130					-			
130-150								

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Distribution of soil series and their extent

Sr. No.	Soil Series	Distribution and extent	Soil series associated	Page No.
1.	Baungaon	Extensive in Lakhimpur district (15,650 ha)	Jiyadhol	6
2.	Jiyadhol	Extensive in Lakhimpur (1,915 ha) and Dhemaji (11,837 ha) districts	Baungaon	8
3.	Balipara	Extensive in Sonitpur (14,274 ha) and Darrang (52,390 ha) districts	Sonitpur	10
4.	Bharali	Extensive in Sonitpur (28,514 ha), Nalbari (57,206 ha)and Barpeta (45,234 ha) districts	Tezpur	12
5.	Sonitpur	Extensive in Sonitpur district (9,527 ha)	Balipara	14
6.	Tezpur	Extensive in Tezpur district (36,334 ha)	Bharali	16
7.	Darrang	Extensive in Darrang district (20,706 ha)	Dhansiri	18
8.	Dhansiri	Extensive in Darrang district (18,781 ha)	Darrang	20
9.	Maroa	Extensive in Sonitpur (17,852 ha) and Nalbari (20,197 ha) districts	Nalbari and Tihu	22
10.	Nalbari	Extensive in Nalbari districts (26,595 ha)	Maroa and Tihu	24
11.	Tihu	Extensive in Nalbari district (2,066 ha)	Nalbari and Maroa	26
12.	Barpeta	Extensive in Barpeta (15,496 ha) and Bongaigaon (27,892 ha) districts	Goraimara and Howli	28
13.	Goraimara	Extensive in Sonitpur (62,160 ha) Darrang (24,715 ha) and Barpeta (20,888 ha) districts	Barpeta and Howli	30
14.	Howli	Extensive in Barpeta districts (6,641 ha)	Barpeta and Goraimara	32
15.	Abhayapuri	Extensive in Bongaigaon district (7,247 ha)	Salmara	34
16.	Bongaigaon	Extensive in Bongaigaon district (26,425 ha)	Jagighopa	36
17.	Jogighopa	Extensive in Bongaigaon district (8,617 ha)	Bongaigaon	38
18.	Dhubri	Extensive in Dhubri district (19,861 ha)	Golakganj	40
19.	Golakganj	Extensive in Dhubri district (13,363 ha)	Dhubri	42
20.	Salmara	Extensive in Dhubri district (9,006 ha)	Abhyapuri	44
21.	Tinsukia	Extensive in Tinsukia (70,762 ha) and Dibrugarh (75,483 ha) districts	Dibrugarh	46
22.	Dibrugarh	Extensive in Dibrugarh district (22,775 ha)	Tinsukia	48
23.	Dihing	Extensive in Dibrugarh district (24,193 ha)	Khowang	50
24.	Khowang	Extensive in Dibrugarh district (2,711 ha)	Dihing	52
25.	Disang	Extensive in Sibsangar (3,746 ha) and Hailakandi (17,213 ha) districts	Sibsagar	54
26.	Domgaon	Extensive in Sibsagar district (24,144 ha)	Amguri	56
27.	Kalugaon	Extensive in Sibsagar district (8,436 ha)	Moran	58
28.	Moran	Extensive in Sibsagar district (1,760 ha)	Nazira	60
29.	Naharbari	Extensive in Sibsagar district (29,680 ha)	Sonari	62
30.	Sibsagar	Extensive in Sibsagar district (9,363 ha)	Disang	64
31.	Sonari	Extensive in Sibsagar district (18,807 ha)	Naharhabi	66
32.	Adhakota	Extensive in Jorhat district (1,487 ha)	Matikhola	68
33.	Bangaon	Extensive in Jorhat district (5,881 ha)	Kamalabari and Lahangaon	70
34.	Barhalla	Extensive in Jorhat district (11,942 ha)	Titabar	72
35.	Bhogdai	Extensive in Jorhat district (14,169 ha)	Kakailamukh, Jorhat, dohotia, Adhakota and Majuli	74
36.	Disai	Extensive in Jorhat district (4,296 ha)	Tiru	76
37.	Dhotia	Extensive in Jorhat district (7,314 ha)	Kakadanga	78
38.	Jorhat	Extensive in Jorhat district 13,326 ha)	Kakoilamukh, Bhogdoi, Dohotia, Titabar	80

Sr. No.	Soil Series	Distribution and extent	Soil series associated	Page No.
39.	Kakadanga	Extensive in Jorhat district (11,323 ha)	Kakilamukh, Adhakota, Dohotia	82
40.	Kamalabari	Extensive in Dibrugarh (32,587 ha) Jorhat (21, 551 ha) Dhemaji (43,161 ha) and Lakhimpur (22,970 ha) districts	Bangaon, Lahangaon, Majuli	84
41.	Kakilamukh	Extensive in Jorhat district (13,703 ha)	Majuli, Kakadanga, Jorhat, Bhogdai	86
42.	Lahangaon	Extensive in Tinsukia (24,084 ha), Jorhat (7,701 ha), Dhemaji (21,521 ha) and Lakhimpur (10,895 ha) districts	Bangaon, Kamalabari	88
43.	Majuli	Extensive in Jorhat district (10,695 ha)	Kamalabari, Kakilamukh, Bhogdai	90
44.	Mariani	Extensive in Jorhat district (12,273 ha)	Teok	92
45.	Matikhola	Extensive in Jorhat district (2,762 ha)	Bhogdai	94
46.	Nagini	Extensive in Sibsagar (45,649 ha) and Jorhat (6,114 ha) districts	Tiru, Sildubi, Mariani	96
47.	Rowriah	Extensive in Jorhat district (8,327 ha)	Titabar	98
48.	Sangsoa	Extensive in Jorhat district (12,196 ha)	Teok	100
49.	Sildubi	Extensive in Jorhat district (1,000 ha)	Nagini	102
50.	Teok	Extensive in Tinsukia (45,331 ha) Sibsagar (44,521 ha), Jorhat (16,324 ha) and Gologhat (31,543 ha) districts	Mariani, Sangsoa	104
51.	Tiru	Extensive in Jorhat district (11,025 ha)	Disai, Nagini	106
52.	Titabar	Extensive in Jorhat (16,064 ha) and Golaghat (21,029 ha) districts	Rowriah, Jorhat, Barhalla, Dohotia	108
53.	Furkating	Extensive in Gologhat district (9,336 ha)	Golaghat	110
54.	Golaghat	Extensive in Golaghat district (20,746 ha)	Furkating	112
55.	Kaziranga	Extensive in Golaghat district (7,205 ha)	Rangajan	114
56.	Rangajan	Extensive in Golaghat district (31,119 ha)	Kaziranga	116
57.	Dihing	Extensive in Nagaon district (13,456 ha)	Nagaon, Rupahi	118
58.	Kathiatali	Extensive in Nagaon district (23,636 ha)	Laokhowa	120
59.	Laokhowa	Extensive in Nagaon district (6,204 ha)	Kathiatali	122
60.	Nagaon	Extensive in Nagaon district (1,157 ha)	Dhing, Rupahi	124
61.	Rupahi	Extensive in Nagaon district (17,524 ha)	Dhing, Nagaon	126
62.	Amkata	Extensive in Morigaon district (4,610 ha)	Dhumria	128
63.	Barbhagia	Extensive in Morigaon district (20,708 ha)	Morigaon, Haldibari, Mayang, Katani.	130
64.	Dharamtul	Extensive in Morigaon district (2,184 ha)	Mayang	132
65.	Dighalbari	Extensive in Nagaon (53,148 ha) and Morigaon (16,726 ha) districts	Morigaon, Katani, Haldibari, Barbhagia	134
66.	Dumria	Extensive in Morigaon district (1,138 ha)	Amkata	136
67.	Haldibari	Extensive in Morigaon district (12,428 ha)	Morigaon, Barbhagia, Katani, Dighalbari	138
68.	Kapili	Extensive in Morigaon district (9,598 ha)	Matikhola	140
69.	Katani	Extensive in Morigaon district (14,050 ha)	Dighalbari, Haldibari, Barbhagia	142
70.	Kumarduchi	Extensive in Morigaon district (3,276 ha)	Bhaluka	144
71.	Mayang	Extensive in Morigaon district (4,962 ha)	Dharamtul, Kumarkuchi, Barbhagia	146
72.	Mikirbheta	Extensive in Morigaon district (1,573 ha)	Morigaon	148
73.	Morigaon	Extensive in Morigaon district (20,115 ha)	Barbhagia, Haldibari, Dighalbari, Mikirbheta	150

Sr. No.	Soil Series	Distribution and extent	Soil series associated	Page No.
74.	Polaguri	Extensive in Morigaon district (2,046 ha)	Beltala	152
75.	Ambari	Extensive in Kamrup district (29,080 ha)	Singra, Habilagaon	154
76.	Bharatpur	Extensive in Kamrup district (6,512 ha)	Rangingpara	156
77.	Habilagaon	Extensive in Kamrup district (11,498 ha)	Ambari	158
78.	Kamrup	Extensive in Kamrup (13,654 ha) and Dhubri (44,822 ha) districts	Singra	160
79.	Khaiapara	Extensive in Kamrup district (5,608 ha)	Habilagaon	162
80.	Malita	Extensive in Kamrup district (10,528 ha)	Nilachal	164
81.	Moindra	Extensive in Kamrup district (14,021 ha)	Nichalamari	166
82.	Nichalamari	4,399 ha) Cachar (63,089 ha) and Karimganj (35,546	Moindra	168
83.	Nilachal	Extensive in Kamrup district (9,318 ha)	Malita	170
84.	Rangingpara	Extensive in Kamrup district (22,492ha)	Bharatpur and Luki	172
85.	Singra	Extensive in Kamrup district (18,187 ha)	Ambari and Bharatpur	174
86.	Dudharai	Extensive in Goalpara district (11,480 ha)	Krishnai	176
87.	Goalpara	Extensive in Goalpara district (7,223 ha)	Jinjiram and Lakhipur	178
88.	Garopara	Extensive in Goalpara district (7,666 ha)	Ranjuli	180
89.	Jinjiram	Extensive in Goalpara district (17,866 ha)	Goalpara and Lakhipur	182
90.	Krishnai	Extensive in Goalpara district (24,077 ha)	Dudhnai	184
91.	Lakhipur	Extensive in Goalpara (16,051 ha), Cachar (14,942 ha) and Karimganj (29,768 ha) districts	Goalpara and Jinjiram	186
92.	Ranjuli	Extensive in Goalpara district (1,024 ha)	Garopara	188
93.	Hemaitarangaon	Extensive in Karbi Anglong district (13,680 ha)	Japrijan	190
94.	Japrijan	Extensive in Karbi Anglong district (1,600 ha)	Hemaitarangaon	192
95.	Nambar	Extensive in Karbi Anglong district (1,911 ha)	Silonijan	194
96.	Silonijan	Extensive in Karbi anglong district (18,012 ha)	Nambar	196
97.	Kalachand	Extensive in North Cachar district (35,355 ha)	Moibang and Mupa	198
98.	Langting	Extensive in North Cachar district (13,627 ha)	Sikargaon	200
99.	Moibang	Extensive in North Cachar district (25,741 ha)	Kalachand and Mupa	202
100.	Mupa	Extensive in North Cachar district (31,447 ha)	Kalachand and Moibang	204
101.	Sikargaon	Extensive in North Cachar district (67,705 ha)	Langting	206
102.	Barak	Extensive in Cachar district (9,662 ha)	Hailakandi, Anipur, Bhanga and Karimganj	208
103.	Silchar	Extensive in Cachar (12,243 ha), Karbi Anglong (68,220 ha) and North Cachar (47,599 ha) districts	Kalachond	210
104.	Hailakandi	Extensive in Hailakandi district (16,744 ha)	Barak, Anipur, Bhanga and Karimganj	212
105.	Anipur	Extensive in Hailakandi (11,183 ha) and Karimganj (14,827 ha) districts	Barak, Hailakandi, Bhanga and Karimganj	214
106.	Bhanga	Extensive in Karimganj district (9,662 ha)	Hailakandi, Anipur, Barak and Karimganj	216
107.	Karimganj	Extensive in Karimganj district (9,884 ha)	Hailakandi, Anipur, Bhanga and Barak	218

Districtwise occurrence of Soil Series Soil Correlation

Sr. No.	District	Soil Series	Correlated soil series with report no.	Page No.
1)	Lakhimpur	Baungaon (15,650 ha), Jiyadhol (1,91,540 ha), Kamalabari (22,970 ha), Lahangaon (10,895 ha)		6 8 84 88
2)	Dhemaji	Jiyadhol (11,837 ha) Kamalabari (43,161 ha) Lahangaon (21,521 ha)		8 84 88
3)	Sonitpur	Balipara (14,274 ha), Bharali (28,514 ha), Sonitpur (9,527 ha), Maroa (17,852 ha), Goraimara (62,160 ha)		10 12 14 22 30
4)	Darrang	Balipara (52,390 ha), Darrang (20,706 ha), Dhansiri (18,781 ha), Goraimara (24,715 ha)		10 18 20 30
5)	Nalbari	Bharali (57,206 ha), Maroa (20,197 ha) Nalbari (26,595 ha), Tihu (2,066 ha)		12 22 24 26
6)	Tezpur	Tezpur (36,334 ha)		16
7)	Barpeta	Barpeta (15,496 ha), Goraimara (20,888 ha) Howli (6,641 ha)		28 30 32
8)	Bongaigaon	Barpeta (27,892 ha), Abhayapuri (7,247 ha), Bongaigaon (26,425 ha), Jogighupa (8,617 ha)		28 34 36 38
9)	Dhubri	Dhubri (19,861 ha), Golakganj (13,363 ha), Salmara (9,006 ha), Kamrup (44,822 ha)		40 42 44 160
10)	Tinsukia	Tinsukia (70,762 ha), Lahangaon (24,084 ha), Teok (45,331 ha)		46 88 104
11)	Dibrugarh	Tinsukia (75,483 ha), Dibrugarh (22,775 ha), Dihing (24,193 ha), Khowang (2,711 ha) Kamalabari (32,587 ha)		46 48 50 52 84
12)	Sibsagar	Disang (3,746 ha), Kalugaon (8,436 ha), Moran (1,760 ha), Naharbari (29,680 ha), Sibsagar (9,363 ha), Sonari (18,807 ha), Nagini (45,649 ha), Teok (44,521 ha)	 Kalugaon (529) Naharbari (529)	54 58 60 62 64 66 96 104
13)	Jorhat	Adhakota (1,487 ha), Bangaon (5,881 ha), Barhalla (11,942 ha),	Adhakota (526)	68 70 72

		Bhogdai (14,169 ha),		74
		Disai (4,296 ha),	Disai (526)	76
		Dhotia (7,314 ha),	Dhotia (526)	78
		Jorhat (13,326 ha),		80
		Kakadanga (11,323 ha),		82
		Kamalabari (21,551 ha),		84
		Kakilamukh (13,703 ha),		86
		Lahangaon (7,701 ha),	Lahangaon(526)	88
		Majuli (10,695 ha),		90
		Mariani (12,273 ha),		92
		Matikhola (2,762 ha),	Matikhola (526)	94
		Nagini (6,114 ha),		96
		Rowriah (8,327 ha),		98
		Sangsoa (12,196 ha),	Sangsoa (526)	100
		Sildubi (1,000 ha),	Sildubi (526)	102
		Teok (16,324 ha),		104
		Tiru (11,025 ha),		106
		Titabar (16,064 ha)		108
14)	Golaghat	Titabar (21,029 ha),		108
		Furkating (9,336 ha),		110
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23)	Hailakandi	Hailakandi (16,744 ha), Anipur (11,183 ha)		212 214

RESEARCH PROJECT TEAM

Preparation of Soil Resource Map of Assam

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