

JUNE 20, 2023

GREEN AUDIT REPORT, NAZIR AJMAL MEMORIAL COLLEGE OF EDUCATION, HOJAI

SUBMITTED TO
THE PRINCIPAL
NAZIR AJMAL MEMORIAL COLLEGE OF EDUCATION
HOJAI, ASSAM 782435



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



Acknowledgement

We are sincerely thankful to the Management of Nazir Ajmal Memorial College of Education for giving us the opportunity to conduct Green Audit of the Institute.

We are also grateful to Dr. Ashis Saha, Principal, Nazir Ajmal Memorial College of Education, Hojai, 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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Ref. No. Cert./2023/004

Date: 20/06/2023

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 NAZIR AJMAL MEMORIAL COLLEGE OF EDUCATION, HOJAI, ASSAM – 782435.

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 appreciated.

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



1. INTRODUCTION

Energy is required for the maintenance and sustenance of quality of life. Fossil fuel is a major source of this energy. However, over exploitation of fossil fuels is one of the primary causes of climate change. This necessitates implementation of green measures by all societal stakeholders, and higher education institutions play a more significant role in this.

Nazir Ajmal Memorial College of Education (NAMCE), Hojai 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 NAMCE 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.
- Air quality analysis.
- 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 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 13th May, 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
- Air quality 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
- Air quality analysis of the College
- Noise level of the College

Step 5 - Data Analysis

- Analysis of land use land cover data
- Weather data analysis (Average ambient temperature and humidity analysis)
- Air quality analysis (PM 2.5, PM10, CO₂, and HCHO)
- 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 environmental and energy 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

Nazir Ajmal Memorial College of Education was established by Ajmal foundation in the year 2014. The College is located in a rural area vocalising its vision- Education for all. It is located in Barpukhuri, Jugijan road, Hojai. The latitude and longitude coordinates are 26.017342 and 92.83949 respectively. The College is approximately 100 m away from the Hojai- Jugijan – Jamunamukh connecting road and only 2.7 km away from the Hojai railway station. It is the only Teacher Training College in this locality which has been

imparting education to the educators to equip them with the appropriate knowledge, habits, attitudes and values.



Fig. 1 Google Earth Map of Nazir Ajmal Memorial College of Education

At present the College has 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.

6. LAND USE ANALYSIS

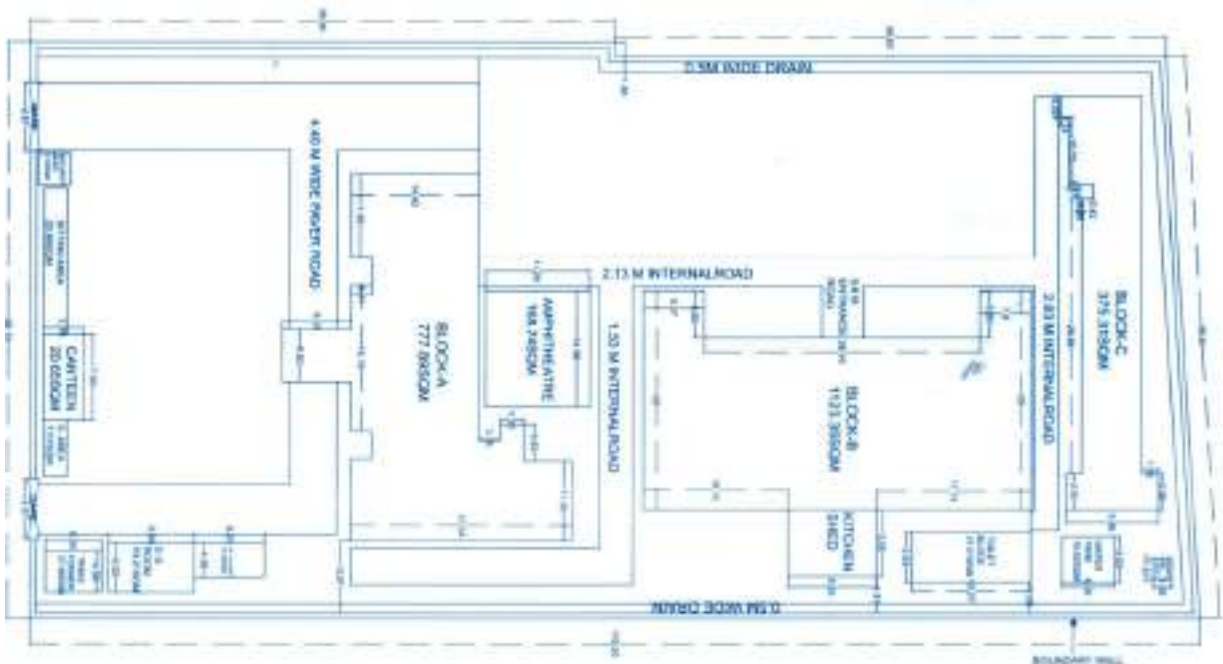


Fig. 2 Site plan of Nazir Ajmal Memorial College of Education

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. The site plan of the College is shown in Fig. 2. The main campus area of the College is built upon 3.749 acres of land. The built up area is 6661.02 m². 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 with varieties of timber, fruit yielding plants, ornamental and medicinal plants. The building details of the college are summarized in Table 1.

Table 1 Building details

Sl. No.	Room	Room Type	Room Area (m ²)	Used as
1	Principal's room	RCC	57.9	Principal's Room
2	Staff room	RCC	63.6	Staff Room
3	Office room	RCC	24	Office Room
4	Management room	RCC	24	Management Room
5	Room 101	RCC	72.61	Class room
6.	Room 102	RCC	72.61	Smart Class room-
7.	Library	RCC	79.5	Library
8.	Science lab	RCC	84.13	Composite Science Lab
9.	Store room	RCC	9.41	Store Room-1
10.	Language Lab	RCC	19.41	Language Lab
11.	Seminar hall	RCC	114.55	Seminar Room
12.	Curriculum Lab	RCC	63.6	Curriculum Lab
13.	Departmental store	RCC	8	Departmental Store
14.	Store room	RCC	16	Store Room-2
15.	Conference hall	RCC	70.02	Conference Hall
16.	Girls Common Room	RCC	57.9	Girls Common Room
17.	Vice principal room	RCC	17.4	Vice Principal Room
18.	Room 201	RCC	66.25	Class Room
19.	Computer lab	RCC	77.59	Computer Lab
20.	Room 202	RCC	98.58	Class Room
22.	Music room	RCC	26	Music Room
23.	Examination Cell	RCC	24	Examination Cell
24.	Multipurpose hall	RCC	248.04	Multipurpose Hall
25.	Room 301	RCC	50.02	Class Room
26.	Art and craft resource centre	RCC	62.7	Art & Craft Resource Centre
27.	Boys Common Room	RCC	41.4	Boys Common Room
28.	Health and physical resource centre	RCC	114.55	Health and Physical Resource Centre

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 the 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 61.5 % to 85.25%.

Table 2 Variation of monthly temperature and relative humidity in the 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. NAMCE uses ground water for their daily needs. The College has a water pumping and treatment plant (Fig. 3) through which water is supplied 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.



Fig. 3 Water treatment plant of Nazir Ajmal Memorial College of Education

Water quality test was carried out by the District Level Laboratory (NABL accredited), Public Health Engineering, Hojai for Nazir Ajmal Memorial College of Education. The reports of the same are shown in Fig. 4.

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.

30/03, 12:48 PM WQMS

Jal Jeevan Mission
Haritha Jal

Hojai SDLL
C/O The Executive Engineer (P&K), Hojai division, Hojai, Assam; pin-781005 (Test Address only)

Test report
Sample ID: LT15M079L52615102887

User Information

Name: Nazir Ajmal Memorial College Of Education Mobile: 9101072547
Email: principal.namc@gmail.com Pin Code:
Full Address: Village-Borpuhat (II), Gram Panchayat-Borpuhat, Block-Jugjan, District- Hojai, State-Assam

Sample description

Source of Sample: Tube well / Bore well / Well Village: Borpuhat (II)
Gram Panchayat: Borpuhat Block: Jugjan
District: Hojai State: Assam
Address: Remarks:
Latitude: Longitude:

Date & time of sample collection: 27.03.2023 | 11:25:00 AM Date & time of sample received in lab: 28.03.2023 | 10:15:00 AM Date & time of sample analysed: 01.03.2023 | 03:30:00 PM Date & time of report generation: 30.03.2023 | 12:48:36 PM

Test results

Sr. No.	Parameter tested	Unit of measurement	Regulatory (mandatory) limits as per IS 15026	Permissible limit on absence of adequate facilities as per IS 15026	Test result value	Remarks
1	Chloride (as Cl) ⁻	mg/l	250	1000	34.000	
2	Colour ^o	Hazen units	5	15	10.000	
3	E. coli	CFU/100 ml	Shall not be detectable in any 100 ml sample	No Relaxation	0.000	
4	Fluoride (as F) ⁻	mg/l	1	1.5	0.70	
5	Free residual Chlorine	mg/l	0.2	1	0.000	

https://ajshdli.gov.in/WQMS/CommonFinal_report_print.php_M4Ex2RvwG7Tncp13U8w==

Fig. 4(a) Water quality test report of Nazir Ajmal Memorial College of Education

12/03/2023 12:48 PM

WQMS

Sl. No.	Parameter being tested	Units of measurement	Recommended (Acceptable limit) as per BIS 10500	Permissible limit (in absence of reference) as per BIS 10500	Test result value	Remarks
6	Iron (As Fe)	mg/l	1	No Relaxation	0.200	
7	Odour*	NA	Agreeable	Agreeable	0.000	
8	pH*	NA	6.5-8.5	No Relaxation	7.210	
9	Taste*	NA	Agreeable	Agreeable	0.000	
10	TDS*	mg/l	500	2000	180.000	
11	Total Alkalinity (as Calcium Carbonate)*	mg/l	200	600	64.000	
12	Total Hardness (As CaCO ₃)*	mg/l	200	600	54.000	
13	Turbidity*	NTU	1	5	2.000	

Note:

- (*)Indicative parameters that are NOT described.
- This test results related to the sample tested above.
- The report shall not to be reproduced in full without approval of authority.
- This is the end of the report.

Authorized signatory
SAYANKA BOSE (Test Lab Incharge)

Jal Jeevan Mission aims at potable tap water supply to every home
Let's join hands to ensure drinking water is potable. It helps in preventing water borne diseases and improve public health.

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Fig. 4(b) Water quality test report of Nazir Ajmal Memorial College of Education

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 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	Average noise level (dB)
1	Principal's room	55.67
2	Staff room	64.07
3	Office room	61.34
4	Management room	59.3
5	Room 101	69.2
6.	Room 102	71.75
7.	Library	59.37
8.	Science lab	44.37
9.	Store room	40.34
10.	Language Lab	73.6
11.	Seminar hall	47.34
12.	Curriculum Lab	40.37
13.	Departmental store	45.36
14.	Store room	48.37
15.	Conference hall	48.34
16.	Girls Common Room	47.38
17.	Vice principal room	46.23
18.	Room 201	70.4
19.	Computer lab	67.03
20.	Room 202	79.47
22.	Music room	68.6
23.	Examination Cell	67.3
24.	Multipurpose hall	71.93
25.	Room 301	71.5
26.	Art and craft resource centre	68.8
27.	Boys Common Room	63.6
28.	Health and physical resource centre	59.9

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. AIR QUALITY ASSESSMENT

For air quality monitoring three parameters namely Particulate Matter (PM 2.5 and 10), Carbon dioxide (CO₂), and Formaldehyde (HCHO) were considered for measurement in the College campus. PM stands for particulate matter, often known as particle pollution, which is the word used to describe an airborne mixture of solid and liquid droplets. Dust, dirt, soot, and smoke are examples of particles that are large enough or dark enough to be visible to the unaided eye. Others can only be seen with an electron microscope because they are extremely small.

Inhalable particles with diameters of 10 micrometers or less are referred to as PM₁₀, while fine inhalable particles with diameters of 2.5 micrometers or less are referred to as PM_{2.5}. Particulate matter is made up of microscopic solid or liquid droplets that are so minute that breathing it in can have significant adverse impacts on a person's health. PM₁₀ have the potential to travel deep into the lungs and potentially into the bloodstream. The greatest threat to health comes from fine particles, also known as PM_{2.5}.

CO₂ is not considered as a pollutant as it occurs naturally in the air. However, increased levels of CO₂ have various detrimental effects. Simply put, as the amount of CO₂ in a tight space increases, it substitutes for the oxygen the body needs to survive. The body slows down and performs poorly when it cannot acquire enough oxygen. CO₂ primarily impacts the brain since it is an asphyxiant. Exposure to CO₂ can produce a variety of health effects. These may include headaches, dizziness, restlessness, a tingling or pins or needles feeling, difficulty breathing, sweating, tiredness, increased heart rate, elevated blood pressure, coma, asphyxia, and convulsions.

Volatile organic compounds like formaldehyde, or HCHO, can contaminate the indoor air in a closed space. Total volatile organic compounds (TVOC) are made up of a variety of chemicals, including formaldehyde. Formaldehyde is produced naturally and expelled

during metabolism. This volatile organic chemical is one among the most hazardous ones that can be discovered in the air. Formaldehyde exposure on a regular basis or for an extended amount of time can result in adverse effects on health. Nasal irritation, headaches, eye discomfort, and respiratory tract irritation are a few of the health problems that can result from exposure to formaldehyde. High quantities could possibly cause serious, lifelong health problems. In addition, it's important to be aware that formaldehyde is a toxin that might cause leukaemia, tracheal cancer, and nasal cancer.

The air quality monitoring test was conducted with the help of air quality meter Temtop-M 2000. This instrument is sensitive to the size of particles of aerodynamic diameter of 2.5 μm and 10 μm . All the pollutant concentrations were recorded for 60 seconds in the memory of the instrument, which were further downloaded and analyzed. 5 major locations within the campus were selected and the readings of PM_{2.5}, PM₁₀, CO₂ and HCHO were recorded.

The average particulate matter PM₁₀ was observed to be 82.73 $\mu\text{g}/\text{m}^3$ and PM_{2.5} was observed to be 56.75 $\mu\text{g}/\text{m}^3$ which is lower than the permissible limits of CPCB Ambient Air Quality Standards of 100 $\mu\text{g}/\text{m}^3$ and 60 $\mu\text{g}/\text{m}^3$, respectively. The average CO₂ level was 654.93 ppm and HCHO level was 0.06 mg/m^3 which are within acceptable standard limits. In the college campus, the major source of PM₁₀ and PM_{2.5} might be the dust from vehicular traffic, construction, and burning.

11. 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.

The study reveals that a total 38 numbers of floral species belonging to 34 families are found in the campus (Table 4).

Table 4 Floral Diversity of College Campus

Sl. No.	Details		Photograph
1	Name	Aloe wood	
	Local Name	Agaru	
	Scientific Name	<i>Aquilaria malaccensis</i>	
	Family	Thymelaeaceae	
2	Name	Litchi	
	Local Name	Lichu	
	Scientific Name	<i>Litchi chinensis</i>	
	Family	Sapindaceae	
3	Name	Mast tree	
	Local Name	Debdaru	
	Scientific Name	<i>Polyalthia longifolia</i> Benth.	
	Family	Anonaceae	
4	Name	Indian Madlar	
	Local Name	Bokul	
	Scientific Name	<i>Mimusops elengi</i> Linn.	
	Family	Sapotaceae	
5	Name	Christmas tree	
	Local Name	Christmas tree	
	Scientific Name	<i>Araucaria heterophylla</i>	
	Family	Araucariaceae	

Sl. No.	Details		Photograph
6	Name	Asparagus	
	Local Name	Sotomul	
	Scientific Name	<i>Asparagus racemosus</i>	
	Family	Asparagaceae	
7	Name	Mango	
	Local Name	Aam	
	Scientific Name	<i>Mangifera indica</i>	
	Family	Anacardiaceae	
8	Name	Thuja plant	
	Local Name	Thuja	
	Scientific Name	<i>Platycladus orientalis</i>	
	Family	Cupressaceae	
9	Name	Chandan/Indian Sandalwood	
	Local Name	Chandan Gos	
	Scientific Name	<i>Santalum album</i>	
	Family	Santalaceae	
10	Name	Neem	
	Local Name	Neem	
	Scientific Name	<i>Azadirachta indica</i>	
	Family	Meliaceae	

Sl. No.	Details		Photograph
11	Name	Guava	
	Local Name	Modhuri Aam	
	Scientific Name	<i>Psidium guajava</i>	
	Family	Myrtaceae	
12	Name	Arjun	
	Local Name	Arjun gosh	
	Scientific Name	<i>Terminalia arjuna</i>	
	Family	Combretaceae	
13	Name	Mehgoni/Mahogany	
	Local Name	Mehgony	
	Scientific Name	<i>Swietenia mahagoni</i>	
	Family	Meliaceae	
14	Name	Lemon	
	Local Name	Nemu	
	Scientific Name	<i>Citrus limon</i>	
	Family	Rutaceae	
15	Name	Asiatic pennywort	
	Local Name	Bormanimuni	
	Scientific Name	<i>Centella asiatica</i>	
	Family	Apiaceae	

Sl. No.	Details		Photograph
16	Name	Periwinkle	
	Local Name	Nayantora	
	Scientific Name	<i>Catharanthus roseus</i>	
	Family	Apocynaceae	
17	Name	Red Nongmangkha	
	Local Name	Titaphul	
	Scientific Name	<i>Thrysisiformis acanthaceae</i>	
	Family	Acanthaceae	
18	Name	Basil	
	Local Name	Tuloshi	
	Scientific Name	<i>Ocimum tenuiflorum</i>	
	Family	Lamiaceae	
19	Name	Bryophyllum	
	Local Name	Duportenga	
	Scientific Name	<i>Bryophyllum pinnatum</i>	
	Family	Crassulaceae	
20	Name	Mint	
	Local Name	Pudina	
	Scientific Name	<i>Mentha spicata</i>	
	Family	Lamiaceae	

Sl. No.	Details		Photograph
21	Name	Brahmi	
	Local Name	Brahmi	
	Scientific Name	<i>Bacopa monnieri</i>	
	Family	Scrophulariaceae	
22	Name	Maha Bhringaraj	
	Local Name	Maha Bhringaraj	
	Scientific Name	<i>Eclipta alba</i>	
	Family	Asteraceae	
23	Name	Ginger	
	Local Name	Aada	
	Scientific Name	<i>Zingiber officinale</i>	
	Family	Zingiberaceae	
24	Name	Starfruit	
	Local Name	Kordoi	
	Scientific Name	<i>Averrhoa carambola</i>	
	Family	Oxalidaceae	
25	Name	Indian gooseberry	
	Local Name	Aamlukhi	
	Scientific Name	<i>Phyllanthus emblica</i>	
	Family	Phyllanthaceae	

Sl. No.	Details		Photograph
26	Name	Turmeric	
	Local Name	Halodhi	
	Scientific Name	<i>Curcuma longa</i>	
	Family	Zingiberaceae	
27	Name	Curry leaf tree	
	Local Name	Narasingha	
	Scientific Name	<i>Murraya koenigii</i>	
	Family	Rutaceae	
28	Name	Chebulic myrabolan	
	Local Name	Hilikha	
	Scientific Name	<i>Terminalia chebula</i>	
	Family	Ombretaceae	
29	Name	Henna plant	
	Local Name	Jatuka	
	Scientific Name	<i>Lawsonia inermis</i>	
	Family	Lythraceae	
30	Name	Indian Pennywort	
	Local Name	Manimuni	
	Scientific Name	<i>Centella asiatica</i>	
	Family	Apiaceae	

Sl. No.	Details		Photograph
31	Name	Marigold	
	Local Name	Narzi Phool	
	Scientific Name	<i>Tagetes erecta</i>	
	Family	Calenuleae	
32	Name	Chameleon plant	
	Local Name	Mousundori	
	Scientific Name	<i>Houttuynia cordata</i>	
	Family	Sauraceae	
33	Name	Durva grass	
	Local Name	Duboribon	
	Scientific Name	<i>Cynodon dactylon</i>	
	Family	Cyperaceae	
34	Name	Bilwa or Bael plant	
	Local Name	Bel	
	Scientific Name	<i>Aegle marmelos</i>	
	Family	Rutaceae	
35	Name	Black Pepper	
	Local Name	Jaluk	
	Scientific Name	<i>Piper nigrum</i>	
	Family	Piperaceae	

Sl. No.	Details		Photograph
36	Name	Night queen	
	Local Name	Sewali	
	Scientific Name	<i>Nychanthes arbor-tristis</i>	
	Family	Oleaceae	
37	Name	The Bay tree	
	Local Name	Tejpat	
	Scientific Name	<i>Cinnamomum tamala</i>	
	Family	Lauraceae	
38	Name	Jute	
	Local Name	Morapat	
	Scientific Name	<i>Corchorus olitorius</i>	
	Family	Tillaceae	

12. 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. Some faunal species found in the campus as listed in Table 5.

Table 5 Faunal Diversity of College Campus

Sl. No.	Scientific Name	Common Name	Photograph
1	<i>Agriopsis leucophaearia</i>	Bisapokhila	
2	<i>Insecta isoptera</i>	Uui puk	
3	<i>Corvus splendens</i>	Crow	
4	<i>Calotes versicolor</i>	Tejpia	
5	<i>Acridotheres trestis</i>	Myna	
6	<i>Hogna aspersa</i>	Wolf spider	

Sl. No.	Scientific Name	Common Name	Photograph
7	<i>Pseudozizeeria maha</i>	Pale grass blue	
8	<i>Passer domesticus</i>	House sparrow	
9	<i>Irodomyrmese purpureus</i>	Ants	
10	<i>Musca domestica</i>	House fly	
11	<i>Neplila kuhlii</i>	Blackwood spider	
12	<i>Lumbricus terrestris</i>	Earth worm	

13. 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 college has proper solid waste disposal system. There are separate dustbins for the collection of different waste such as plastic waste, metallic waste, organic waste. The institution has vermi-compost plant for treatment of organic waste. Recyclable Wastes are sold off at regular interval for recycling. A committee has been constituted in the college to look into the execution of the waste management policy of the college. The waste management policy aims at making the campus plastic free. Therefore, the college has restricted the use of single use plastic inside the college campus.

The institution also conducts events such as cleanness drives, seminars, practical works, discussions etc. on waste management. By formulation and proper implementation of the waste management policy, the college tries to cultivate habits and skills among the trainees, students and faculty members about waste management.

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 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.

14. VEHICULAR MOVEMENTS

It was estimated that on an average around 24 four-wheelers and 15 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.

15. 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 170 kW. The electrical power consumption of NAMCE from April, 2022 to March, 2023 is shown in Table 6. This is supported by a power backup system consisting of 2 nos. of Diesel Generators as detailed in Table 7.

Table 6 Energy consumption of College campus

Month	PF (Power Factor)	Units Consumed	Billed amount (₹)
April, 2022	96.0	5339.04	59,727.73
May, 2022	97.2	5418.42	59,537.93
June, 2022	98.0	7283.73	74,329.84
July, 2022	98.5	7193.52	75,281.75
August, 2022	97.8	4880.07	58,641.67
September, 2022	98.5	7013.10	75,501.27
October, 2022	95.3	4927.44	57,182.28
November, 2022	94.5	5132.16	59,921.88
December, 2022	94.5	3011.58	42,058.07
January, 2023	87.3	3082.86	43,264.85
February, 2023	88.9	4116.42	50,372.45
March, 2023	95.3	4906.86	52,496.97

Table 7 Details of diesel generators

Make of the Generator	Rating (kVA)	Annual fuel consumption (2022-2023)		Generator annual maintenance done/not done
		Amount (l)	Cost (₹)	
Kirloskar Oil Engines Limited Model: KG1-82.5 WS1	82.5	7000	5,67,420.00	Yes
Kirloskar Oil Engines Limited Model: KG1-62.5 WS	62.5			Yes

Keeping in view of the available rooftop area, it is suggested that the College Authority may install renewable energy generation systems to substitute a sizeable fraction of their electricity requirement, which in turn will be another green and environmentally benign practice of the institute.

16. 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.

1. *Plastic free campus:* The use of plastic is restricted and discouraged in the college campus (Fig. 5). The use of paper in daily functioning of the college office is limited by gradually moving towards a paperless mode.

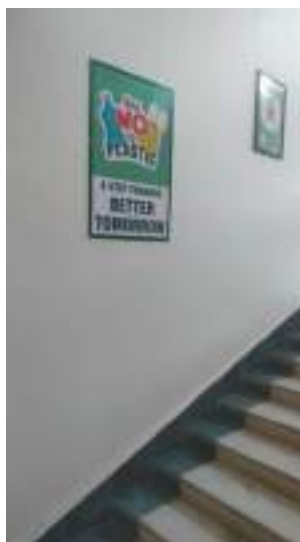


Fig. 5 Signage discouraging the use of plastic in the campus

2. *Adopt a tree initiative:* The institution has adopted an initiative known as “Adopt a Tree” to inculcate green practices among students as well as in society. The college has collected different medicinal plants available in this locality with the help of students. The initiative attempts to protect, preserve the valuable plants and

create awareness about their medicinal benefits. Through this initiative the college is encouraging the practice of local knowledge-sharing and working towards the optimization of local resources.

3. *Programmes related to environment awareness:* Seminars/workshops are regularly organized by the college for various stakeholders to create awareness regarding environmental sustainability (Fig. 6).

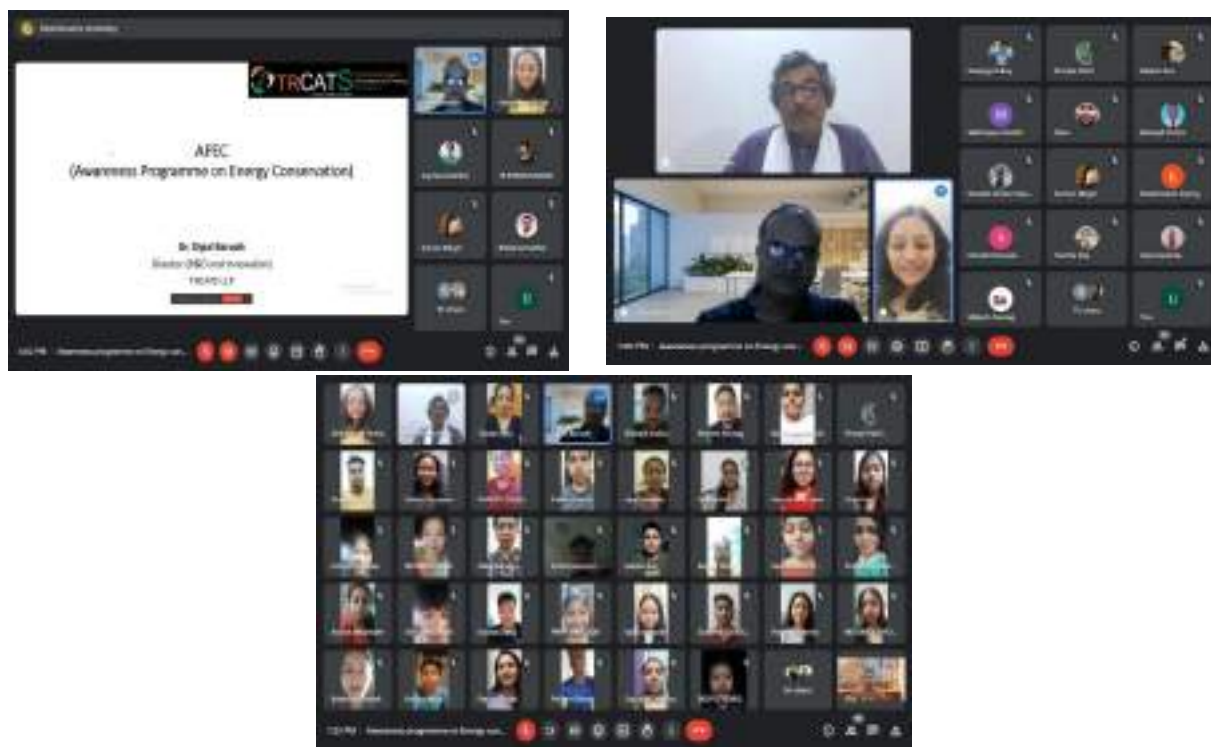


Fig. 6: Moments from the awareness program on energy conservation, 4th February, 2023

4. *Extension Activities conducted on Environment Awareness:* Various outreach activities relating to environment are carried out by the college. Some highlights of such activities are detailed below (Fig. 7).



Fig. 7 Moments from the green initiative campaign, 6th February, 2023

17.RECOMMENDATIONS

Green Audit of Nazir Ajmal Memorial College of Education was conducted. The study comprised 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.