GREEN AUDIT REPORT

2022-23

SONTALI ANCHALIK COLLEGE, MAHTOLI
KAMRUP, ASSAM

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AKNOWLEDGEMENT

Sontali Anchalik College, Mahtoli has created an ecologically sound campus by implementing some eco-friendly practices. The present report is the recent Green Audit Report of the College which looked forward to identify the environment related issues in the College campus and to monitor the environmental management practices adopted by the College. A few suggestions are also made to take environmental protection to higher levels in the College campus and its vicinity. It is hoped that there port will certainly receive due attention of the concerned authority and the College shall implement the green practices whatever suggested for better future of all stakeholders of the Sontali Anchalik College, Mahtoli.

We, the Green Audit Assessment Team expresses our gratitude to Dr. Tapan Dutta, Principal in-charge, Dr. Mobarok Ahmed, Vice-Principal and Mr. Nurul Islam, IQAC Coordinator at Sontali Anchalik College for providing us the necessary green audit related data and leading our team with their valuable suggestions while compiling the report. We are also grateful to the entire teaching and non-teaching staff of the college for their kind cooperation during the data collection process. Lastly, we thank everyone who helped us directly or indirectly in finalizing the Report.

Dr. Habibur Rahman
&
Dr. Dhiraj Kr. Das
Auditors
Sontali Anchalik College, Mahtoli, Kamrup, Assam
Green Audit - 2022-23
&
Associate Professors, J. N. College, Boko, Kamrup, Assam

ABOUT SONTALI ANCHALIK COLLEGE

Sontali Anchalik College, Mahtoli, Kamrup was established on 31st August 1987 to cater the need of Higher Education in the South-West, Kamrup region of Assam. The college is situated at a distance of 80 kms west of Guwahati City of Assam and on the southern Bank of the River Brahmaputra. The College is well connected by bus from Guwahati city and by machine boat from inter District Barpeta of northern side of the same. The inter-state boundary between Assam and Meghalaya is just 30 Kms South of the College.

The after coming under the fold of Affiliation under Gauhati University 1993 and subsequent. The College has been under provincialized scheme of Govt. of Assam w.e.f. 1st January, 2013 with 7 full-fledged departments under the faculty of Arts stream, Sontali Anchalik College continued to add new feathers in cap so far as its academic excellence is concerned. The sustained endeavour and efforts of the college towards quality education and the focus on all round development of the economically weaker section of the society is commendable. The college has not been accredited till today by NAAC.

Around 750 students enrolled in UG programmes along with diploma and certificate course at S A College in the session 2023 against 23 faculty members including one library assistant. The principal is the chief executive of the college and the Vice-Principal who has been nominated by Governing Body (GB) from the teachers is assisting him in academic activities.

Green Audit at
Sontali Anchalik College, Mahtoli

Participating in the "Green Campus, Clean Campus" mission launched by the University Grants Commission for all higher educational institution of India and incompliance with the' Environmental Consciousness', a mandatory criterion (Criterion VII) of National Assessment and Accreditation Council (NAAC), the sustainability and sustainable development policies are kept on the agenda of Sontali Anchalik College, Mahtoli, Green Audit is one of the steps taken up by the College in order to record, document, analyses and report the environmental constituents of the Campus through an impartial and inclusive method of auditing. It is anticipated that Green Auditing shall help the College in preserving the rich floral and faunal diversity in and around the campus and creating awareness's among the stakeholders.

Sontali Anchalik College is committed to responsible stewardship of resources and to demonstrate leadership in sustainable academic practices for a better tomorrow with the policy goals of Green audit as follows:

1. Identification and Documentation of Eco-friendly Practices for a Sustainable College Campus:
    - Identify existing eco-friendly practices implemented within the college campus.
    - Document these practices systematically for reference and analysis.
    - Evaluate the effectiveness of these practices in promoting sustainability.
2. Increasing Awareness Among All Stakeholders for Sustainable Use of Available Resources:
    - Develop and implement awareness programs targeted at all stakeholders, including students, faculty, staff, and the local community.
    - Educate stakeholders about the importance of sustainable resource management.
    - Promote behaviors and practices that contribute to sustainable resource use.
3. Collection of Baseline Data on Different Components of Environment Before Converting into Threat to the College and the Society:
    - Conduct comprehensive data collection on various environmental factors within and around the college campus.

To achieve these policy goals and objectives, the Sontali Anchalik College, Mahtoli, aims to:

1. Identify Current and Emerging Environmental Issues:
    - Conduct thorough assessments to identify existing environmental issues.
    - Monitor changes and emerging trends in environmental conditions.
2. Monitor Environmental Management Practices:
    - Evaluate the effectiveness of existing environmental management practices.
3. Create Awareness Among the Various Stakeholders of the College:
    - Develop communication strategies to disseminate information about environmental issues and initiatives.

AUDIT STAGE

Green auditing is described as a process aimed at identifying and assessing whether an organization, in this case, the college, maintains eco-friendly and sustainable practices. It is recognized as an effective ecological tool that helps foster a culture of sustainability within an organization through administrative policies. This process involves regular identification, quantification, documenting, reporting, and monitoring of environmentally significant components.

In the context provided, green auditing at Sontali Anchalik College began with the formation of a Green Audit team comprising faculty members from both J N College, Boko, and Sontali Anchalik College. This interdisciplinary team visited the campus regularly to monitor various facilities from an auditing perspective. They assessed the status of the green cover of the institution, waste management practices, energy conservation strategies, and other relevant factors.

Data collection for the green audit was conducted through on-site visits and structured questionnaires covering different sectors such as water, energy, waste and biodiversity status. The collected data were then analyzed to prepare the Green Audit report of Sontali Anchalik College, Mahtoli. The Green Audit team was led by Dr. Habibur Rahman, Head of Department and Associate Professor, along with Dr. Dhiraj Kr. Das, Associate Professor from the Department of Botany and Mathematics respectively at J. N. College, Boko, Kamrup, Assam. Their leadership and expertise guided the auditing process to ensure a comprehensive assessment of the college's environmental practices.

METHODOLOGY ADOPTED:

The methodology adopted to conduct the Green Audit of Sontali Anchalik College comprised the following components:

- Onsite Field Visits by the Green Audit Team:

The Green Audit Team conducted onsite visits to the college campus as and when necessary. These visits allowed the team to observe and assess various facilities, practices, and environmental conditions directly.

- Data Collection:

Data collection was carried out through the distribution of structured questionnaires among different stakeholders, including executives, official staff, and general students. Interviews were also conducted with these stakeholders to gather additional information and insights.

- Water Quality Analysis:

Water quality analysis was conducted at the Department of Chemistry Laboratory of J. N. College, Boko. This involved testing and analyzing water samples to assess their quality and identify any potential issues related to water management and pollution.

- Biodiversity Audit:

Different standard taxonomic and ecological protocols were followed to document and estimate the floral and faunal diversity within and around the college campus. This likely involved methods such as species identification, population assessments, and habitat evaluations to provide a comprehensive overview of biodiversity.

By incorporating these components into the methodology, the Green Audit team was able to gather diverse and comprehensive data on various aspects of environmental sustainability within Sontali Anchalik College. This data served as the basis for evaluating the college's eco-friendly practices and identifying areas for improvement.

POST AUDIT STAGE

Land use and land cover

Located within a thinly populated out skirt, of Mahtoli (Sontali) market, the college campus is a flat piece of land having the little undulation in the topography. The present survey revealed that the college campus has been accommodated in a total area about 16.71 acres of land managed with a master plan having a botanical garden and an ornamental flower garden.

Observations:

- Eco-friendly life skill initiatives like training on Kaushal Vikash for gardening, exposure to life cultivation of Potato, Jute and Paddy are commendable green initiatives of the college.
- Avenue trees including sound barriers lack attention.
- The drainage links are suitably managed to harvest the rain water towards a well inside campus with a view to save ground water.
- Disturbance is less dedicated green areas/ gardens.

Table 1: LAND USE ANALYSIS

FID Shape	Id	Name	Area (in Acores)
0 Polygon	0	Open Space	4.20619
1 Polygon	0	Football & Cricket Play Ground	1.76680
2 Polygon	0	College Garden	0.11416
3 Polygon	0	Book Stall	.00691
4 Polygon	0	College Canteen	0.0156
5 Polygon	0	Library	0.0385
6 Polygon	0	Administrative Building including GU CDOE Study Centre	0.03854
7 Polygon	0	Pond	1.401
8 Polygon	0	Women Hostel Building	0.08426
9 Polygon	0	Girls Hostel	0.0801
10 Polygon	0	Conference Hall	0.0356
11 Polygon	0	Computer Lab	0.0178
12 Polygon	0	Staff Toilet (Male & Female)	0.00445
13 Polygon	0	Kitchen Room	0.00395
14 Polygon	0	Health Unit Office	0.00556
15 Polygon	0	Girls Common Room (Including Toilet)	0.0128
16 Polygon	0	Boys Common Room	0.0267
17 Polygon	0	College Yoga Centre	0.0111
18 Polygon	0	Dept. of (Ara & Eco)	0.0178
19 Polygon	0	Dept. of (His & Eng)	0.0326
20 Polygon	0	Dept. of Education	0.0313
21 Polygon	0	Dept. of Assamese	0.0169
22 Polygon	0	Digital Library	0.0385
23 Polygon	0	Volley Ball Play Ground	0.222
24 Polygon	0	Badminton Play Ground	0.0214
25 Polygon	0	Kabaddi Play Ground	0.257
26 Polygon	0	Flag Ground	0.0629
27 Polygon	0	Office of the Student Union including toilet	0.00593
28 Polygon	0	IQAC Room	0.0208
29 Polygon	0	Political Science	0.109

WATER AUDIT

Water audit is a vital process for assessing the quality and usage of water within a campus or any other environment. It involves studying the balance between water demand and supply, as well as the quality of available water resources. Water auditing serves as an effective management tool for minimizing losses, optimizing various water uses, and ultimately conserving water resources.

Key aspects of water auditing include:

Balance between Demand and Supply: Water auditing examines the balance between the demand for water within the campus and the available supply. This includes assessing the quantity of potable and usable water required for various purposes such as drinking, sanitation, irrigation, and other campus activities.

Quality of Available Water:

Water auditing also evaluates the quality of the water sources available within the campus. This includes assessing parameters such as pH levels, dissolved solids, microbial contamination, and other factors that affect water quality and suitability for different uses.

Minimizing Losses:

Water auditing helps identify and address issues such as seepage, leakage, and inefficient water distribution systems that contribute to water losses within the campus. By addressing these issues, water losses can be minimized, leading to more efficient water management.

Recycling and Rainwater Harvesting:

Water auditing generates ideas for possible water recycling initiatives and the utilization of rainwater. These strategies help maximize the use of available water resources and reduce reliance on external water sources.

Water Management:

The source of water used in the college is ground water, a total of 3000 L water is pumped out through water pumps everyday (Table-2) for regular use in daily college activities, gardening along with the canteen uses (amount could not be estimated) and laboratory uses.

Table 2: Source and usage

Sl.No.	Parameters	Response
1	Source of water	Ground water
2	Number of wells	Nil.
3	Number of hand pumps	04
4	Number of overhead tank	05
5	Number of Water filters used	03
6	Horse power water pump	1 HP, 1 HP, 1HP
7	Depth of well(boring)	105ft, 120ft, 150ft
8	Water level	Ground water
9	Type of water tanks	1 concrete, three plastic
10	Capacity of water tank	1000 L, (X 5)
11	Quantity of water pumped	04
12	Indication of water wastes	Toilets, hand pumps, motor pumps.
13	Water usage for gardening every day.	500 Lt.
14	Leaning of the reservoirs	Yes

WATER QUALITY ASSESSMENT:

Water samples were collected randomly from the sources and analyzed for various physico- chemical parameters (Table-3). All parameters excluding iron were found under permissible limits as prescribed by different agencies.

Table-3: Water Quality Analysis Report

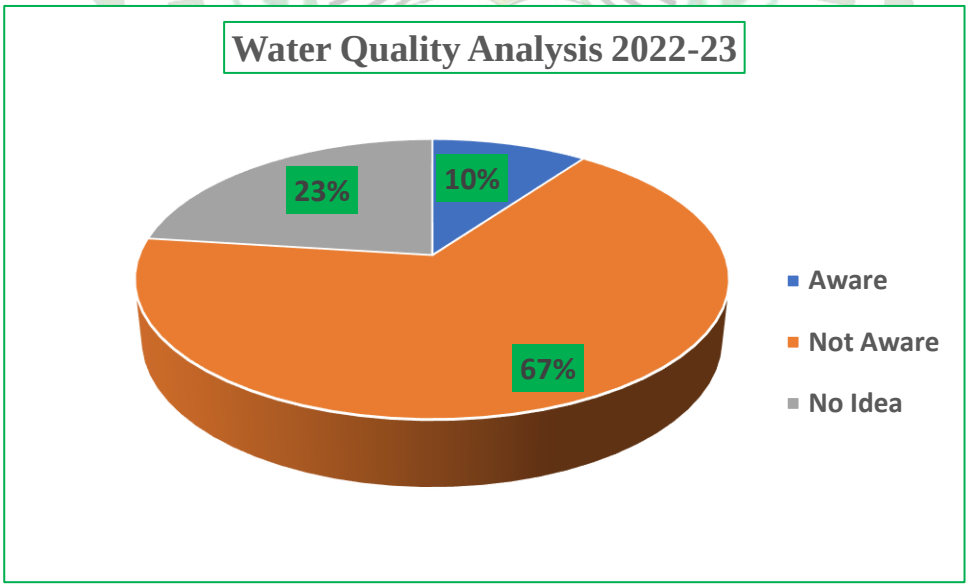
Sl. No.	Parameters	Values
1	PH	6.59-6.7
2	Total hardness (mg/1)	58-67
3	Alkalinity (mg/1)	70-83
4	Turbidity (N.T.U.)	1.85/1.92

5	Calcium hardness (mg/1)	64-80
6	Total dissolved solids (mg/1)	26-58
7	Sulphates (mg/1)	6.59
8	Chloride (mg/1)	29.5
9	Fluoride(mg/1)	Not traced
10	Phosphate(mg/1)	0.51-0.563
11	Iron (mg/1)	1.10-1.57
12	Nitrate (mg/1)	Nil
13	Arsenic (mg/1)	Nil
	Calcium (mg/1)	42.05
14	Manganese (mg/1)	0.14-0.116
15	Magnesium (mg/1)	18-22.76
16	Bacteriological count	Nil

Table: Water Quality Analysis

Aware	10%
Not Aware	67%
No Idea	23%

Figure: 1



Observations:

- The college emphasizes the judicious use of water resources.
- Awareness of water conservation is relatively high among stakeholders.
- Attention is needed to address areas of little wastage of water.
- Display signage for water conservation and regular monitoring are properly maintained and monitored.

- The management of wastewater from canteens and kitchens needs improvement.
- It is not only a unique step but also commendable practice of the S. A. College, Mahtoli, for water conservation in vicinity of campus.

Suggestions and Recommendations:

- Implement a proper water consumption monitoring system to minimize water loss.
- Construct rainwater harvesting systems for each building.
- Automated sensors can be installed in order to prevent the overflow of water from tanks.
- Conduct awareness campaigns for new students to promote water-saving practices.
- Perform periodic maintenance of water taps, pipes, and reservoirs to prevent water leakage.

AUDITING FOR WATSE MANAGEMENT

Any activities in an establishment create waste and the prime question is how efficiently it could be handled to avoid any kind of health problems out of it. Pollution from waste is aesthetically uncleansing and results in generations of large number of litters in our surroundings. A college can generate 3 types of waste viz- solid waste, liquid waste and hazardous waste. Solid waste again can be divided into 3 categories- bio-degradable, non-bio-degradable and hazardous waste.

Bio-degradable waste can be effectively utilised for energy generation purposes through anaerobic digestion or can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-bio-degradable waste can be utilised through recycling and re-use. Further attention should be initiated against hazardous waste that is likely to be a threat to health of the environment. As unscientific management of these wastes such as dumping in pits or burning them may be caused harmful discharge of contaminants in to soil and water, and produce Green House gases contributing to global climate change respectively, management of waste is utmost necessary.

The auditor diagnoses the prevailing waste disposal policies of the college and suggests the best way to combat the problems.

Status of waste generation:

Based on the provided information, waste generation within the premises of S. A. College, Mahtoli is primarily categorized into paper, plastic, organic, bio-medical, and e-waste (Table-4). Here is a summary of the estimated monthly waste generation in different categories:

- Administrative Blocks and Canteen:

  Paper and plastic wastes were recorded to be generated in the Administrative Blocks and Canteen areas. Organic waste was found to be more prevalent in the Canteen premises and cultivation sites.

- Academic Departments:

  Waste generation in academic departments was negligible. Whatever waste was generated in academic departments was systematically disposed of through the sweeping mechanism.

- Faculty Involvement:

  Faculty members were actively engaged in segregating and disposing of waste.

- Composting:

  Litters, including regularly fallen twigs and leaves from plants and trees, were found to be dumped in a compost pit.

- Bio-medical and E-waste:

  Bio-medical waste and e-waste were almost negligible during the survey period.

It's evident that the college has a relatively organized waste management system in place, with faculty involvement and systematic disposal methods. The composting of organic waste demonstrates a sustainable approach to waste management by utilizing natural processes for decomposition. Additionally, the

minimal generation of bio-medical and e-waste suggests effective measures in place to reduce hazardous waste streams.

Table-4: Waste generated in the campus (per month)

Sl. No.	Stakeholders	Types of solid waste	Average waste generated/month
1	Academic department	Paper waste Plastic waste Organic waste E-waste Bio-medical waste	0.8kg 0.2kg 1.2kg 0.25kg Nil
2	Administrative office	Paper waste Plastic waste Organic waste E-waste Bio-medical waste	10kg 0.8kg 2.5kg 0.58kg Nil
3	Hostels	Paper waste Plastic waste Organic waste E-waste Bio-medical waste	Nil Nil Nil Nil Nil
4	Canteen	Paper waste Plastic waste Organic waste E-waste Bio-medical waste	1.2kg 1.2kg 20kg Nil Nil

The college has taken significant steps towards waste management with a commitment to maintaining a clean and green campus. Segregation practices have been adopted to separate different types of wastes, and the installation of dustbins has begun in a phased manner across the premises. Signage has also been installed to raise awareness among stakeholders about the proper use of different-colored dustbins for waste disposal. This proactive approach to waste management is commendable and reflects the college's dedication to environmental sustainability.

During a survey conducted among stakeholders of S. A. College, Mahtoli, by the Green Audit Team, a majority of respondents (80%) expressed confidence in their understanding of waste management practices and their responsibility to properly dispose of waste. This indicates a positive attitude towards waste management and a willingness among stakeholders to actively contribute to keeping the campus clean and environmentally friendly.

Overall, the college efforts in waste management, including segregation practices, dustbin installation, and stakeholder awareness initiatives, demonstrate a proactive approach to environmental sustainability and reflect a commitment to maintaining a clean and green campus environment.

Table-5: Waste management practices was adopted --

Sl. No.	Practice strategies	Response	Quantification If any
1	Organised collection of organic waste	Yes	NA
2	Leaf Litter disposal	--	--
3	Vermicomposting unit	2	NA
4	Use of Plastic /plastic wares	In use	little
5	Segregation of waste as per Govt. directives	Yes	NA
6	Dustbins clearing	Yes	On daily basis
7	Dustbins proper places	Yes	Not sufficient
8	Solid waste recycling process	No	NA
9	Awareness programmes organised	Yes	Regular

Based on the provided table, the waste management practices and strategies adopted by S. A. College, Mahtoli are as follows:

- Organized Collection of Organic Waste: The College has organized the collection of organic waste, indicating a proactive approach to managing biodegradable waste materials.
- Leaf Litter Disposal: The College disposes of leaf litter, ensuring proper management of organic waste from fallen twigs and leaves.

- Vermicomposting Unit: A vermicomposting unit is in place, allowing for the composting of organic waste with the use of earthworms to facilitate decomposition.
- Use of Plastic/Plastic Wares: Plastic or plastic wares are in use within the college premises, though further quantification of usage is not provided.
- Segregation of Waste as per Government Directives: Waste segregation is practiced in accordance with government directives, emphasizing compliance with waste management regulations.
- Placement of Dustbins: A total of 40 dustbins have been placed in proper locations across the campus, facilitating waste disposal and segregation.
- Dustbin Clearing: Dustbins are regularly cleared, ensuring proper waste management and maintaining cleanliness within the campus environment.
- Solid Waste Recycling Process: While the table indicates that a solid waste recycling process is not currently in place, it could be an area for potential improvement in the college's waste management practices.
- Awareness Programme Organized: The College has organized awareness programs related to waste management, contributing to educating stakeholders about proper waste disposal practices.

Overall, these practices demonstrate the college's efforts to adopt various waste management strategies, including collection, segregation, disposal, and awareness programs, contributing to a cleaner and more sustainable campus environment.

Awareness among the stakeholders regarding water conservation observations:

- The College is concerned with judicious use of water.
- The College has taken one initiative in ground water recharges by dictating all roof top waters through the drains to a well to be stored and allowed to seepage towards ground water level.
- It is not only a unique step but also commendable practice of the S. A. College, Mahtoli, Kamrup for water conservation in vicinity of campus.

HEALTH AUDIT

A healthy ecosystem directly means to healthy livelihood. Hence, to ascertain healthy society inside the college campus and to create awareness among the individuals in taking actions against the growing strain on Earth's natural ecosystem, the S. A. College, Mahtoli, fraternity took few initiatives through several events in past couple of year.

Activities of Eco-Club:

Activities of Eco Club		
Sl. No.	**Date**	**Programme celebrated.**
1	04-02-2018	Observation of World Cancer Day.
2	31-05-2019	Observation of International Tobacco Day.
3	14-11-2021	World's Diabetes Day and awareness camp on diabetes detection campaign.
4	01-12-2022	Observation of World's Aids Day and prevention of Aids.
5	05-06-2022	World's Environment Day (Popular talk on "Lets live with nature")
6	05-07-2022	Plantation derives in the College campus on 15th July 2022 as a part of Van Mahotsav.
7	15-07- 2022	Plantation drives from 15th July to 15th August under the scheme of Chief Minister's Institutional Plantation Programme (CMPP).
8	31-05-2023	Observation of World's Tobacco Day.

NSS Unit Activities:

Sl. No.	Date	Programmes held
1	05-06-2018	Celebration of World's Environment Day
2	02-10-2018	Swachh Bharat Abhiyan
3	05-06-2019	Awareness programme on cleanliness and celebration of World's environment Day
4	02-10-2021	Swachh Bharat Abhiyan Cleanliness Programme
5	24-10-2021	One Day orientation programme for NSS Volunteers
6	05-06-2022	Celebration of World's Environment Day
7	06-06-2022	An Awareness programme on Nisa Mukta Bharat Abhiyan
8	21-06-2022	Celebration of International Yoga Day
9	05-12-2022	Cleanliness drive programme in our college campus
10	10-12-2022	Human Rights Day celebration
11	28-12-2022	An Awareness programme on Environment cleanliness
12	25-02-2023	A cleaning programme is held in our college campus
13	05-06-2023	Celebration of World Environment Day
14	26-01-2023	Celebration of 74th Republic Day
15	22-03-2023	Celebration of water Day
16	30-03-23	Celebration of an International Zero waste Day
17	08-03-2023	Workshop on world Women's Day

Photographs of different Activities of the College under NSS & Eco Club

1. **NSS Programme on an awareness campaign on Single use plastic and it impact on the environment -26-06-2023, conducting jointly NSS unit & Students of nearest adopted schools.**


AN AWARNESS CAMPAIGN
ON
SINGLE-USE PLASTICS AND ITS IMPACT ON
THE ENVIRONMENT
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India
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Long 91.138326°
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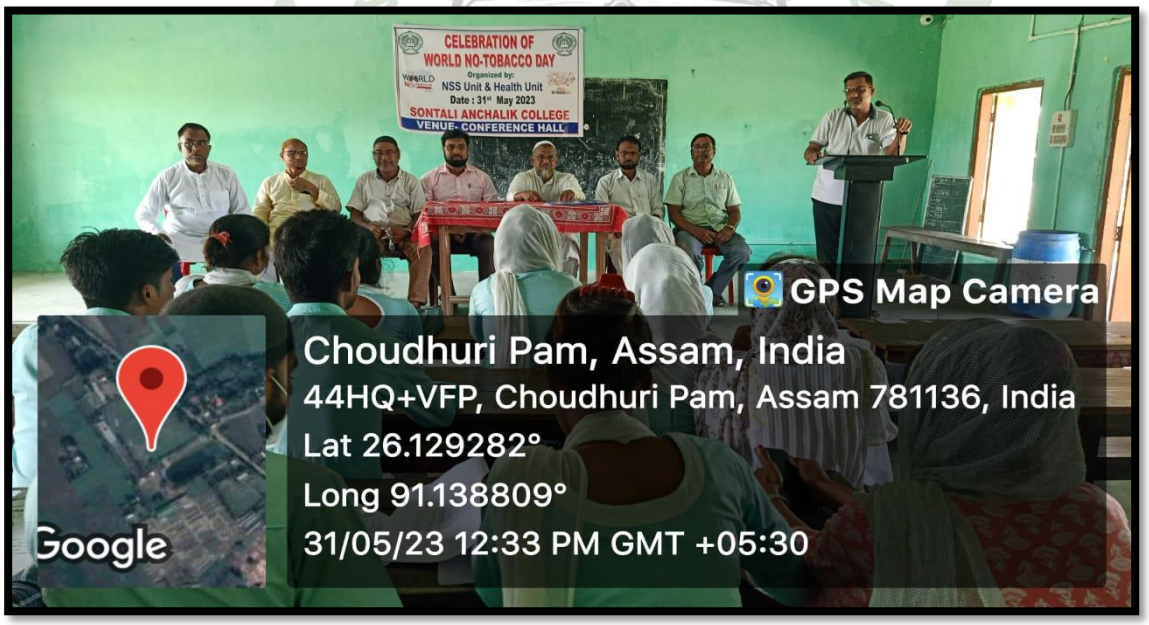
Google

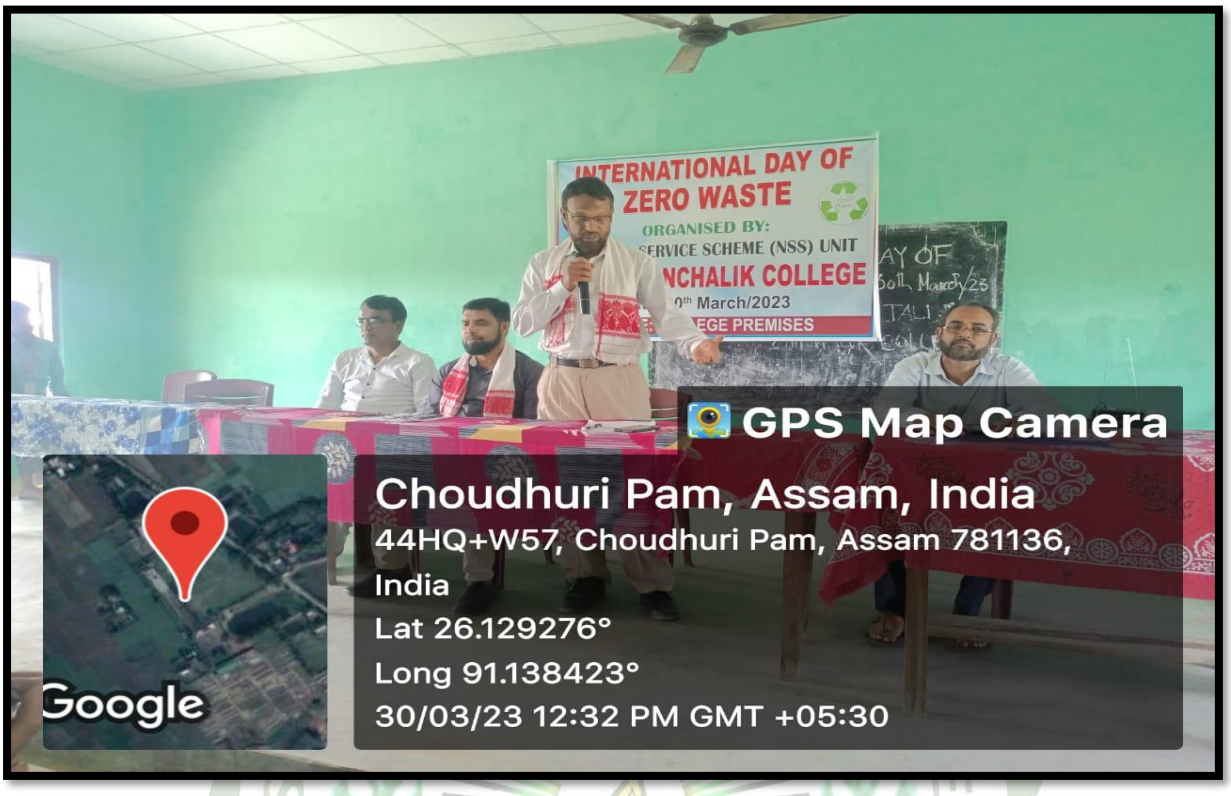

AN AWARNESS CAMPAIGN
ON
SINGLE-USE PLASTICS AND ITS IMPACT ON
THE ENVIRONMENT
GPS Map Camera
Choudhuri Pam, Assam, India
44HQ+W57, Choudhuri Pam, Assam 781136,
India
Lat 26.12896°
Long 91.138326°
26/06/23 10:57 AM GMT +05:30
Google

2. **World Environment Day 5th June, 2023**.

3. World No Tobacco Day-31-05-2023.



4. **International Day of Zero Waste-30-03-2023**.


INTERNATIONAL DAY OF
ZERO WASTE
ORGANISED BY:
SERVICE SCHEME (NSS) UNIT
NCHALIK COLLEGE
0th March/2023
EGE PREMISES
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5. **World Water Day Celebration- 22-03-2023, Organized by Amar Prayas Gosthi in Collaboration with IQAC Sontali Anchalik College.**

6. Cleaning Programme, College Campus- 25-02-2023

7. World Cancer Day 04-02-2023.

8. Awareness on Environment and Hygiene- 28-12-2022, cleaning of college campus.

9. Cleanliness Drive program at college campus -05-12-2022

10. Plantation Programme on the occasion of 400th Birth Anniversary of Lachit Barphukan-20-11-2022.

11. Azadi ka Amrit Mahatsav- 13 to 15-08-2022

12. Nisa Mukta Bharat Abhiyan 06-06-2022.

13. World Environment Day-05-06-2022

14. World Earth Day on 22nd april-2022.

15. Swachha Bharat Abhiyan 02-10-2021.

2020-2021

1. **Celebration of world Environment day and plantation program-05-06-2021.**

2. Swachha Bharat Abhiyan 02-10-2019.

3. Celebration of World Environment Day & Plantation Programme-05-06-2019

4. World No Tobacco Day-31-05-2019.

5. **Celebration of World Environment Day & Plantation Programme-05-06-2019**

6. **Swachha Bharat Abhiyan 02-10-2018**.

ENERGY AUDIT

As per energy conservation Act 2001, the Energy Audit must includible verification, monitoring analysis of the use of energy including submission of a technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption. The scope of the energy audit includes the collection of all relevant datas, documents, electricity bills, log books relating to electricity use & operations etc, inspection of the buildings & installations and then, to analyse the data to evaluate and assess energy use and also suggested measures to reduce energy use and improvement of performance. The present audit therefore aimed to cover the aggregate consumption of electrical and natural gas energy in Sontali Anchalik College, Mahtoli, Kamrup covering all Academic and Administrative Blocks and Hostels. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Source and consumption of Energy:

In Sontali Anchalik College, Mahtoli, Kamrup energy is mainly used to manage and run the (i) Lighting's load (ii) Laboratory equipment's (iii) Office equipment's (iv) Fan (v) Water pumps and (vi) Cleaning and construction of gadgets.

The primary source of the energy for college received electricity from Assam power Distribution Company limited supplied through a 35 KV connected load under the consumer No……027000018588, under the LT category. LPG is utilized in Canteen, Laboratories and Hostels only. The college has ten numbers of Solar Street light to eliminate the campus which substantially reduce the annual electricity bill.

Table 6: - Energy consumption in Sontali Anchalik College, Mahtoli, Kamrup.

Annual electrical Energy consumption: 2022-23	
LPG requirement per year	6 nos.
Fuel (Diesel)	Nil
Fuel (Petrol)	Per Year 120 Lt. (Average)10 Lt/month
Water Pump	04, 1HP
No. of energy efficient AC	02
Refrigerator	Nil
Xerox Machine	01
Water Filter	05

Inverter	04
Online UPS	01
Fans	80
Computer Printer	06

Percentage replacement of non-energy	
Efficient machines in last two years	0%
Number of LED installation at present	76
Percentage of increase of LED installation in last two years	100%
Building energy performance index	Nil

Energy Efficiency Assessment:

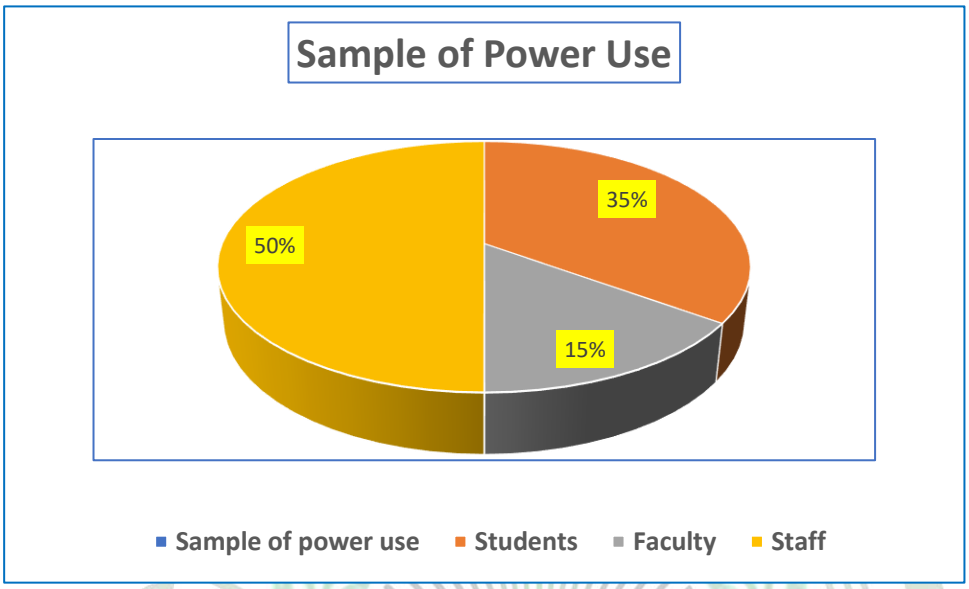
The energy efficiency assessment was conducted for the load connected to supply mainly to the College Buildings and Hostels. The entire campus including common facilities are equipped with LED Lamps and LED Tube lights all computers are set to Automatic power saving mode when not in use.

A good habit of the stakeholders observed that all the electrical appliances including the bulbs are usually shutdown, when not in use, more specifically during the vacations excluding a few essential points which are essential to illuminate the campus. Monitoring mechanism exits in put-on and put-off the electrical appliances are loadable eco-friendly effort of the college.

To compensate for the rising power requirement, solar street panels are installed in some strategic locations of the campus which could be considered as another best practice of utilisation green energy in the college campus. As the energy consumption rate is on high, the college must think for energy conservation practices along with exploring of green energy in future.

Figure- Percentage of power use by the Stakholder

Sample of power use	
Students	35%
Faculty	15%
Staff	50%



Suggestions and recommendations:

- More augmentation of solar power will make the college self-sufficient in energy consumption and production.
- Old and non-efficient electrical gadgets are to be replaced as per as practicable.
- 5 star rated AC, fans and other electrical appliances should be used in the campus to reduce further loss of energy.
- Cleaning of the fans and bulbs to be done periodically to remove the dust over it.
- Regular maintenance of electrical gadgets be done.

ENVIRONMENTAL QUALITY ANALYSIS:

Climate:

The campus enjoys a moderate the subtropical climate all through the year, with warm summers and mild winters. Spring (March-April) and Autumn (September-October) are usually pleasant with moderate rainfall and temperatures. The ambient temperature varies from 14^0C in January to 37^0C in August.

Air Quality	
O_3	14.8 ppb
NO	1.78 ppb
NO_2	2.64 ppb
PM 2.5	14.6 ì g/m3
PM 10	25.3 ì g/m3
CO	201 ppb
SO_2	2.96ppb

Wind Speed	5.25m/s
Wind Direction	West North Direction
Humidity	70.75%
Barometric Pressure	1002.89hPa

Noise Level (peak time average)				
Location	Periods (Duration in Sec.)	Minimum (dBA)	Maximum (dBA)	Average (dBA)
Administrative Block	60	25.9	57.8	51.1
Library	60	7.17	21.37	16.38
Canteen	60	24.6	63.9	53.9
College gate	60	58.75	82.7	76.2
Arts Block	60	51.7	66.8	64.3
College Side	60	4.25	16.4	14.7
Girls Common Room	60	33.45	61.9	53.28

BIODIVERSITY AUDIT

Biodiversity is the key to healthy eco-system. Morton & Hill (2014) in a biodiversity book published by the "Common wealth Scientific and Industrial Research Organisation (CSIRO)" nicely mentioned five crore values of biodiversity, viz- economic, ecological recreation, cultural and scientific values. Biodiversity provides human the raw materials for consumptions and production. Ecologically biodiversity takes part in functioning of ecosystems that supply oxygen, clear air and water, felicitating pollination in planets, control of paste, waste water treatment and many ecosystem services. Scientific intervention may disclose a wealth of systematic ecological data that helps us to understand the natural activities and necessities in the context of human behaviour. Many recreational pursuits rely on the biodiversity of the region, such as bird watching, hiking and fishing. The tourism industry also depends on bio-diversity. Above all, our culture is closely connected to bio-diversity through the expression of identity, through spirituality and through aesthetic appreciation. Any loss or deterioration in the condition of bio-diversity can compromise all the values outlined above and affected human well-being particularly in North eastern region.

As the Biodiversity plays a key role in providing numerous irreplaceable services to any community, biodiversity audit is one of the best practices for sustainability of an institute. The main objective of biodiversity audit is therefore to document different biodiversity components within the College campus, to observe ecosystem structures and functions along with regular monitoring to check the new addition and analysis of biotic interactions amongst different

components of biotic resources. The outcome of such audit will certainly be helpful in designing different conservation measures that need to be taken for a better and self-sustaining ecosystem in the campus.

The Sontali Anchalik College campus is spreading over a plot of 16.71 acres (as per record) out of which around 15% area are under green coverage with different varieties of natural fauna and flora. AQ few plants are introduced to enhance the aesthetic beauty of the campus.

FLORAL DIVERSITY:

The College campus is an ever-green beautiful area with a variety of trees, grasses and bushes. The aesthetic beauty of the campus has been enhanced by introducing a few ornamentals and economically important plants. All the plants are providing good ecological services in maintaining a green college campus near the Sontali Market (Mahtoli). All together forty-nine (49) species of plants belonging to herb, shrub and tree categories are recorded and enlisted below-

Table-7 Plants in Sontali Anchalik College Campus:

Sl. No.	Common Name	Scientific Name
01	Cadamba	*Neolamarckia cadamba*
02	Ber Tree	*Ziziphus mauritiana*
03	Ashoka Tree	*Saraca asoca*
04	Australian Pine Tree	*Casuarina equisetifolia*
05	Arjun tree	*Terminalia arjuna*
06	Palm plant	*Phoenix sylvestries*
07	Mahogany Tree	*Swietenia macrophylla*
08	Royal Poinciana plant	*Delonix regia*
09	Madhu Kamini plant	*Murraya paniculata*
10	Indian ash tree	*Lannea coromandelica*
11	Mahaneem tree	*Azadirecta indica*
12	Bakul Tree	*Mimsops elengi*
13	Pamelo tree	*Citrus maxima*
14	Ahot Tree	*Ficus religiosa*
15	Beech wood Tree	*Gemelina arborea*
16	Jack fruit Tree	*Artocarpus heterophyllis*
17	Silver Oak Tree	*Grevillea robusta*
18	Guanche Tree	*Tinospura cordifolia*
19	Poma Tree	*Chukarasia tabularis*
20	Guava tree	*Psidium guajava*
21	Eucalyptus Tree	*Eucalyptus globulus*

22	Litchi tree	*Litchi chinensis*
23	Golden shower tree	*Cassia fistula*
24	Amla Tree	*Phyllanthus emblica*
25	Mosombi Tree	*Citrus limetta*
26	Olive Tree	*Olea europaea*
27	Hibiscus flower plant	*Hibiscus rosa-sinensis*
28	Banana Tree	*Musa acuminata*
29	Rose Plant	*Rosa rubiginosa*
30	Rubber Plant	*Ficus elastica*
31	Anantamul	*Tylophora indica*
32	Euphorbia Milie	*Euphorbia milii*
33	Date Palm	*Phoenix dactylifera*
34	Curry Tree	*Murraya koenigii*
35	Chitranala Tree	*Cymbopogon nardus*
36	Nolina Plant	*Beaucarnea recurvata*
37	Tita Chapa Tree	*Michella baillonii*
38	Jamun Plant	*Syzygium cumini*
39	Passion fruit	*Passiflora edulis*
40	Thuja tree	*Thuja occidentalis*
41	Bombax	*Bombax ceiba*
42	Lozzaboti	*Mimosa pudica*
43	Mango tree	*Mangifera indica*
44	China doll plant	*Radermachera sinica*
45	Rain tree	*Samanea saman*
46	Rose apple tree	*Syzygium jambos*
47	Teak Plant	*Tectona grandis*
48	Coconut Tree	*Cocos nucifera*
49	Rock Trumpet	*Mandevilla sanderi*

Observations:

- The College maintains a sound green environment. It is commendable.
- The trees and bushes are providing nesting support to some specific indigenous wild life. It is a specific sign of calm and quite eco-friendly environment of the college campus.
- Beautiful and well-maintained gardens enhanced the aesthetic beauty of the college campus.
- The college is imparting training on life skills (Kaushal Vikash) on cultivation for marketing of potato, Peddy, Jute etc. It is obviously, a commendable green and environment friendly imitative of the college to nurture the nature.

FAUNAL DIVERSITY:

The Sontali Anchalik College campus has a good number of animals from each different species which on the other hand indicates a good health of the campus. In the present study, 53 number of vertebrates were reported in the college campus belonging to different phylum and classes. All together 9 amphibian, 8 reptile species and 31 birds were recorded during the audit period. Mammalian diversity is poor and is represented by only 5 species. Invertebrates includes several species of butterflies, grasshoppers, earth-worms. Many species of other insects like bees, wasps, ants, bugs, beetles, spiders, etc.

Amphibia

Sl. No.	Common Name	Scientific Name
1	Common tree frog	*Polypedates leucomystax*
2	Long-tongued frog	*Hylarana leptoglossa*
3	Bhamo frog	*Humerana humeratlis*
4	Yellow striped frog	*Hylarana tytleri*
5	India Bull frog	*Hoplo batrachus tigerinus*
6	Cricket frog	*Fejervarya pierrei*
7	Litter frog	*Letobrachium smithi*
8	Common Asian Toad	*Duttaphrynus melanostictus*
9	Six-lined tree frog	*Polypedates teraiensis*

Reptiles

Sl. No.	Common Name	Scientific Name
1	Striped Keel back	*Amphiesma stolatum*
2	Painted Bronze back	*Dendrelaphis pictus*
3	Red-Necked Keelback	*Rhabdophis subminiatus*
4	Checkered keelback water snake	*Xenochrophis piscator*
5	Many lined grass skink	*Europe's multifasciata*
6	Asian House Gecko	*Hemidactylus fremitus*
7	Tokay Gecko	*Gekko gecko*
8	Garden lizard	*Calottes versicolor*

Name of the Birds

Sl. No.	Common Name	Scientific Name
1	Koel	*Eudynamys scolopaceus*
2	Eagle	*Accipitridae*
3	Duck	*Anas platyrhyncos*
4	Water Cock	*Gallicrex cinerea*
5	King fisher	*Alced atthis*

6	Parrot	*Psitta eupatria*
7	Sparrow	*Passer domesticus indicus*
8	Mainah	*Acridotheres tristis*
9	Owl	*Strigiformes*
10	Rook	*Corvus frugilegus*
11	Egret	*Egretta garzetta*
12	Vulturte	*Gyps indicus*
13	Bat	*Chiropter sp.*
14	Spotted Owlet	*Alhene brama*
15	Rose-Ringed parakeet	*Psittacula krameri*
16	Red breasted flycatcher	*Ficedula prava*
17	Bank Mynah	*Acridotheres ginginianus*
18	Cattle Egret	*Bubulcus ibis*
19	House Sparrow	*Passer domesticus*
20	Common Tailor bird	*Orthotomus sutorius*
21	Baya weaver	*Ploceus-philippinus*
22	White-Breasted waterhen	*Amauronis phoenicurus*
23	Oriental Magple Robin	*Copsychus saularies*
24	House crow	*Covus splendens*
25	Little cormorant	*Microcar boniger*
26	Red-vented bulbul	*Pycnonotus cafer.*
27	Red-whiskered bulbul	*Molpastes cafer*
28	Great Egret	*Ardea alba*
29	Asian open bill stork	*Anastomus oscitans*
30	Red Colard Dove	*Streptopelia tranquebarica*
31	Barn owl	*Tyto alba*

Mammals

Sl. No.	Common Name	Scientific Name
1	House mouse	*Mus musculus*
2	Common House shrew	*Sucus murinus*
3	The common house rat	*Rattus rattus*
4	Small Indian Civet	*Viverricula indica*
5	Common mongoose	*Herpestes edwardsi*

Insects

Apis dorsata; Apis florae, Croco Themis, erythraea; Pantala Flavescens.

Moths & Butterflies

*Commander; Ethope himachala; Melanities Leda; Bombyx mori; philosamia ricini; junonia atlites; Ypthima baldus; Acraea terpsico*re.

Spiders

Myrmachne orientalis; Nephila plipes, heteropoda; Phintella vitatta

Observations:

- The College maintains a sound green environment. It is commendable.
- Beautiful and well maintained gardens enhance the aesthetic beauty of the campus.
- The trees and bushes are providing nesting support to some specific indigenous wildlife. It is a specific sign of calm and quite eco- friendly environment of the campus.

Suggestions and Recommendations:

- The existing campus of Sontali Anchalik College, Mahtoli supports a good number of plants and animals of which a few are ecologically, aesthetically and culturally important. All these plant species should be conserved in a proper way to support and to achieve more biodiversity values in future.
- The dedicated garden areas need to be monitored regularly to enhance the aesthetic beauty of the campus.
- Boundary areas may be systematically planted in consultation with a botanist or a horticulturist.

  Students may be encouraged to take care of the plants and the campus

AUDIT SUMMARY

This report on "Green Audit" of Sontali Anchalik College, Mahtoli, Kamrup for the year 2022-23 was prepared with an objective to highlight and prepare a statement on the green practices followed by the college. The present Green Auditing began with the assessment of the status of the green cover of the college followed by water audit, waste management practices and energy conservation strategies etc. The audit team visited different facilities at the college campus, monitored different appliances/utilities and documented the relevant consumption patterns. The faculty members, staffs and learners were interviewed through structured questionaries to get details of usages, frequency, or general characteristics of different appliances. Data collection was done by onside visit also through questionaries in all

the sectors related to environmental quality. Thus, the collected data were analysed to prepare this audit report of the College.

The College located on a huge plot of land of 16.71 acres and the campus is systematically arranged best on its master plan with dedicated spaces for one ornamental garden another botanical garden, one cultivation plot, one pond and two multi sports play grounds. The garden in front of administrative building and avenue trees aligned with the buildings enhance the aesthetic beauty of the college campus. Little disturbances within the dedicated green areas/gardens were observed that need monitoring and interventions boundaries of the college are all most covered with plantation which performs as sound barrier for the campus. Regular monitoring and trimming are therefore suggested at and when necessary.

The Sontali Anchalik College, Mahtoli, Kamrup extracts 4000 Lt. ground water per day to fill up the reservoirs of the capacity one thousand litters. It was noted that wastes of water are very meagre which was also reflected in the consciousness of the stakeholders. The authority is proactive in conserving water and the awareness of stakeholders on water conservation is commendable as well. Further, display signage for water conservation and regular monitoring was found in their places which can be considered as one of the best green practices of the college for conservation of water. The initiative of rain water harvesting in each building are made and channels were connected to a well that was dug for recharge of ground water. Though no fault was found, it is suggested for periodical maintenance of water taps/ water pipe/reservoirs to prevent the loss of water.

In the college, more paper and plastic wastes were recorded to be generated in the administrative blocks and from the canteen whereas, organic waste, was found to be more in the canteen and hostel premises. No report was found on generation of bio-medical waste. The e-waste generation is little in the campus which is disposed of through registered farm. The college has a centralized collection mechanism for any kind of waste excluding the litters and bio-mass generated due to shedding from trees and weeding in the campus. As the college has life skill training centres within the campus like installation of vermicomposting, fish and potato cultivation. Further, in order to carry forward the commitment to keep the campus waste free, installation of dustbins have been started in phase manner. It is also noted that no visible segregation practices exist to separate different wastes which need active attention.

In order to encourage students to respect the environment and think about conservation, in collaboration with NSS Cell and Eco-Club regularly organized different awareness programmes on Swachhata and maintenance of healthy environment a couple of cleanliness drive and plantation programmes were also organized in and around the college campus during last couple of years.

Energy use is clearly an important aspects of campus sustainability and thus requires no explanation for its inclusion in the assessment. Energy is mainly used as requires this college campus for (i) Lightening load, (ii) Laboratory equipment, (iii) Office equipment, (iv) Fan, (v) Water pump and (vi) Cleaning and construction purposes. The main source of electricity in the college is provided by the Assam Power Distribution Company Ltd. The college has installed ten No's of Solar light for the safety of the college at night. LPG are utilized for cooking in canteens and kitchen of the college. The energy efficiency assessment was conducted for the load connected to the main supply of the college building including canteens. LED tube lights which can be considered one of the best practices of energy saving.

A good practice was noted that all the computers are set to automatic power saving mode, when not in use monitoring mechanism exists input - on and put-off the electrical appliances is a laudable eco-friendly effort of the college. The solar installation is poor which needs augmentation.

As the bio-diversity placed a key role in providing numerous irreplaceable services to the community. Bio-diversity audit is one of the best practices for sustainability of an institution. The college campus consisted around 53 numbers of vertebrates and under different phylum. The campus accommodates around 9 amphibians, 8 reptiles' species and 31 birds, and 5 mammals. Where invertebrates present in the campus includes several species of butter flies, earthworms leech and grasshoppers. Many species of other insects like ants, beetles' spiders, bees etc. harbouring of rich faunal diversity indicates a good health of the campus. It is also interesting to note that the college campus provides a sound nesting ground of mongoose, dove, parrot, baya weaver, white-breasted water hen, oriental magpie robin and little cormorant etc.

The campus is evergreen with 49 species of trees, shrubs and herbs including grasses a few ornamentals and economically important plant are introduced in to the campus not only to beautify the campus but also to add values to it since plants provided a good ecological service in maintaining a green campus. These should be conserved in a proper way to support and to achieve more bio-diversity values in future.

In spite of having budgetary and management constraints that limits the effective need of green practices of the College has put every effort to stream line all those practices to make and convert into an eco-friendly and aesthetic campus.

The report contains some specific suggestions and recommendations in each category to be implemented to improve the existing environment related practices of the college.

(Dr. Dhiraj Kr. Das) ***(Dr. Habibur Rahman)***

Auditors

Sontali Anchalik College, Mahtoli, Kamrup, Assam

Green Audit - 2022-23

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Associate Professors, J. N. College, Boko, Kamrup, Assam