

MAY 22, 2023

**GREEN AUDIT REPORT
NORTH LAKHIMPUR COLLEGE, LAKHIMPUR**



SUBMITTED TO
THE PRINCIPAL
NORTH LAKHIMPUR COLLEGE
P.O.: KHELMATI, LAKHIMPUR, ASSAM 787031

SUBMITTED BY
TRCATS LLP
REGISTERED OFFICE: BARUAH CHUBURI, MAZGAON,
SONITPUR, ASSAM, 784001

Acknowledgement

We are sincerely thankful to the Management of North Lakhimpur College for giving us the opportunity to conduct Green Audit of the Institute.

We are also grateful to Dr. Biman Chandra Chetia, Principal, North Lakhimpur College, Assam whose valuable comments / feedback, during various reviews have helped us during the course of the Audit.

We express our sincere gratitude to all other concerned officials for their support and guidance during the conduct of this exercise.

For TRCATS LLP



**(Dr. Dipal Baruah)
Director (R&D and Innovation)
TRCATS LLP**



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Study Team

1. Dr. Dipal Baruah, PhD, M. Tech (Energy Technology), B.E (Mechanical Engineering)
TRCATS LLP, Baruah Chuburi, Mazgaon, Sonitpur, Assam, 784001
2. Dr. Sampriti Kataki, PhD (Energy), M.Sc (Environmental Science)
TRCATS LLP, Baruah Chuburi, Mazgaon, Sonitpur, Assam, 784001



Dr. Dipal Baruah
Director (R&D and Innovation)
TRCATS LLP



Dr. Sampriti Kataki
Environmental Specialist
TRCATS LLP





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GSTIN: 18AAUFT1027A1ZB



www.trcats.co.in



trcatsllp@gmail.com



+91-9435383057



Baruah Chuburi, Mazgaon, Tezpur,
Sonitpur, Assam - 784001, India

Ref. No. Cert./2023/001

Date: 22/05/2023

TO WHOM IT MAY CONCERN

This is to certify that TRCATS LLP having registered office at Baruah Chuburi, Mazgaon, Tezpur, Sonitpur, Assam -784001 has successfully conducted the Green Audit of NORTH LAKHIMPUR COLLEGE, P.O.: KHELMATI, LAKHIMPUR, ASSAM 787031.

The college has provided necessary data and credential for scrutiny. The activities and measures undertaken by the college has been verified. After collecting and analyzing the required data, the Green Audit report has been prepared and submitted. The efforts taken by the college towards environmental sustainability is highly appreciated and commendable.

(Dr. Dipal Baruah)
Director (R&D and Innovation)
TRCATS LLP



1. INTRODUCTION

Energy is required for the maintenance and sustenance of quality. Fossil fuel is a major source of this energy. The primary causes of climate change are the use of fossil fuels and deforestation. All societal stakeholders must implement green measures to reduce these problems, and higher education institutions play a more significant role in this.

North Lakhimpur College takes steps to contribute towards the reduction in Green House Gas (GHG) from the atmosphere in order to support UN's Sustainable Development Goals. The "Green Audit" of the college campus, which is a component of this effort, is crucial for the institution's self-evaluation and displays the college's commitment for environmental sustainability.

The authorities of North Lakimpur College have undertaken some eco-friendly efforts towards environmental sustainability, which have been identified and evaluated in this Green Audit. A Green Audit is a useful tool for creating a sustainable culture because it implements sustainability via the systematic identification, measurement, documentation, reporting, and monitoring of key environmental parameters. Evaluation of the campus's floral and faunal diversity is another aspect of the Green Audit.

2. OBJECTIVE

The idea of the green audit is to identify, quantify, describe and prioritize framework of Environmental Sustainability in the college campus. The main objectives of the Green Audit are assessment of the following in the college campus:

- Land use analysis.
- Floral diversity.
- Faunal diversity.
- Weather data.
- Water analysis.
- Noise level.
- Waste disposal practices.
- Transportation practice.

- Electrical power consumption
- Green practices and activities.

3. BENEFITS OF GREEN AUDIT

A green audit has multi-faceted benefits in terms of reinforcing the contribution of an institute towards environmental sustainability. Some key points are summarized below.

- Improved environmental practices of the institute.
- More efficient resource management.
- Benchmarking for environmental conservation initiatives.
- Augmenting the creation of a green campus.
- Improved waste management through reduction of waste generation and recycling.
- Enhancing the awareness for environmental conservation guidelines and duties.
- Cost saving methods through better resource management.
- Developing environmental ethics and value systems among the students and other stakeholders.
- Develop a valuable tool to monitor the environmental and sustainable development practices of the college.
- Improvement of overall college profile.

4. METHODOLOGY ADOPTED FOR GREEN AUDIT

The methodology adopted to perform the entire Green Audit exercise includes: collection of data, physical inspection of the campus, observation and review of the documentation, data analysis and reporting. The steps of the Audit are detailed below.

Step 1 – Data Collection

Data collection was performed by using different tools such as observation, measurements and communicating with responsible/representative persons of the college.

Following steps were taken for data collection:

- The audit team visited each building and department, library, canteen, open space, gardens of the campus and information were collected by interviewing with the representative person.
- Land use data of the college were collected.
- The energy data such as monthly electricity consumption and fuel consumption were collected from the officials and analyzed.
- Waste management facilities such as dustbins, vermicompost unit etc. were observed closely. Other waste disposal processes adopted by the college were reviewed.
- All flora and fauna found in the college campus were identified and listed out.
- Water quality and noise level of the campus were evaluated.

Step 2 - Campus tour and physical inspection

The audit team visited the campus on 28th April, 2023 to collect and review necessary data.

Step 3 - Document review and verification

During the visit, available facility documentation was reviewed with facility representatives. This documentation review includes data related to-

- Land use pattern
- Geographical location
- Flora and faunal diversity
- Water analysis
- Waste management
- Transportation practice
- Energy consumption and conservation measures taken by the College
- Green practices and activities
- Expenditure on green initiatives

Step 4 – Key parameter measurement and testing

- Water analysis of the College
- Noise level of the College campus

Step 5 - Data Analysis

- Analysis of land use land cover data
- Weather data analysis (Average ambient temperature and humidity analysis)
- Analysis of data related to energy consumption (Electricity and fuel consumption)
- Water test report analysis
- Analysis of noise level at different locations of the campus.

Step 6 - Report preparation and recommendation

The results of our findings are summarized in this report. The report includes a description of the college campus including different facilities available. The energy and environmental conservation initiatives already taken by the college authority have been mentioned in the report.

The report incorporates a summary of all the activities and effort performed in past few years to conserve environment and energy within the campus or outside. The report also includes the activities performed by the college authorities along with the local communities for awareness generation and community participation towards better environmental practices to address the present environmental challenges.

5. DESCRIPTION OF THE COLLEGE CAMPUS

North Lakhimpur College was established in 1952. The campus is located in Khelmati area of Lakhimpur District of Assam. The geographical location of the college is 27.2308° N, 94.0898° E (Fig. 1).

The lifeline of the Lakhimpur district is the Subansiri river, the biggest tributary of the Brahmaputra River. It flows south to the Assam Valley and joins the Brahmaputra in the Lakhimpur district. The climate around the college area is subtropical, with pleasantly warm, dry winters from November to February and a long, hot and rainy period from April to mid-October. The monsoon runs roughly from June to early or mid-October, but

from March to May (and more rarely in February) showers occur, which gradually become more intense and frequent.



Fig. 1 Google Earth Map of North Lakhimpur College

The built-up area and the plantation area of the college are 15043.75 m² and 1065.23 m², respectively. The college campus area consists of multiple buildings, both single story Assam type and multi-story RCC buildings along with the green vegetation area and trees. The campus is surrounded by road on the southern and western side, residential area on both northern and western side.

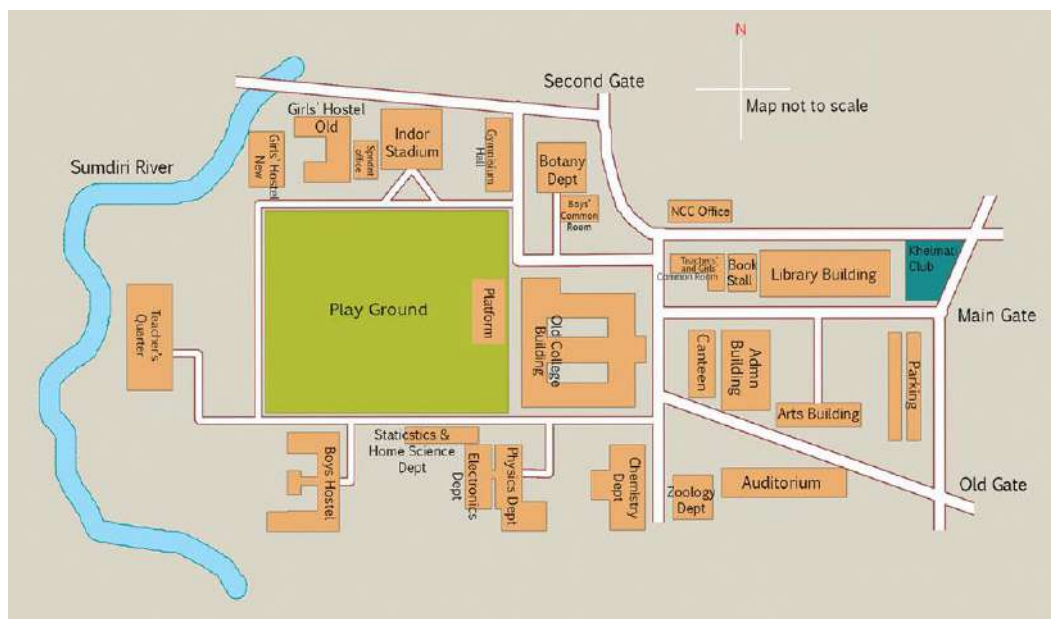


Fig. 2 Layout of North Lakhimpur College

At present the College has 12 Departments distributed in different buildings which includes classrooms, laboratories, library, auditorium, office, store and bathrooms. The college also has canteen, playground, hostels and open green space with vegetation and trees. The layout of the campus is shown in Fig. 2.

6. LAND USE ANALYSIS

The geographical location of the campus is at latitude 27.2308° N and longitude 94.0898° E. Total land cover data of the college campus has been collected from the college authority and from Google Earth. 21.9% of the land has been used for different construction (Building) purposes, out of which 10% is RCC buildings and remaining 11.9% is Assam Type buildings. Approximately 27.1% of the land area is being used as playground of which majority is covered with natural grasses along with a synthetic track used for athletic activities. Remaining 32% of land has been planted with varieties of timber, fruit yielding plants, ornamental and medicinal plants and 5% is covered with gardens. The campus has a water body which covers nearly 4% of the total area, an open meeting area occupying 4% and roads occupying 6% of the total area. Fig. 3 shows the land use pattern of the college. The total built-up area of the campus is occupied by number of buildings and are listed in Table 1.

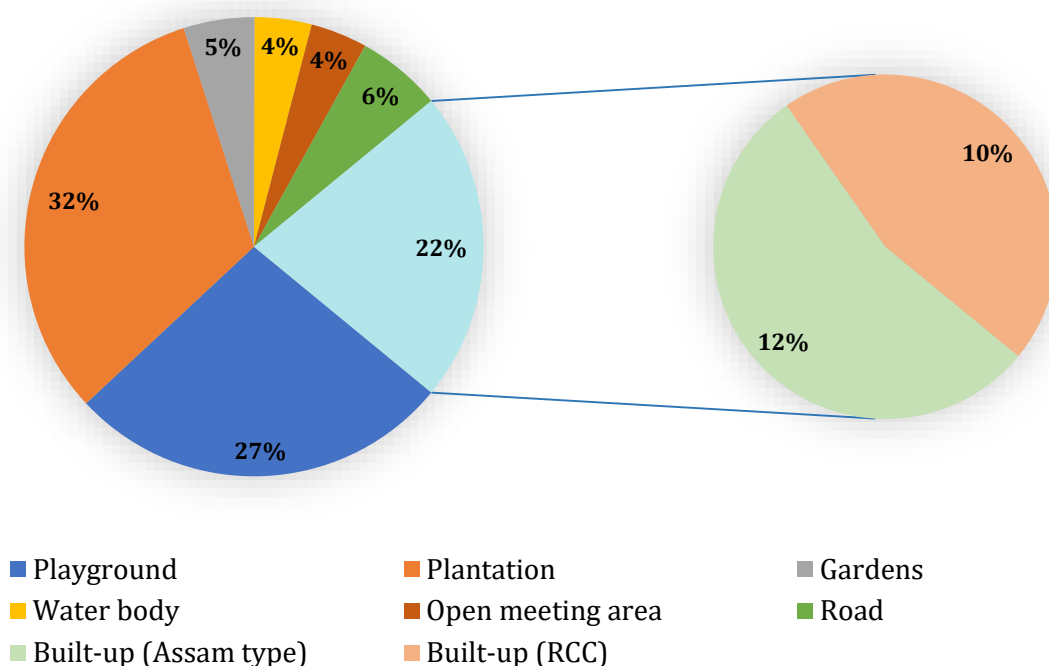


Fig. 3 Land Use pattern of North Lakhimpur College

Table 1 Building details

Sl. No.	Building/Block	Number of Floor
1	Nasim Ali Hazarika Building (Assam Type)	1
2	Department of Physical Education (RCC)	2
3	Department of Home Science (Assam Type)	1
4	Department of Physics (RCC)	2
5	Department of Electronics (Assam Type)	1
6	Zoology Building (RCC)	2
7	Chemistry Building (RCC)	1
8	Labanya Charan Deka Building (RCC)	3
9	Seminar Halls (RCC)	2
10	Library Building (RCC)	3
11	Botany Department (Assam Type)	1
12	Botany Department (RCC)	2
13	Canteen (Assam Type)	1
14	New Boys' Hostel (Assam Type)	1
15	PG Boys' Hostel (RCC)	2
16	Mamoni Roysom Girls' Hostel (Assam Type + RCC)	AT=1; RCC=2
17	Indira Miri Girls' Hostel	2

7. WEATHER DATA OF THE COLLEGE CAMPUS

The ambient air temperature and relative humidity data were obtained from the NASA website (<https://power.larc.nasa.gov/data-access-viewer/>)

The NASA data are satellite-retrieved; its parameters are computed on a daily average basis using NASA/GEWEX surface radiation Budget model. The model considers the effect of cloud cover and local atmospheric conditions. Compared to BSRN (Baseline Surface Radiation Network) sites the NASA data show high accuracy with Bias (less than 0.12)

and RMSE (Root Mean Square Error) (less than 18%). BSRN sites are the most accurate approved ground sites.

Table 2 shows the monthly average air temperature and relative humidity of North Lakhimpur college campus for the year of 2021 (January to December). It has been observed that the average air temperature of the campus is ranging between 10.38 °C to 36.49 °C, whereas the average relative humidity of the campus varies from to 61.5 % to 85.25%.

Table 2 Variation of monthly temperature and relative humidity in the North Lakhimpur College campus

Months	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Max. Air Temp (°C)	24.61	27.58	32.38	36.49	36.04	33.41	34.96	35.56	35.04	34.45	27.83	25.98
Min. Air Temp (°C)	10.9	11.83	15.25	18.78	21.06	23.4	24.24	23.15	24.12	18.98	13.8	10.38
Avg RH (%)	78.62	69.62	64.44	61.5	72.06	82.5	83.38	85.25	80.62	80.25	78.81	74.88

8. WATER QUALITY OF THE COLLEGE CAMPUS

Water quality testing is an important aspect as it identifies contaminants and thus helps to avoid spread of water borne diseases. North Lakhimpur College uses ground water for their daily needs. Water is being used in the campus as drinking water, used in bathrooms both in canteen and academic buildings and for gardening and other purposes. Therefore, it is very important to test the water to ensure the quality to use for all purposes.

The indicators tested for water quality include alkalinity; color of water; pH Value; Taste and odor; dissolved metals and salts; presence of microorganisms such as fecal coliform bacteria (*Escherichia coli*), *Cryptosporidium*, and *Giardia lamblia*; dissolved metals and metalloids (lead, mercury, arsenic, etc.); colored dissolved organic matter (CDOM); dissolved organic carbon (DOC), heavy metals.

Water quality test was carried out by the District Level Laboratory (NABL accredited), Public Health Engineering, North Lakhimpur, for the Canteen, Chemistry department and Hostels. The reports of the same are shown in Fig. 4 – Fig. 7.



District Level Laboratory, North Lakhimpur
 Address: Office of the Executive Engineer (PHE), North Lakhimpur
 Japisajaya, North Lakhimpur 787031
 E-mail.ID:-laboratorynlp555@gmail.com, Ph. No:-690060xxxx



Test Report

Test Report No : DLL/PHE/Report/April/570
 Issued To : Principal of North Lakhimpur College
 Issue Date : 12/04/2023
 Customer Reference No. : 570
 Sample Collection on dated : 10/04/2023
 Sample received on dated : 10/04/2023
 Sample Description : Deep Tube Well
 Sample Type : Filter Water
 Sample Quantity : 1000 ml
 Sample Location : Canteen of North Lakhimpur College
 Date of Analysis started : 10/04/2023
 Date of Analysis Complete : 12/04/2023

Sl. No.	Parameter	Protocol Used	Results	IS: 10500:2012 (Second Revision)		Unit
				Desirable limit	Max. Permissible limit (In absence better alternate source)	
1	pH	IS: 3025: Part 11 @ 25 °C	6.82	6.5 – 8.5	No relaxation	pH Units
2	Total Dissolved Solids	IS: 3025: Part 16	140	500	2000	mg/L
3	Turbidity	IS: 3025: Part 10	0.54	1	5	NTU
4	Iron	APHA 3500- Fe B	0.067	0.3	No relaxation	mg/L
5	Nitrate	IS: 3025: Part 34	0.24	45	No relaxation	mg/L
6	Chloride	IS: 3025: Part 32	8.2	250	1000	mg/L
7	Total Hardness	IS: 3025: Part 21	68	200	600	mg/L
8	Total Alkalinity	IS: 3025: Part 23	64	200	600	mg/L
9	Fluoride	IS: 3025: Part 60	BDL	1.0	1.5	mg/L
10	Sulphate	IS:3025: Part 24	0.32	200	400	mg/L
11	Arsenic	IS 3025: Part 37	BDL	0.01	0.05	mg/L
12	Colour	IS: 3025: Part 4	2 HU	5	15	Hazen
13	Odour	IS: 3025: Part 5	Agreeable	Agreeable	Agreeable	
14	Taste	IS: 3025: Part 8	Agreeable	Agreeable	Agreeable	
15	Calcium	IS: 3025: Part 40	24	75	200	mg/L
16	Magnesium	APHA 3500- Mg B	44	30	100	mg/L

BDL (Below Detection Level)

Opinion: The Parameter Tested at Sl. No _____ in the test report does not meet the requirement of IS 10500:2012 (Second revision)

Notes:

- The results given above are related to the sample as received and tested in this laboratory. Reliability of sample lies with the sender.
- The test report cannot be regenerated/re-produced in whole or in part without written permission of Laboratory.
- The test report cannot be used for any publicity or any legal purpose.
- The test samples meant for chemical analysis will be disposed of after 15 days from the date of issue of test report unless until specifically requested by the customer for retaining over a longer period.

Sample analyzed by:

Abhee

Lab. Asstt. PHE
 North Lakhimpur, DLL

12/04/23

M. Deui

Quality Manager, PHE
 North Lakhimpur, DLL

12/04/23

Quality Manager, PHE
 North Lakhimpur, DLL

Fig. 4 Water quality test report of Canteen of North Lakhimpur College



District Level Laboratory, North Lakhimpur
 Address: Office of the Executive Engineer (PHE), North Lakhimpur
 Japisajaya, North Lakhimpur 787031
 E-mail.ID:laboratorynlp555@gmail.com, Ph. No:-6900600937



Test Report

Test Report No : DLL/PHE/Report/April/571
 Issued To : Principal of North Lakhimpur College
 Issue Date : 12/04/2023
 Customer Reference No. : 571
 Sample Collection on dated : 10/04/2023
 Sample received on dated : 10/04/2023
 Sample Description : Deep Tube Well
 Sample Type : Filter Water
 Sample Quantity : 1000 ml
 Sample Location : Chemistry department of North Lakhimpur College
 Date of Analysis started : 10/04/2023
 Date of Analysis Complete : 12/04/2023

Sl. No.	Parameter	Protocol Used	Results	IS: 10500:2012 (Second Revision)		Unit
				Desirable limit	Max. Permissible limit (in absence better alternate source)	
1	pH	IS: 3025: Part 11 @ 25 °C	7.01	6.5 – 8.5	No relaxation	pH Units
2	Total Dissolved Solids	IS: 3025: Part 16	160	500	2000	mg/L
3	Turbidity	IS: 3025: Part 10	0.82	1	5	NTU
4	Iron	APHA 3500- Fe B	0.091	0.3	No relaxation	mg/L
5	Nitrate	IS: 3025: Part 34	0.42	45	No relaxation	mg/L
6	Chloride	IS: 3025: Part 32	17.02	250	1000	mg/L
7	Total Hardness	IS: 3025: Part 21	70	200	600	mg/L
8	Total Alkalinity	IS: 3025: Part 23	56	200	600	mg/L
9	Fluoride	IS: 3025: Part 60	BDL	1.0	1.5	mg/L
10	Sulphate	IS:3025: Part 24	0.28	200	400	mg/L
11	Arsenic	IS 3025: Part 37	BDL	0.01	0.05	mg/L
12	Colour	IS: 3025: Part 4	2 HU	5	15	Hazen
13	Odour	IS: 3025: Part 5	Agreeable	Agreeable	Agreeable	
14	Taste	IS: 3025: Part 8	Agreeable	Agreeable	Agreeable	
15	Calcium	IS: 3025: Part 40	20	75	200	mg/L
16	Magnesium	APHA 3500- Mg B	50	30	100	mg/L

BDL (Below Detection Level)

Opinion: The Parameter Tested at Sl. No _____ in the test report does not meet the requirement of IS 10500:2012 (Second revision)

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Sample tested by:

[Signature]

Lab. Asst, PHE
 North Lakhimpur, DLL

12/04/23

[Signature]

Quality Manager, PHE
 North Lakhimpur, DLL

12/04/23
 Quality Manager, PHE
 North Lakhimpur, DLL

Fig. 5 Water quality test report of Chemistry Department of North Lakhimpur College



District Level Laboratory, North Lakhimpur
Address: Office of the Executive Engineer (PHE), North Lakhimpur
Japisajaiya, North Lakhimpur 787031
E-mail.ID:-laboratorynlp555@gmail.com, Ph. No:-6900600937



Test Report

Test Report No : DLL/PHE/Report/April/572
 Issued To : Principal of North Lakhimpur College
 Issue Date : 12/04/2023
 Customer Reference No. : 572
 Sample Collection on dated : 10/04/2023
 Sample received on dated : 10/04/2023
 Sample Description : Deep Tube Well
 Sample Type : Filter Water
 Sample Quantity : 1000 ml
 Sample Location : MRGGH
 Date of Analysis started : 10/04/2023
 Date of Analysis Complete : 12/04/2023

Sl. No.	Parameter	Protocol Used	Results	IS: 10500:2012 (Second Revision)		Unit
				Desirable limit	Max. Permissible limit (in absence better alternate source)	
1	pH	IS: 3025: Part 11 @ 25 °C	6.72	6.5 – 8.5	No relaxation	pH Units
2	Total Dissolved Solids	IS: 3025: Part 16	120	500	2000	mg/L
3	Turbidity	IS: 3025: Part 10	0.24	1	5	NTU
4	Iron	APHA 3500- Fe B	BDL	0.3	No relaxation	mg/L
5	Nitrate	IS: 3025: Part 34	0.14	45	No relaxation	mg/L
6	Chloride	IS: 3025: Part 32	14.18	250	1000	mg/L
7	Total Hardness	IS: 3025: Part 21	48	200	600	mg/L
8	Total Alkalinity	IS: 3025: Part 23	28	200	600	mg/L
9	Fluoride	IS: 3025: Part 60	BDL	1.0	1.5	mg/L
10	Sulphate	IS:3025: Part 24	0.34	200	400	mg/L
11	Arsenic	IS 3025: Part 37	BDL	0.01	0.05	mg/L
12	Colour	IS: 3025: Part 4	1 HU	5	15	Hazen
13	Odour	IS: 3025: Part 5	Agreeable	Agreeable	Agreeable	
14	Taste	IS: 3025: Part 8	Agreeable	Agreeable	Agreeable	
15	Calcium	IS: 3025: Part 40	20	75	200	mg/L
16	Magnesium	APHA 3500- Mg B	28	30	100	mg/L

BDL (Below Detection Level)

Opinion: The Parameter Tested at Sl. No _____ in the test report does not meet the requirement of IS 10500:2012 (Second revision)

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Sample tested by:

[Signature]

Lab. Asstt. PHE
 North Lakhimpur, DLL

12/04/23

[Signature]

Quality Manager, PHE
 North Lakhimpur, DLL

12/04/23

Quality Manager, PHE
North Lakhimpur, DLL

Fig. 6 Water quality test report of Mamoni Roysom Goswami Girls Hostel of North Lakhimpur College



District Level Laboratory, North Lakhimpur
 Address: Office of the Executive Engineer (PHE), North Lakhimpur
 Japisajaya, North Lakhimpur 787031
 E-mail: ID:-laboratorynlp555@gmail.com, Ph. No:-6900600937



Test Report

Test Report No : DLL/PHE/Report/April/573
 Issued To : Principal of North Lakhimpur College
 Issue Date : 12/04/2023
 Customer Reference No. : 573
 Sample Collection on dated : 10/04/2023
 Sample received on dated : 10/04/2023
 Sample Description : Deep Tube Well
 Sample Type : Filter Water
 Sample Quantity : 1000 ml
 Sample Location : IMGH
 Date of Analysis started : 10/04/2023
 Date of Analysis Complete : 12/04/2023

Sl. No.	Parameter	Protocol Used	Results	IS: 10500:2012 (Second Revision)		Unit
				Desirable limit	Max. Permissible limit (In absence better alternate source)	
1	pH	IS: 3025: Part 11 @ 25 °C	6.62	6.5 – 8.5	No relaxation	pH Units
2	Total Dissolved Solids	IS: 3025: Part 16	120	500	2000	mg/L
3	Turbidity	IS: 3025: Part 10	0.24	1	5	NTU
4	Iron	APHA 3500- Fe B	BDL	0.3	No relaxation	mg/L
5	Nitrate	IS: 3025: Part 34	0.16	45	No relaxation	mg/L
6	Chloride	IS: 3025: Part 32	15.6	250	1000	mg/L
7	Total Hardness	IS: 3025: Part 21	44	200	600	mg/L
8	Total Alkalinity	IS: 3025: Part 23	36	200	600	mg/L
9	Fluoride	IS: 3025: Part 60	BDL	1.0	1.5	mg/L
10	Sulphate	IS:3025: Part 24	0.24	200	400	mg/L
11	Arsenic	IS 3025: Part 37	BDL	0.01	0.05	mg/L
12	Colour	IS: 3025: Part 4	1 HU	5	15	Hazen
13	Odour	IS: 3025: Part 5	Agreeable	Agreeable	Agreeable	
14	Taste	IS: 3025: Part 8	Agreeable	Agreeable	Agreeable	
15	Calcium	IS: 3025: Part 40	32	75	200	mg/L
16	Magnesium	APHA 3500- Mg B	12	30	100	mg/L

BDL (Below Detection Level)

Opinion: The Parameter Tested at Sl. No _____ in the test report does not meet the requirement of IS 10500:2012 (Second revision)

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Sample tested by:

Rajee

Lab. Asstt, PHE
 North Lakhimpur, DLL

12/04/23

M. Devi

Quality Manager, PHE
 North Lakhimpur, DLL

12/04/23

Quality Manager, PHE
 North Lakhimpur, DLL

Fig. 7 Water quality test report of Indira Mira Girls Hostel of North Lakhimpur College

The water quality tests were carried out on filtered water extracted through deep tube well. The values of the reported parameters are within permissible limits.

The existing filtration system in the college seems to be effective as far as the results of the reported parameters are concerned. However, it is recommended that filter water should be exclusively used for all purposes.

9. NOISE LEVEL IN THE CAMPUS

Under the Air (Prevention and Control of Pollution) Act, 1981, noise is considered as a pollutant. Noise mostly occurs in two major situations: community noise and industrial noise. Community noise is also called environmental noise and is defined as the noise emitted from all the sources except the noise from the industrial sources. As per WHO noise quality guidelines, noise level values are summarized with regard to specific environments and effects. For each environment and situation, the guideline values take into consideration the identified health effects and are set, based on the lowest levels of noise that affect health (critical health effect). As far as community noise is concerned, the WHO guidelines recommend less than 35 dB(A) in classrooms which is important for good teaching and learning conditions. The noise level monitoring was carried out to assess the equivalent noise level (L_{eq}) in the North Lakhimpur College campus. The test was carried out for 60 sec in each location and the maximum, minimum and the average noise level readings were recorded. The noise monitoring was carried out at different buildings in different locations within the campus. Table 3 shows the average measured noise level in the campus.

Table 3 Noise level test in different locations

Sl. No.	Building/Block	No. of locations of noise measurement	Average noise level (dB)
1	Nasim Ali Hazarika Building (Assam Type)	12	52.4
2	Department of Physical Education (RCC)	4	52.6
3	Department of Home Science (Assam Type)	3	55.4
4	Department of Physics (RCC)	5	48.7
5	Department of Electronics (Assam Type)	4	56.7
6	Zoology Building (RCC)	5	66.4
7	Chemistry Building (RCC)	7	58.6
8	Labanya Charan Deka Building (RCC)	10	64.4
9	Botany Department (Assam Type)	9	44.3
10	Botany Department (RCC)	2	65.5

From the measured data as summarized in Table 3, it is observed that the ambient noise levels in certain locations is beyond the prescribed standard limit of 35 dB for classrooms as per WHO guidelines. The exceeding of maximum permissible limits in these areas can be attributed to the fact that these rooms are kept open to the surroundings through open windows and doors. Along with this, the noise emerging from vehicular movements through nearby roads lead to higher noise levels in the classrooms. Also, due to gathering of a large number of stakeholders for official works, the noise level in the administrative building is on the higher side. For maintenance of WHO recommended noise levels in the classrooms following steps may be taken.

- Closing of windows and doors during classes
- Installation of sound and echo insulation in rooms
- Replacing existing fans with silent fans/ air conditioners





10. FLORAL DIVERSITY OF THE COLLEGE CAMPUS



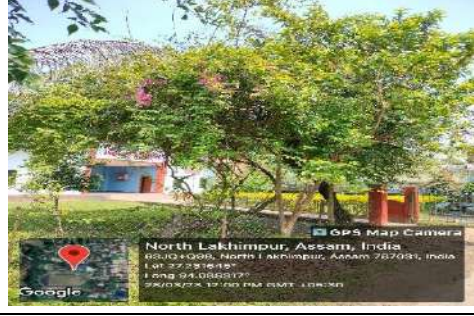
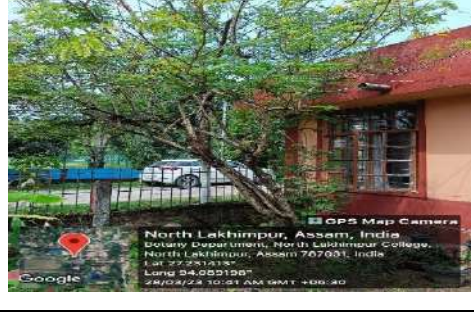

The campus is an example of co-existence of human and environment as it is rich in flora and faunal diversity. The campus area is vastly diverse with a variety of tree species having significant environmental role. These tree species are the integral part of the college. Most of these tree species are planted by the college authority through various tree plantation programs conducted in different periods of time. These trees have increased the quality of life by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife. The impact of these trees is seen not only within the college site but also on the surroundings of the college. They contribute to the environment by moderating the effects of the sun, rain and wind and by absorbing and filtering the sun's radiant energy and keeping the campus cool in summer. Many species of birds are dependent on these trees mainly for food and shelter. Thus, the college campus has been playing a significant role in maintaining the environment of entire North Lakhimpur town.



The study reveals that a total 102 numbers of floral species belonging to 51 families are found in the campus. The details of the floral species found in the college campus are given in Table 4.






Table 4 Floral Diversity of College Campus





Sl. No.	Details		Photograph
1	Name	Red wood tree	<p>North Lakhimpur, Assam, India 03.10.17M4, North Lakhimpur, Assam 787031, India Lat 27.230522° Long 94.089193° 28/03/23 12:33 PM GMT +05:30</p>
	Local Name	Ronga Chandan	
	Scientific Name	<i>Adenanthera pavonona</i> Linn.	
	Family	Fabaceae	
2	Name	Jack fruit	<p>North Lakhimpur, Assam, India 03JQ+Q35, North Lakhimpur, Assam 787031, India Lat 27.231704° Long 94.089193° 28/03/23 12:04 PM GMT +05:30</p>
	Local Name	Kothal	
	Scientific Name	<i>Artocarpus heterophyllus</i> Lam.	
	Family	Moraceae	
3	Name	Wood apple	<p>North Lakhimpur, Assam, India 03JQ+Q35, North Lakhimpur, Assam 787031, India Lat 27.231603° Long 94.089193° 28/03/23 08:13 AM GMT +05:30</p>
	Local Name	Bhel	
	Scientific Name	<i>Aegle marmelos</i> (L.) Correa.	
	Family	Rutaceae	
4	Name	Monkey Jack	<p>North Lakhimpur, Assam, India 03JQ+Q35, College Road, North Lakhimpur, Assam 787031, India Lat 27.23191° Long 94.089193° 28/03/23 02:27 PM GMT +05:30</p>
	Local Name	Bohot	
	Scientific Name	<i>Astocarpus lakoocha</i> Roxb.	
	Family	Moraceae	
5	Name	Indian oleander	<p>North Lakhimpur, Assam, India 03JQ+Q35, North Lakhimpur, Assam 787031, India Lat 27.230571° Long 94.089193° 28/03/23 03:05 PM GMT +05:30</p>
	Local Name	Asom Korobi	
	Scientific Name	<i>Nerium indicum</i>	
	Family	Apocynaceae	




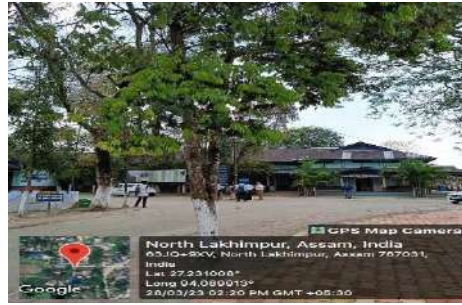

Sl. No.	Details		Photograph
6	Name	The Margosa tree	
	Local Name	Moha neem	
	Scientific Name	<i>Azadirachta indica</i> A. Juss.	
	Family	Meliaceae	
7	Name	Dita bark tree	
	Local Name	Chotiana	
	Scientific Name	<i>Alstonia scholaris</i> R. Br.	
	Family	Apocynaceae	
8	Name	Indian timber bamboo	
	Local Name	Bah	
	Scientific Name	<i>Bambusa tulda</i> (Roxb.)	
	Family	Poaceae	
9	Name	Cook	
	Local Name	Pine Gosh	
	Scientific Name	<i>Araucaria columnaris</i> J.R. Forst. Hook.	
	Family	Araucariaceae	
10	Name	Kanchan	
	Local Name	Boga kanchan	
	Scientific Name	<i>Bauhinia racemosa</i> Lam.	
	Family	Fabaceae	






Sl. No.	Details		Photograph
11	Name	Betel nut	
	Local Name	Tamul	
	Scientific Name	<i>Areca catechu</i> Linn.	
	Family	Palemae	
12	Name	Sugar palm	
	Local Name	Sagoo gosh	
	Scientific Name	<i>Arenga pinnata</i> Mderr.	
	Family	Palmeae	
13	Name	Paper flower	
	Local Name	Kagosh phool	
	Scientific Name	<i>Bougainvillea spectabilis</i> Comm.	
	Family	Nyctaginaceae	
14	Name	Paradise flower	
	Local Name	Krishna Chura	
	Scientific Name	<i>Caesalpinia pulcherrima</i> Swartz.	
	Family	Fabaceae	
15	Name	Bottle brush	
	Local Name	Botol burush gosh	
	Scientific Name	<i>Callistemon viminalis</i> R.Br.	
	Family	Myrtaceae	






Sl. No.	Details		Photograph
16	Name	The coconut palm	
	Local Name	Naricol	
	Scientific Name	<i>Cocos nucifera</i> Linn.	
	Family	Palmeae	
17	Name	Indian laburnum	
	Local Name	Sonaru	
	Scientific Name	<i>Cassia fistula</i> Linn.	
	Family	Fabaceae	
18	Name	Garden croton	
	Local Name	Patabahar	
	Scientific Name	<i>Codiaeum variegatum</i> (L.) Blume.	
	Family	Euphorbiaceae	
19	Name	Rattle wort	
	Local Name	Ghontakorna	
	Scientific Name	<i>Crotalaria retusa</i> Linn.	
	Family	Fabaceae	
20	Name	Assam rubber tree	
	Local Name	Atha bor	
	Scientific Name	<i>Ficus elastic</i> Roxb.	
	Family	Moraceae	

Sl. No.	Details		Photograph
21	Name	Royal poinciana	
	Local Name	Krishnasura	
	Scientific Name	<i>Delonix regia</i> (Boj.) Raf.	
	Family	Fabaceae	
22	Name	Elephant fruit	
	Local Name	Ou tenga	
	Scientific Name	<i>Dillenia indica</i> Linn.	
	Family	Dilleniaceae	
23	Name	Indian olive tree	
	Local Name	Jolphai	
	Scientific Name	<i>Elaeocarpus floribundus</i> Blume.	
	Family	Elaeocarpaceae	
24	Name	Hill teak	
	Local Name	Gomari	
	Scientific Name	<i>Gmelina arborea</i> Linn.	
	Family	Verbenaceae	
25	Name	Black plum	
	Local Name	Kolajamu	
	Scientific Name	<i>Eugenia jambolana</i> Lam.	
	Family	Myrtaceae	






Sl. No.	Details		Photograph
26	Name	Jasmine	 <p>North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787031, India Lat: 27.2214826° Long: 94.0092671° 28/03/23 02:08 PM GMT +05:30</p>
	Local Name	Gootomali	
	Scientific Name	<i>Jasminum laurifolium</i> Roxb.	
	Family	Olaeaceae	
27	Name	Jungle flame	 <p>North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787031, India Lat: 27.2312698° Long: 94.0492372° 28/03/23 10:46 AM GMT +05:30</p>
	Local Name	Rangan	
	Scientific Name	<i>Ixora coccinea</i> L.	
	Family	Rubiaceae	
28	Name	<i>Machilus</i>	 <p>North Lakhimpur, Assam, India Electronics Department, North Lakhimpur College, North Lakhimpur, Assam 787031, India Lat: 27.240464° Long: 94.088512° 28/03/23 02:42 PM GMT +05:30</p>
	Local Name	Chom	
	Scientific Name	<i>Machilus bombycina</i> King.	
	Family	Lauraceae	
29	Name	Pride of India	 <p>North Lakhimpur, Assam, India 630+9W2, North Lakhimpur, Assam 787031, India Lat: 27.240722° Long: 94.009722° 28/03/23 02:19 PM GMT +05:30</p>
	Local Name	Ajar	
	Scientific Name	<i>Lagerstroemia flos-reginae</i> Retz.	
	Family	Lythraceae	
30	Name	The Mango tree	 <p>North Lakhimpur, Assam, India 630+9W2, North Lakhimpur, Assam 787031, India Lat: 27.238664° Long: 94.009722° 28/03/23 02:08 AM GMT +05:30</p>
	Local Name	Am gosh	
	Scientific Name	<i>Mangifera indica</i> Linn.	
	Family	Anacardiaceae	






Sl. No.	Details		Photograph
31	Name	Litchi	
	Local Name	Lichu gosh	
	Scientific Name	<i>Litchi chinensis</i> Sonn.	
	Family	Sapindaceae	
32	Name	Silver pine	
	Local Name	Silver pine	
	Scientific Name	<i>Manoao colensoi</i> (Hook.) Molloi.	
	Family	Podocarpaceae	
33	Name	Indian trumpet flower	
	Local Name	Bhat ghila	
	Scientific Name	<i>Oroxylum indicum</i> Vent.	
	Family	Bignoniaceae	
34	Name	Indian rose chestnut	
	Local Name	Nahor	
	Scientific Name	<i>Mesua ferrea</i> L.	
	Family	Calophyllaceae	
35	Name	Indian Madlar	
	Local Name	Bokul	
	Scientific Name	<i>Mimusops elengi</i> Linn.	
	Family	Sapotaceae	






Sl. No.	Details		Photograph
36	Name	Chir pine	
	Local Name	Pine gosh	
	Scientific Name	<i>Pinus roxburghii</i> (Sarg.)	
	Family	Pinaceae	
37	Name	Drum stick tree	
	Local Name	Sojina	
	Scientific Name	<i>Moringa oleifera</i> Lamk.	
	Family	Moringaceae	
38	Name	Mast tree	
	Local Name	Debdaru	
	Scientific Name	<i>Polyalthia longifolia</i> Benth.	
	Family	Anonaceae	
39	Name	Mulberry	
	Local Name	Nuni	
	Scientific Name	<i>Morus indica</i> Linn.	
	Family	Moraceae	
40	Name	English guava	
	Local Name	Modhuri aam	
	Scientific Name	<i>Psidium guajava</i> L.	
	Family	Myrtaceae	





Sl. No.	Details		Photograph
41	Name	Indian curry leaf plant	
	Local Name	Norosingho	
	Scientific Name	<i>Murraya koenigii</i> Spreng.	
	Family	Rutaceae	
42	Name	Traveller's tree	
	Local Name	Domkol	
	Scientific Name	<i>Ravenala madagascariensis</i> Sonn.	
	Family	Musaceae	
43	Name	Banana plant	
	Local Name	Khol gosh	
	Scientific Name	<i>Musa paradisiaca</i> L.	
	Family	Musaceae	
44	Name	Castor oil plant	
	Local Name	Era gosh	
	Scientific Name	<i>Ricinus communis</i> Linn.	
	Family	Euphorbiaceae	
45	Name	Indian oleander	
	Local Name	Korobi	
	Scientific Name	<i>Nerium indicum</i> Mill.	
	Family	Apocynaceae	






Sl. No.	Details		Photograph
46	Name	Tree of sadness	
	Local Name	Sewali phool	
	Scientific Name	<i>Nyctanthes arbor-tristis</i> Linn.	
	Family	Oleaceae	
47	Name	Teak tree	
	Local Name	Sagoon	
	Scientific Name	<i>Tectona grandis</i> Linn. F.	
	Family	Verbenaceae	
48	Name	Yellow oleander	
	Local Name	Korobi phool	
	Scientific Name	<i>Thevetia peruviana</i> (Pers.) Schum.	
	Family	Apocynaceae	
49	Name	Hog plum	
	Local Name	Omora	
	Scientific Name	<i>Spondias mangifera</i> Willd.	
	Family	Anacardiaceae	
50	Name	Thuja	
	Local Name	Thuja gosh	
	Scientific Name	<i>Thuja orientalis</i> L.	
	Family	Cupressaceae	


Sl. No.	Details		Photograph
51	Name	Malay apple	
	Local Name	Pani jamu	
	Scientific Name	<i>Syzygium malaccense</i> (L.) Merr.	
	Family	Myrtaceae	
52	Name	Chaste tree	
	Local Name	Posotia	
	Scientific Name	<i>Vitex negundo</i> Linn.	
	Family	Verbenaceae	
53	Name	Rose apple	
	Local Name	Golapi jamu	
	Scientific Name	<i>Syzygium jambos</i> L. (Alston.)	
	Family	Myrtaceae	
54	Name	Dagger plant	
	Local Name		
	Scientific Name	<i>Yucca gloriosa</i> L.	
	Family	Asparagaceae	
55	Name	The Arjun tree	
	Local Name	Arjun gosh	
	Scientific Name	<i>Terminalia arjuna</i> Weight & Arn.	
	Family	Combretaceae	

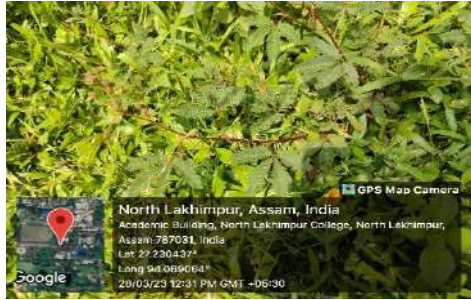




Sl. No.	Details		Photograph
56	Name	Indian jujube	 <p>North Lakhimpur, Assam, India 83JQ+Q35, North Lakhimpur, Assam 787031, India Lat 27.231738° Long 94.087882° 28/03/23 12:03 PM GMT +05:30</p>
	Local Name	Bogori	
	Scientific Name	<i>Zizyphus jujube</i> Lamk.	
	Family	Rhamnaceae	
57	Name	Devil's cotton	 <p>North Lakhimpur, Assam, India 83JF+QPS, Botanical Garden, North Lakhimpur College, North Lakhimpur, Assam 787031, India Lat 27.23181° Long 94.087168° 28/03/23 02:31 PM GMT +05:30</p>
	Local Name	Bonkopahi	
	Scientific Name	<i>Abroma augustum</i> (L.) L.f.	
	Family	Sterculiaceae	
58	Name	Garden asparagus	 <p>North Lakhimpur, Assam, India 83JF+QPS, Botanical Garden, North Lakhimpur College, North Lakhimpur, Assam 787031, India Lat 27.23181° Long 94.087168° 28/03/23 03:17 PM GMT +05:30</p>
	Local Name	Sotomol	
	Scientific Name	<i>Asparagus racemosus</i> Willd.	
	Family	Liliaceae	
59	Name	Aloe	 <p>North Lakhimpur, Assam, India 83JF+QPS, Botanical Garden, North Lakhimpur College, North Lakhimpur, Assam 787031, India Lat 27.23181° Long 94.087168° 28/03/23 01:28 PM GMT +05:30</p>
	Local Name	Chal kuori	
	Scientific Name	<i>Aloe barbadensis</i> Mill.	
	Family	Liliaceae	
60	Name	Carambola	 <p>North Lakhimpur, Assam, India 83JG+QPS, North Lakhimpur, Assam 787031, India Lat 27.231738° Long 94.088389° 28/03/23 12:00 PM GMT +05:30</p>
	Local Name	Kordoi	
	Scientific Name	<i>Averrhoa carambola</i> Linn.	
	Family	Oxalidaceae	






Sl. No.	Details		Photograph
61	Name	Indian aloe	
	Local Name	Chalkunwari	
	Scientific Name	<i>Aloe vera</i> (L.) Burm. F.	
	Family	Asphodelaceae	
62	Name	Miracle leaf	
	Local Name	Dooportenga	
	Scientific Name	<i>Bryophyllum calycinum</i> Salisb.	
	Family	Crassulaceae	
63	Name	Prickly chaff	
	Local Name	Tikoniborua lota	
	Scientific Name	<i>Buettneria aspera</i> Colebr.	
	Family	Sterculiaceae	
64	Name	Papaya	
	Local Name	Omita	
	Scientific Name	<i>Carica papaya</i> Linn.	
	Family	Caricaceae	
65	Name	Pine apple	
	Local Name	Matikothal	
	Scientific Name	<i>Ananas comsus</i> Merr.	
	Family	Bromaliaceae	






Sl. No.	Details		Photograph
66	Name	Indian pennywort	
	Local Name	Bormanimuni	
	Scientific Name	<i>Centella asiatica</i> (L.) Urban	
	Family	Apeaceae	
67	Name	The lemon	
	Local Name	Gol nemoo	
	Scientific Name	<i>Citrus lemon</i> (L.) Burm. F.	
	Family	Rutaceae	
68	Name	Quinine tree	
	Local Name	Quinine gosh	
	Scientific Name	<i>Cinchona officinalis</i> L.	
	Family	Rubiaceae	
69	Name	Indian glory bower	
	Local Name	Nepapu	
	Scientific Name	<i>Clerodendron colebrookianum</i> L.	
	Family	Lamiaceae	
70	Name	Dragon's tree	
	Local Name	Jom lakhuti	
	Scientific Name	<i>Dracaena angustifolia</i> Roxb.	
	Family	Liliaceae	

Sl. No.	Details		Photograph
71	Name	Thorny cactus	
	Local Name	Sijoo	
	Scientific Name	<i>Euphorbia nerifolia</i> Linn.	
	Family	Euphorbiaceae	
72	Name	Emblicmyrobalans	
	Local Name	Amlokhi	
	Scientific Name	<i>Emblica officinales</i> Geartn.	
	Family	Euphorbiaceae	
73	Name	Lawn pennywort	
	Local Name	Soru manimuni	
	Scientific Name	<i>Hydrocotyle rotundifolia</i> Roxb.	
	Family	Apeaceae	
74	Name	Indian balsam	
	Local Name	Koria bijol	
	Scientific Name	<i>Impatiens roylei</i> Walp.	
	Family	Balsaminaceae	
75	Name	Vasaka	
	Local Name	Bahok	
	Scientific Name	<i>Justicia adhatoda</i> L.	
	Family	Acanthaceae	



Sl. No.	Details		Photograph
76	Name	Fish mint	
	Local Name	Mochondori	
	Scientific Name	<i>Houttuynia cordata</i> Thumb.	
	Family	Peperaceae	
77	Name	Shrubby basil	
	Local Name	Ram tulosi	
	Scientific Name	<i>Ocimum gratissimum</i> Linn.	
	Family	Lamiaceae	
78	Name	Secred basil	
	Local Name	Kolia tulosi	
	Scientific Name	<i>Ocimum sanctum</i> Linn.	
	Family	Lamiaceae	
79	Name	Sweet mother wort	
	Local Name	Boga doron	
	Scientific Name	<i>Leucas linifolia</i> Spreng.	
	Family	Lamiaceae	
80	Name	Field mint	
	Local Name	Podina	
	Scientific Name	<i>Mentha arvensis</i> Linn.	
	Family	Lamiacea	

Sl. No.	Details		Photograph
81	Name	The sensitive plant	
	Local Name	Lajuki bon	
	Scientific Name	<i>Mimosa pudica</i> Linn.	
	Family	Fabaceae	
82	Name	Catch whisker	
	Local Name	Sursuriya	
	Scientific Name	<i>Cleome viscosa</i>	
	Family	Cleomaceae	
83	Name	Ashwagandha	
	Local Name	Sarpagandha	
	Scientific Name	<i>Withania somnifera</i> (L.) Dunal	
	Family	Solanaceae	
84	Name	Cycas	
	Local Name	Nagfol	
	Scientific Name	<i>Cycas pectinata</i>	
	Family	Cycadaceae	
85	Name	Sijjium	
	Local Name	Sijjium	
	Scientific Name	<i>Sijjiumsijjium</i>	
	Family	Myrtaceae	

Sl. No.	Details		Photograph
86	Name	English name: Azalea	 <p>GPS Map Camera North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787051, India Lat 27.231288 Long 94.009226 28/03/23 10:48 AM GMT +05:30</p>
	Local Name	Azalea	
	Scientific Name	<i>Rhododendron</i>	
	Family	Ericaceae	
87	Name	Kathana plant	 <p>GPS Map Camera North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787051, India Lat 27.231406 Long 94.009226 28/03/23 10:50 AM GMT +05:30</p>
	Local Name		
	Scientific Name	<i>Tabernaemantana divericata</i>	
	Family		
88	Name	Purple jasmine	 <p>GPS Map Camera North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787051, India Lat 27.231424 Long 94.009226 28/03/23 10:50 AM GMT +05:30</p>
	Local Name	Purple jasmine	
	Scientific Name	<i>Juasminum sambac</i>	
	Family	Oleaceae	
89	Name	Goat weed	 <p>GPS Map Camera North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787051, India Lat 27.231681 Long 94.009227 28/03/23 12:00 PM GMT +05:30</p>
	Local Name		
	Scientific Name	<i>Scoparia dulcis</i>	
	Family	Plantaginaceae	
90	Name	Chebolic myrabolan	 <p>GPS Map Camera North Lakhimpur, Assam, India Botany Department, North Lakhimpur College, North Lakhimpur, Assam 787051, India Lat 27.231426 Long 94.009226 28/03/23 12:28 PM GMT +05:30</p>
	Local Name	Silikha	
	Scientific Name	<i>Terminalia chebula</i>	
	Family	Combretaceae	

Sl. No.	Details		Photograph
91	Name	Rain tree	
	Local Name	Rain tree	
	Scientific Name	<i>Samanea saman</i>	
	Family	Fabaceae	
92	Name	Black nightshade	
	Local Name	Bhekuri tita, Kkochi Los Koshi	
	Scientific Name	<i>Solanum nigrum</i>	
	Family	Solanaceae	
93	Name	Turkey berry	
	Local Name	Bhit tiata, Hati bhekuri	
	Scientific Name	<i>Solanum torvum</i>	
	Family	Solanaceae	
94	Name	Oxalis	
	Local Name	Tengashi tenga	
	Scientific Name	<i>Oxalis recardia</i>	
	Family	Oxalidaceae	
95	Name	Ginger plant	
	Local Name	Ada	
	Scientific Name	<i>Zingiber officinales</i>	
	Family	Zingiberaceae	

Sl. No.	Details		Photograph
96	Name	Jimson weed	
	Local Name	Datura	
	Scientific Name	<i>Datura stramonium</i>	
	Family	Solanaceae	
97	Name	Tamarind	
	Local Name	Teteli tenga	
	Scientific Name	<i>Tamarindus indica</i>	
	Family	Fabaceae	
98	Name	Crown of thorn, Christ plant	
	Local Name	Sijoo	
	Scientific Name	<i>Euphorbia milii</i>	
	Family	Euphorbiaceae	
99	Name	Opuntia	
	Local Name	Sagarpina	
	Scientific Name	<i>Opuntia dileni</i>	
	Family	Cactaceae	
100	Name	Vasaka	
	Local Name	Boga bahok	
	Scientific Name	<i>Justicia adhatoda</i>	
	Family	Acanthaceae	


Sl. No.	Details		Photograph
101	Name	Fox-tail orchid	
	Local Name	Kopou phul	
	Scientific Name	<i>Rhynchosstylis retusa</i> (L.) Blume	
	Family	Orchidaceae	
102	Name	Inch plant	
	Local Name	Tradescantia	
	Scientific Name	<i>Tradescantia zebrina</i>	
	Family	Ommelinaceae	






11. FAUNAL DIVERSITY OF THE CAMPUS






Assam is considered as biodiversity “hot spot” in the country. Favorable climate condition, topography and different other factors result in a diversity of ecological habitats such as forests, grasslands and wetlands.



The college campus is inhabited by various faunal species. It is worth mentioning that the eastern boundary of the campus has a large tree cover with the Sumdiri river flowing along the boundary, which has been reported to be visited by a number of migratory birds. Considering this the College authority has maintained it as a dedicated area for plantation reflecting the consciousness and contribution towards environmental sustainability. Apart from the migratory birds, various other faunal species are found in the campus as listed in Table 5.

Table 5 Faunal Diversity of College Campus

Sl. No.	Details		Photograph
1	Common Name	Earth worm	
	Scientific Name	<i>Lumbricus terrestris</i>	

Sl. No.	Details		Photograph
2	Common Name	Red ant	
	Scientific Name	<i>Solenopsis invicta</i>	
3	Common Name	Psyche	
	Scientific Name	<i>Leptosia nina</i>	
4	Common Name	Marbled white	
	Scientific Name	<i>Nyctemera coletas</i>	
5	Common Name	Copper headed trinket	
	Scientific Name	<i>Coelognathus radiatus</i>	
6	Common Name	Common Mormon	
	Scientific Name	<i>Princeps polytes</i>	

Sl. No.	Details		Photograph
7	Common Name	Black Hooded Oriole	
	Scientific Name	<i>Oriolus Xanthornus</i>	
8	Common Name	White Breasted Waterhen	
	Scientific Name	<i>Amaurornis Phoenisurus</i>	
9	Common Name	White Throated Kingfisher	
	Scientific Name	<i>Halcyon Smyrnenis</i>	
10	Common Name	Barn Owl	
	Scientific Name	<i>Tyto Alba</i>	
11	Common Name	Little Cormorant	
	Scientific Name	<i>Phalacrocorex Niger</i>	

Sl. No.	Details		Photograph
12	Common Name	White Wagtail	
	Scientific Name	<i>Motacilla Alba</i>	
13	Common Name	Colubrid Snake	
	Scientific Name	<i>Chrysopelea Ornata</i>	

12. WASTE DISPOSAL SYSTEM OF THE COLLEGE

Waste management system comprises of various waste disposal activities including waste collection, transportation, treatment and disposal. At present solid wastes in the form of wastepaper and fallen tree leaves are the major waste generated in the college along with minor amounts of laboratory organic and inorganic waste. The bathroom liquid waste is fed to soak pits. The canteen and hostels produce a mix of organic and inorganic waste. From the estimation of solid waste generated by different parts of the institution, it has been observed that, nearly 440 kg of biodegradable and 11.25 kg of non-biodegradable waste are generated in the campus per month. A sizeable fraction (nearly 50%) of the biodegradable solid waste primarily containing the fallen leaves and papers are recycled by composting in the vermicomposting unit of the college (Fig. 8). Compost thus produced is also utilized by the college as organic manure for saplings.

Some of the non-biodegradable wastes are being sold as scrap for recycling. There are nearly 50 waste collection bins across the entire college campus. The college has signed an MoU with the North Lakhimpur Municipal Board, according to which the latter collects all laboratory waste and waste from the hostels for disposing them properly in regular intervals. Two incinerators for disposal of sanitary napkins, one in the Girls' Common room and the other in the Girls' Hostel are also installed (Fig. 9).



Fig. 8 Vermicomposting units in the campus

It is observed that the college has taken up some initiatives for managing the generated waste. However, there is scope for improvement of the present waste collection and disposal practice. It is recommended that waste segregation practice be followed in the college campus. The standard practice of having different colored bins for different types of wastes may be adopted. It is suggested that Red Dustbins be used for collecting waste that is not biodegradable; Green Dustbin for wet and biodegradable wastes and Blue



Incinerator 1 at Girl’s Common Room



Incinerator 2 at Girl’s Hostel

Fig. 9 Incinerators installed in the campus

Dustbin for dry and non-biodegradable wastes. Source segregation of waste will allow for devising a mechanism for safe disposal/recycling of the non-biodegradable fraction of waste. The biodegradable fraction may be used for waste conversion practices like biogas which will help replacing some amount of the LPG used in the Canteen and Hostels along with the production of manure. E-waste (out of order equipment’s or obsolete items like laboratory instruments, electronic circuits, computer desktops or different computer components, laptops and accessories, printer and cartridges, charging cables,

Wi-fi devices and cables, CCTV components, sound systems, display units, UPS and battery, biometric machine, scientific instruments etc.) disposal should be done through authorized vendors.

13. VEHICULAR MOVEMENTS

It was estimated that on an average around 80-100 four wheelers and 700-800 two wheeler vehicles have a regular movement in the campus every day. Considering this, the college may adopt a 'Walk to the College' initiative on a designated day every week on which all members of the college within the vicinity of the college can come to the college walking and those staying away can use mass transport to reach the college. No vehicles (excluding visitor's) will be allowed in the campus on the designated day of the week thereby contributing towards environmental sustainability.

14. ELECTRICAL POWER CONSUMPTION AND ENERGY CONSERVATION INITIATIVES

The College draws power from the electricity grid of Assam Power Distribution Company Ltd. (APDCL) through a high tension connection with a total connected load of 129 kW. The electrical power consumption of North Lakhimpur College from February, 2022 to February, 2023 is shown in Table 6. This is supported by a power backup system consisting of 8 nos. of Diesel Generators as detailed in Table 7.

Table 6 Energy consumption of North Lakhimpur College

Sl. No.	Bill Duration	Electricity Consumption in KWh	Bill Amount (₹)
1	1/2/2023-28/2/2023	7057	91208.00
2	1/1/2023-31/1/2023	5796	82298.00
3	1/12/2022-31/12/2022	6483	92053.00
4	1/11/2022-30/11/2022	8190	100161.00
5	1/10/2022-31/10/2022	12175	132792.00
6	1/9/2022-30/9/2022	14986	159578.00
7	1/8/2022-31/8/2022	15466	164014.00
8	1/7/2022-31/7/2022	10874	121951.00
9	1/6/2022-30/6/2022	13046	138323.00
10	1/5/2022-31/5/2022	12658	134244.00
11	1/4/2022-30/4/2022	7601	92938.00
12	1/3/2022-31/3/2022	11787	118392.00
13	1/2/2022-28/2/2022	7241	81191.00

Table 7 Details of diesel generators

Generator Details					
Make of the Generator	Rating (kW)	Year Purchased	Annual fuel consumption (2022-2023)		Generator annual maintenance done/not done
			Amount (l)	Cost (Rs.)	
Kirloskar Oil Engines Limited Model: KG25AS-C	20	2015	1050.45	92,964.00	Yes
Kirloskar Oil Engines Limited Model: KG1-40WS	32	2013			Yes
Kirloskar Oil Engines Limited Model: KG1-40WS	32	2014			Yes
Kirloskar Oil Engine Limited Model: KG1-30WS	24	2014			Yes
Kirloskar Oil Engine Limited Model: KG15AS1-C	12	2017			Yes
Kirloskar Oil Engine Limited Model: KG 25AS-C	20	2017			Yes
Kirloskar Oil Engine Limited Model: KG 35AS	28	2018			Yes
Kirloskar Oil Engine Limited Model: KG 1-40WS	32	2018			Yes

Keeping in view of the available rooftop area, it is suggested that the College Authority may install renewable energy generation systems (Solar, Biogas, etc.) to substitute a sizeable fraction of their electricity requirement, which in turn will be another green and environmentally benign practice of the institute. It was brought to the notice of the Audit team that already the Institute has procured some Solar PV system, but the installation and commissioning of the same is yet to be done. Necessary steps may be taken to expedite the same.

15. ROUTINE GREEN PRACTICES

The college has taken up many green practices to augment its contribution towards environmental sustainability. Some salient points highlighting the routine green practices of the college are summarized below.



Fig. 10 Solar Street lights installed in the college campus

1. *Solar Lights:* Solar Street lights are installed in some locations of the college campus (Fig. 10).
2. *Rain water harvesting facilities:* Two numbers of rain water harvesting facilities are available (Fig. 11). One in the Zoology Department and the other in the backside of teachers' common room.



Fig. 11 Rain water harvesting systems in the college campus

3. *Green Policy:* College has its own green policy dedicated for the green initiatives in and around the college campus. A copy of the green policy of North Lakhimpur College is available in the college website.
(https://nlc.ac.in/uploads/files/policy/green_initiative_policy.pdf)
4. *Pedestrian friendly roads:* The roads are pedestrian friendly to make inter-building movement smooth for people and thus avoiding the unnecessary use of vehicles.

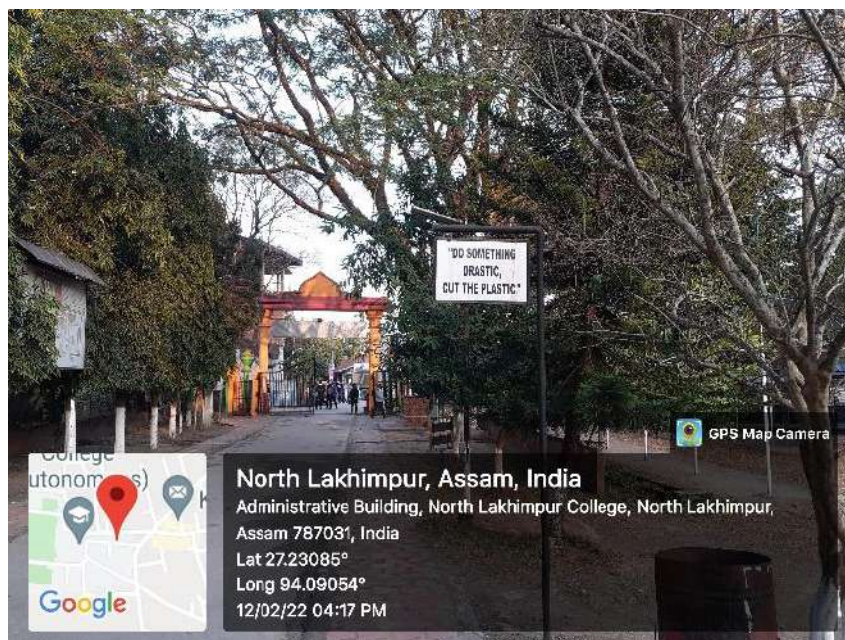


Fig. 12 Signage discouraging the use of plastic in the campus

5. *Plastic free campus*: The use of plastic is restricted and discouraged in the college campus (Fig. 12). For instance, in the two establishments of the college requiring packaging: the college book shop uses paper for wrapping goods sold and the college canteen uses plastic above 50-micron thickness only when extremely essential. The use of paper in daily functioning of the college office is limited by gradually moving towards a paperless mode.
6. *Green landscaping with trees and plants*: The College has been taking plantation drives in all major occasions not only in different parts the college but in different locations of Lakhimpur district also. Plantation drives are conducted on major occasions such as World Environment Day, College annual sports, NCC Day, NSS Day etc. (Fig. 13). The results are very inspiring with many migratory birds being spotted in different parts of the college campus.



Fig. 13 Plantation drives carried out on various occasions

The college strictly follows and monitors a criteria of the State Government for free admission in which the student has to plant a tree sampling in any suitable area and follow up its growth for becoming eligible for free admissions in the subsequent classes.

The college, through the Department of Assamese, has signed an MoU with Nature's Backon on 6th June 2022 to jointly carry out environmental studies and research related to nature's literature. Through the MoU, both the parties have agreed to provide "Jagindra Mohan Nature's literature award", an annual award to those who make significant contribution to nature related literature.

7. *Programmes related to environment awareness*: Seminars/workshops are regularly organized by the college for various stakeholders to create awareness regarding environmental sustainability. The college has introduced 15 courses in different

programmes related to environment to inculcate awareness for the preservation and improvement of environment. Some of the courses are highlighted below.

- i) Environmental Studies, BPS-GE-T6-301 (3rd Semester, BPES)
- ii) Green and Sustainable Chemistry, MCHE-GE-T3-301(3rd Semester, PG Chemistry)
- iii) Environmental Economics, ECO-CC-T6-602 (6th Semester Economics)
- iv) Environmental Geography and Oceanography, GEO-CC-6-301 (3rd Semester Geography).

8. *Extension Activities conducted on Environment Awareness:* Various outreach activities relating to environment promotional are carried out by the college. Some highlights of such activities are detailed below.

- i. *Role of Youth in Environment Protection* conducted on 10/1/2022 by the Department of Assamese and NSS in collaboration with Kakoi Rajgarh High School, Nature's Backon (Fig. 14 (A)).
- ii. *Awareness Programme on Tarioni Bill (Dirpai) and Water Quality Testing with respect to plankton and Fishes*, an extension programme conducted on 5/3/2022 by Department of Zoology, NSS in collaboration with Local bodies of the village (Fig. 14 (B)).
- iii. *Extension Programme conducted on Bird Conservation* by the Department of Assamese, NSS in collaboration with Lakhimpur Regional Agriculture Research Centre (LRARC) in which Dr. Prabal Saikia, Chief Scientist, LRARC was present as the resource person.
- iv. Conducted *Cleanliness Drive* in the Satajan bird sanctuary of Pohumara on 11/4/2022 by the Department of Zoology, NSS in collaboration with Village Local Bodies (Fig. 14 (C)).
- v. A mass plantation drive was conducted in Dirgha Naharbari Area on 12/5/2022 by Department of Zoology, NSS in collaboration with Local Village Bodies, Department of Forest (Fig. 14 (D)).



(A)



(B)



(C)



(D)



Fig. 14 Extension Activities conducted on environment awareness: (A) Talk on “ *Role of Youth in Environment Protection*”, (B) Extension programme on “*Awareness on Tarioni Bill (Dirpai) and Water Quality Testing with respect to plankton and Fishes*”, (C) *Cleanliness Drive* in the Satajan bird sanctuary of Pohumara, (D) *Mass plantation drive* in Dirgha Naharbari Area.

16. EXPENDITURE ON GREEN INITIATIVES

As per data provided by the College Authorities, an amount of Rs. 12.55 lakh has been spent in the plantation programmes, organization of seminars, workshops and environment related extension activities in the last twelve months.

17. RECOMMENDATIONS

We have conducted a green audit at the North Lakhimpur College. The study comprises of data collection and monitoring through personal visits. Overall, it was observed that the college is performing satisfactorily in terms of playing its role in environmental sustainability. As an educational institution of reputation, it is taking several encouraging initiatives that can make significant contributions towards dealing with current environmental challenges, which is promising. We have made the following recommendations so that the college can have more impact in achieving its sustainability goals and thus can be a major player in practicing environmental sustainability.

- The current waste collection and disposal practices have room for improvement. It is recommended that waste segregation be practiced on college campuses by using specified coloured bins for different types of waste.
- It is suggested that the College Authority install small decentralized renewable energy generation systems in the campus which can supplement to their total electricity needs. The college can install solar energy system and take advantage of the available rooftop space. Further, the segregated biodegradable fraction of waste generated in the campus may be treated in small scale 'biogas digester' for producing 'biogas'. This biogas can be utilized on site as energy source to replace some of the LPG used in the Canteen and Hostels, while also producing manure to be used in the college campus. These would be eco-friendly and environmentally responsible actions taken by the institute.
- E-waste disposal should be done through authorized vendors.
- To maintain the WHO recommended noise levels in the classrooms, college can install sound and echo insulation in rooms and can replace existing fans with silent fans/ air conditioners.
- Being a campus with rich flora diversity, college may highlight the utilization or valuable use of some flora species in public spaces for knowledge and awareness.