

GREEN AUDIT REPORT

2021-2022



SARAIGHAT COLLEGE

P.O. Changsari

Kamrup District

ASSAM

FOREWORD

I, on behalf of Saraighat College fraternity convey my best wishes to the members of the Eco Club for their vision to prepare the Green Audit of the college campus and welcome our well wishers. This Green Audit report is an important and meaningful documentation throwing light on the important parameters of the campus environment, such as water management, healthcare, improvement of energy efficiency and formulation of action plan to reduce misuse of power, importance of renewable energy, air quality and pollution level etc. This is a good initiative taken by all stakeholders for the benefit of the college. This will also help educate all on eco- friendly environment and living therein.

Meanwhile. I would like to thank Dr. Ashok Kr Bora, Professor of Geography, Gauhati University for his guidance and suggestions to bring out this Green Audit pertaining to green and clean campus issues, and also Mr. Bimal Kr Deka, Professor of Assam Engineering College, Guwahati for completion of Energy Audit. All the stakeholders including the Eco Club members who have extended all possible help and co-operation towards completion of this Green Audit Report deserve my sincere thanks.

I hope, the Green Audit Report of the College is a valuable documentation for our institution to go for regular monitoring of the campus environment.



(Dr. Mani Sarmah)

Principal, Saraighat College, Changsari

Principal
Saraighat College

WORDS OF ACKNOWLEDGEMENT

The Green Audit report assists in the process of attaining an eco-friendly approach to the sustainable development of the college. Green Audit Assessment Team sincerely thanks the Saraighat College authorities for assigning the task. We appreciate the cooperation extended to our team during the entire process.

Our special thanks go to Dr. Mani Sarmah, Principal, Saraighat College, Changsari, Professor Ashok Kr Bora, Professor of Geography, Gauhati University, Dr. Bimal Kr Deka, Professor of Assam Engineering College, Guwahati, the IQAC Coordinator of the college, Mr. Navajyoti Patowary, all the members of the Eco Club of the college.

For giving us necessary inputs to this exercise of Green Audit, all the stakeholders deserve special thanks. I, on behalf of the Eco Club express my deep sense of gratitude to Professor Ashok Kr Bora of Gauhati University and Professor Bimal Kr Deka of Assam Engineering College for their suggestions and guidance extended at different stages of Green Audit preparation. I also offer my sincere thanks to Mr Nityaranjan Nath and Mr Arup Jyoti Bora. Research Scholars of Geography, Gauhati University for conducting Campus Survey and GPS mapping. A word of appreciation also goes to all my colleagues of the Eco Club for their constant and untiring help.

Hope that the results presented in the Green Audit Report will serve as guide for educating the college community on the existing environment related practices and resource usage in the college and also help spawn new activities and innovative practices. We expect that the college authorities will be committed to implement the Green Audit recommendations. We are happy to submit this Green Audit report to the authorities of Saraighat College, Changsari.



(Dr. Bhanu Hazarika)

Convener, Eco Club
Saraighat College, Changsari



SARAIGHAT

COLLEGE,

CHANGSARI

ECO CLUB

**THE GREEN CAMPUS, ENERGY AND ENVIRONMENTAL
POLICY**



ECO CLUB

THE GREEN CAMPUS, ENERGY AND ENVIRONMENT POLICY

Context

Saraighat College is situated in the northern bank of the Brahmaputra River and the area is surrounded by beautiful nature and enduring one, something that students and staff of the college are aware of. The campus can be categorized as playgrounds, lawns and gardens. Near the college campus, a swampy areas acts as a natural habitat for biodiversity and a large variety of species of grasses, herbs, shrubs and trees. The college believes in reducing the consumption of electricity produced by non renewable resources by switching to clean energy sources like solar energy for purposes like lighting the campus. We commit to install environment friendly electrical appliances that save energy and reduce wasteful inefficiencies

Policy Documents on the Green Campus

Green Campus: A Green Campus is a place where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus. The Green Campus concept offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of mankind.

Scope of the policies

The Green Campus, Energy and Environment policies will develop exciting new co- curricular and extracurricular practices that encourage students to take the lead in creating positive change. These initiatives call for a thorough review of all infrastructural, administrative functions from the standpoint of energy efficiency, sustainability and the environment.

The focus areas of this policy are:

- Clean Campus Initiatives
- Landscaping Initiatives
- Clean Air Initiatives
- Infrastructure :
 - Solar Power Plant
 - Installation of Energy Efficiency Equipment
 - Water Conservation through Rainwater Harvesting System

- Waste Management process: Solid Waste Management
- Awareness Initiatives
- Environment – centric student, societies and departmental activities.
- Green Audit
- Energy Audit
- Plastic Free Campus

Objective of the Eco Club Committee

The first step of the green programme involves establishing a viable Eco Club Committee, within the organizational structure of the institute. Hence, to give this initiative more clarity and authenticity, we now roll out a POLICY DOCUMENT spelling out the strategies, plans and other allied tasks to make this programme functional officially.

We believe that greening the campus is all about sweeping away wasteful inefficiencies and using conventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling programme. The administration of the Institute believes that everyone has to work out the time bound strategies to implement green campus initiatives. These strategies need to be incorporated into the institutional planning and budgeting processes with the aim of developing a clean and green campus. Every individuals of Saraighat College campus will work, may he/she be a student, faculty and support staff to foster a culture of self-sustainability and make the entire campus environment friendly.

- To protect and conserve ecological systems and resources within the campus
- To ensure judicious use of environment resources to meet the needs and aspirations of the present and future generations
- To integrate environmental concerns in to policies, plans and programmes development for social development and outreach activities.
- To work with all stakeholders and the local community to raise awareness and seek the adoption of environmental good practices and the reduction of any adverse effects on the environment.
- To continuously improve the efficient use of all resources, including energy and water and to reduce consumption and the amount of waste produced and recovering waste where possible.
- To make the campus plastic free.
- To conduct environmental and energy audits from time to time.
- To minimize the use of paper in administration through having policy for E-governance.

Policy:

Clean Campus Initiatives

Saraighat College had pledged to actively coordinate cleanliness activities in the college specially NSS Volunteers and beyond the campus in accordance with the vision of Swachh Bharat Abhiyan. It commits to continue with this programme. The broad vision is as follows:

1. Generating mass awareness on the cleanliness and hygiene amongst students and staff members by holding regular cleanliness drives. The idea is to motivate them to contribute in a proactive manner.
2. Activities under “Swachh Bharat Abhiyan” will be a key component of all the community work being done by NSS and NCC volunteers of the college.
3. Staff Members will be encouraged to participate in the cleanliness drive in the college campus.
4. Events such as poster and slogan competitions, essay writing, poetry recitation and speeches on “Swachh Bharat” will be organized.
5. Rallies on themes connected with “Swachh Bharat Abhiyan” in and around the college campus will be conducted to create mass awareness.
6. Remove all kinds of waste material like broken unusable equipment, etc.
7. Administer of the pledge by the students and staff members to maintain cleanliness of the college campus and its surrounding areas on an annual basis.
8. Commit to manage waste and maintain clean campus especially during college events.

Landscaping Initiatives

The Campus landscape, like its buildings, can be seen as the physical embodiment of a college’s values. It is a vital part of the life of a campus, providing space for study, play, outdoor events, relaxation and aesthetic appreciation. Green campus landscapes also manage runoff, help recharge ground water, and clean and cool the air on campus. The landscape serves as a visual representation of the campus community’s commitment to sustainability. As campus landscapes are so visible and accessible, landscaping initiatives are a great way to build awareness around the environment.

There are more than 240 trees, more than 27 medicinal plants or herbs and more than 500 shrubs on campus along with 1.5 acre of grass cover. The landscape of trees and plants provides 1000+ students and staff with clean and cool air and is a calming environment.

The diverse green cover of Saraighat College is also home to a number of animals and rare birds across at least 24 species, creating a campus rich in biodiversity. The college commits to enriching this healthy habitat and maintaining the symbiotic relation of the institution with nature by

- Organizing tree plantation drives thrice in a year in college campus and adopts villages.
- Encouraging student societies to hold tree planting events.

Clean Air Initiatives

We encourage our students and staff to use public transportation. We encourage carpooling to college, an activity that will control air pollution and strengthen social interaction. The entry of automobiles inside the campus is restricted to discourage the use of private vehicles.

Our college is located near the 31 National Highway and we feel responsible to maintain our green cover. The abundant natural landscape not only cleans the air on campus but also becomes an extension of the green lungs of the area.

Smoking Free Campus

In compliance with the framework provided by the National Tobacco Control Programme (NTCP) 2007-2008, the college prohibits smoking and the use of other tobacco products. The anti smoking committee of the college ensures enforcement of the antismoking policy.

Infrastructure Management Processes

- **Renewable source of energy**

The college is dedicated to minimize and sustainably manage its use of electricity. The college believed in reducing the consumption of electricity produced by non renewable resources by switching to clean energy sources like solar energy for purposes like lighting the administrative department.

- **Energy saving and energy efficient Equipment**

We commit to install environment – friendly electrical appliances that save energy and reduce wasteful inefficiencies. The college believes in using cleaner energy such as LED lighting.

- **Water conservation through Rain water Harvesting System**

As an institution located in the Kamrup District of Assam, the area that has been maximum fall of ground water levels, the college has committed itself to this effort to replenish the ground water table by practicing rainwater harvesting. This practice helps in the replenishment and recharge of the ground water.

Waste Management Processes

The college strive to have a minimal impact on the environment is dedicated to reduce and manage the waste generated by the college campus. The following specific procedures will be undertaken to ensure college's contribution in protecting the environment.

Solid Waste Management

With its aim to provide holistic education that also has a positive impact on the environment, the college will adopt practices that will mitigate the generation and manage solid waste through the following methods:

Biodegradable waste can be found in canteen waste, or as green waste from college campus, food waste, paper waste, etc. These waste can be segregates into biodegradable that rot (undergo degradation in the excavate) by the action of decomposers (tiny organism like bacteria and fungi found in the soil) are called biodegradable waste. Dead plants and other products (eg. Fruits and vegetables peel, waste food, leaves, dead flowers and egg shells and paper) decay very easily. These wastes mix with the soil and produce manure. There is also a different kind

of composting where a kind of earth worm called red worms act on wastes and degrade them. Wastes that do not rot by the action of decomposers are called non- degradable wastes. For example, glass, plastic, electrical wares, metals etc. Depending on the type of wastes, two garbage excavate one for biodegradable waste and other for non biodegradable wastes should be used. This will help in easy sorting and recycling of wastes to make beneficial products. Green excavate for bio degradable wastes like vegetables and fruits peels, spoilt food, tea leaves. Egg shells, tissue paper, leaves etc. Blue excavate for non bio- degradable wastes like glass, bottles, plastics waste, old batteries, polythene bags, etc.

Eco Club Committee, Saraighat College

(2021-2022)

- 1. Advisor : Dr. Mani Sarmah, Principal, Saraighat College**
- 2. Convener : Dr. Bhanu Hazarika, Hod, Dept. of Geography, Saraighat College**
- 3. Teacher members :** (a) **Dr. Jyotirmoyee Devi**
(b) **Dr. Maushumi Mahanta**
(c) **Sri Hemen Kalita**
(d) **Ms. Nirupama Roy**
- 4. Student member : Mr. Suman Nath**
- 5. Student representatives from NSS :** (a) **Mr. Chinmoy Deka**
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GREEN AUDIT

SARAIGHAT COLLEGE

Certificate

It is certified that this Green Audit Report of Saraighat College is based on the original data acquired during the period of study. It is also certified that the necessary baseline information, facts and data are prepared and compiled by the Eco Club team (Internal Green Audit Team) of the college and the same are submitted to me. The information and data incorporated in the report have been thoroughly checked with spot verification for their reliability. Further certified that the data used in this report are original in nature and these are not published and presented anywhere. The field survey data and photographs are taken either by the undersigned and his assistants or by the internal audit team, i.e. Eco Club team.

Date: 27-08-2022


Dr. Ashok K. Bora
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Expert in Environmental
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1. INTRODUCTION

Green auditing is a process undertaken to identify and assess whether the institutional practices are environmentally sound, eco-friendly and sustainable. In an establishment at a specific site, green auditing is a regular process to be carried out to identify, document, monitor and report the significant and relevant components of the prevailing environment. It helps collect and prepare baseline data and appropriate database pertaining to environmental parameters and resolve environmental issues before they emerge as problems. Green Audit Report is thus a systematic documentation of the campus environment which empowers the institution to plan for practice of green initiatives and better environmental performance.

Any campus as a working place essentially needs to go green and clean. It is more necessary in a campus of an educational institution where programmes for healthy and prospective human resources development are run. In this context, a Green Audit Report of the Saraighat College campus has been prepared. Moreover, Hon'ble Prime Minister, Shri Narendra Modiji has rightly declared the 'Swachh Bharat Abhiyan' as a national mission in the light of which the University Grants Commission (UGC) has also upheld the concept of 'Green Campus, Clean Campus' for the higher educational institutions. As an autonomous body funded by the UGC, the National Assessment and Accreditation Council (NAAC) has included the criterion 'Environmental Consciousness' as one of the mandatory criteria (Criterion VII) in the process of assessing and grading the higher educational institutions.

Considering the degree of environmental awareness increasing at all levels - regional, national and global and the importance laid on green and clean initiatives by the appex educational bodies, the Saraighat College authorities have also given due priority to its campus environment, besides highly prioritizing the academic environment. It is in this context, Saraighat College has prepared the Green Audit Report for its campus.

2. OBJECTIVES AND METHODOLOGY APPLIED

(A) OBJECTIVES

The Green Audit of the Saraighat College campus has been carried out by the Green Audit Committee of the college with the following objectives:

- (i) To identify and analyse the currently prevailing environmental problems and issues in the campus.

- (ii) To assess the strength and weakness of the practices presently adopted in the campus and examine their impacts on the environment.
- (iii) To monitor the environmental management practices in terms of their functioning, need and importance.
- (iv) To create and arouse awareness about environment of the campus among all concerned and stakeholders.
- (v) To prepare and document a Green Audit Report of the college campus for all time reference and follow-up action.

(B) METHODOLOGY APPLIED

In order to conduct the Green Audit of Saraighat College, a methodology comprising the following components was applied:

(i) Field visit : The Green Audit (G.A.) team of the college made spot visits in the campus as and when necessary.

(ii) Onsite interviews : The G.A. team met all different stakeholders associated with energy consumption, water use, garden maintenance, wastes disposal, cleaning and sanitizing activities etc. and collected relevant and necessary information.

(iii) Collection of water samples and quality analysis : The sources of water use and supply in the campus are identified and water samples were taken from each of the water source points. The collected water samples were analysed in the Geomorphology Laboratory of the Dept. of Geography, Gauhati University using standard methods and instruments.

(iv) Software for campus mapping and Land use land cover (LULC) assessment : The satellite based Geographical Information System (GIS) technology with Arc GIS software and also the GPS technology were used for campus mapping and LULC analysis.

(v) Air quality and pollution level monitoring : Using internet, the air quality and pollution level of the college campus are monitored on monthly basis during winter and summer seasons.

(vi) Noise level measurement : Noise level measurements were taken using standard equipment at different locations in the college campus.

(vii) The floral and faunal species account : The floral and faunal species were recorded by the G.A. team during campus survey and monitoring.

3. CAMPUS MAPPING AND LAND USE LAND COVER ASSESSMENT

The college campus is a compact one characterised by flat land surface. It has an extension of 26°15'33" N to 26°15'38" N latitude and 91°41'40" E to 91°41'48" E longitude. The campus as a whole is situated at 50 m average elevation from the mean sea level. The campus is bordered by the habited area on the north, marshy wetlands on the south, scattered vegetative land and road on the east and the N.H. No.1 on the west. A map of the college campus depicting all relevant features has been prepared with the help of GIS software and GPS survey conducted by the Department of Geography, Gauhati University, which is shown in **figure 1**.

Table 1 : Land Use Land Cover (LULC) Statistics of Saraighat College Campus

Sl. No.	LULC Types	Area Covered (m ²)	Percentage of Area to the Total Campus Area
1	Open Space	6260.93	52.11 %
2	Grassland and Vegetative Area	841.75	7.00 %
3	Garden Area	325.2	2.71 %
4	Building & Establishment Area (All)	3412.76	28.41 %
5	Area of Construction Site	494.92	4.12 %
6	Parking Space	358.03	2.98 %
7	Area under Internal roads (Paths)	320.63	2.67 %
Total Area		12014.22	100 %

Source : Based on GPS survey carried out in the campus

The total campus area of the college is 12014.22 m², out of which the highest area of 52.11% is covered by open space. Buildings and establishments span over 28.41% of the total campus area. Grassland and vegetative area covers 7% of the campus, while the parking space, garden area and area under internal roads cover 2.98%, 2.71% and 2.67% area respectively. Area under construction sites accounts for 4.12% of the campus area. It is good that there is enough open space in the campus accounting for more than half of the entire campus area. The land use land cover (LULC) types of the campus along with their area coverage are presented in the **table 1**.

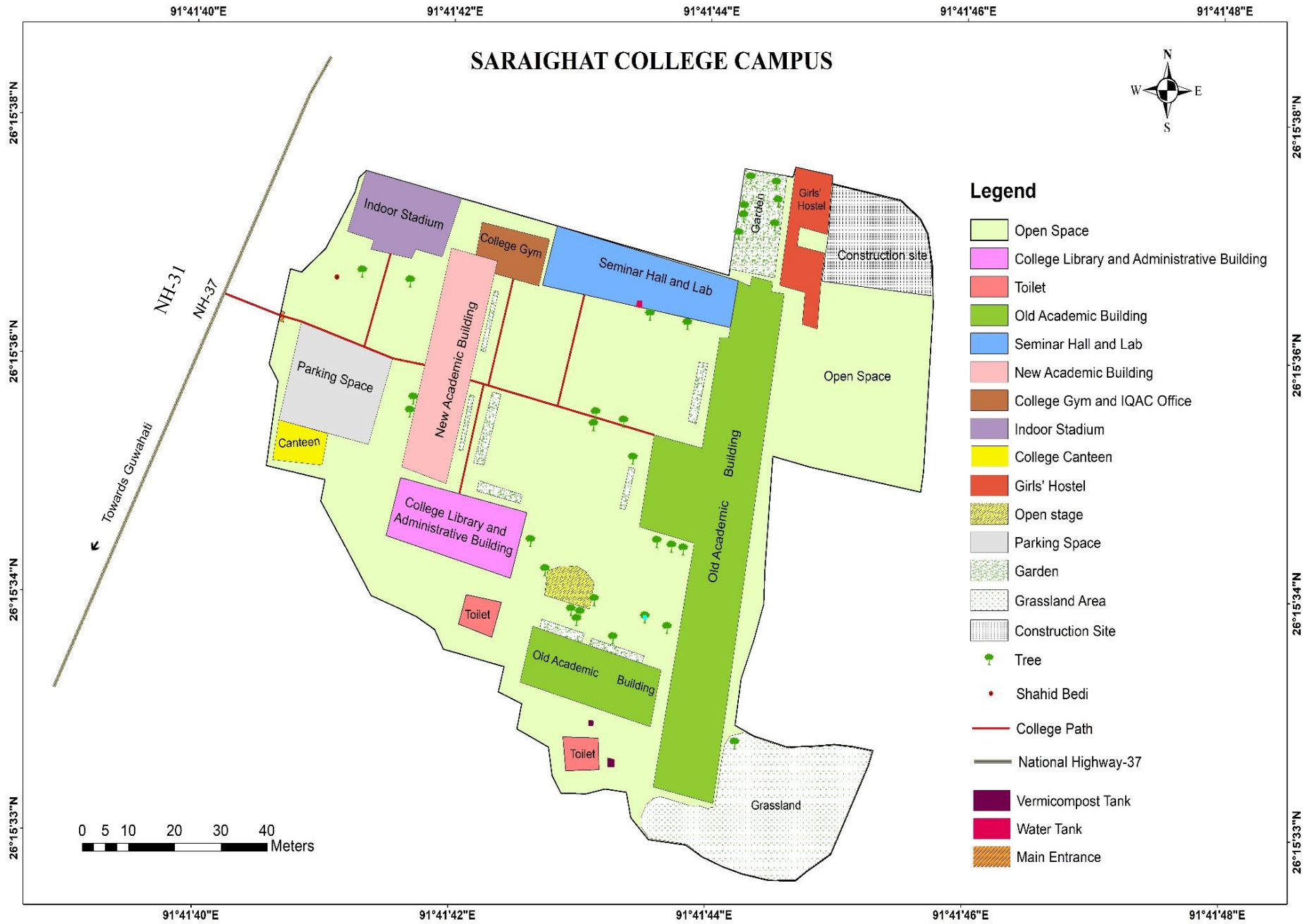


Figure 1: Land Use Land Cover (LULC) Map of Saraighat College Campus

4. WASTE MANAGEMENT AUDIT

Wastes are produced and created by man and his various activities. Wastes pose threat to the environment and ecology of any place or region. Wastes also cause human health hazards by polluting land, air and water. Wastes may be of three types, viz. biodegradable wastes, non-biodegradable wastes and hazardous wastes. On the basis of their state, wastes may be of solid and liquid types. Management of biodegradable wastes is relatively easier than that of the non-biodegradable and hazardous wastes. Food wastes produced from canteens and kitchens are biodegradable wastes, while the wastes like plastic materials, tins, glasses etc. are the non-biodegradable wastes. The hazardous wastes, on the other hand include the chemicals and other toxic materials which are directly harmful to human health. However, the solid wastes of different kinds may be reduced, recycled and reused through proper management practices.

In a campus of an educational institution, wastes of various types are generated. In the Saraighat College campus also such wastes are produced from different sources. These wastes generally include paper wastes, plastic wastes, organic wastes and e-wastes. The wastes are mostly produced from the academic departments, administrative office and the canteen. It is estimated that on the average per week, 13.1 kg of different types of solid wastes are generated by various stakeholders of the college (**Table 2**).

As regards solid waste disposal, the biodegradable and non-biodegradable wastes are separately gathered at two collection points (Photographs attached) and delivered and disposed through a private agency called Agri Tech Industry, Changsari. Constant efforts have been made to reduce the volume of wastes generation and also to make the college campus plastic free. In the case of liquid wastes, a drainage system in the college campus works to drain out the liquid wastes from the campus. The debris wastes produced from the construction sites are removed from the campus by the concerned contractors. There are no chemical and other toxic substances produced in the campus, as there are no science laboratories in the college.

Table 2 : Solid Wastes Generated by Various Stakeholders

Sl. No.	Stakeholders	Types of solid wastes	Solid waste in Kg. generated per week on average	P.C. of amount generated
1	Administrative Establishment	• Paper waste	1.20	38.10
		• Plastic waste	1.00	31.75
		• Organic waste	0.75	23.8
		• E - waste	0.20	6.35
2	Academic Establishments	• Paper waste	2.10	36.21
		• Plastic waste	1.40	24.14
		• Organic waste	2.00	34.48
		• E - waste	0.3	5.17
3	Hostel	• Paper waste	0.25	25.00
		• Plastic waste	0.40	40.00
		• Organic waste	0.25	25.00
		• E - waste	0.1	10.00
4	Canteen	• Paper waste	0.40	12.70
		• Plastic waste	0.60	19.05
		• Organic waste	2.15	68.25
		• E - waste	—	—
Total = 13.1 kg				



Photograph shows the Bio-degradable solid waste collection point



Photograph shows the Non bio-degradable solid waste collection point

5. WATER RESOURCE AUDIT

Water is one of the most important and vital natural resources. Water keeps the life-support system alive and active. Health of the environment mostly depends on the status and quality of water resources. It is a precious resource on the earth which can be established from the fact that out of the total water on the globe (100%), only 0.26% water is available for human use. Moreover, there is every possibility of getting water polluted due to increasing human activities on the earth. Thus, there arises an imperative objective and need to keep water resources clean and safe from being polluted and contaminated in the environment. Such objective and need are also certainly required to be pursued in the campus environment of Saraighat College for proper monitoring, use and management of water resources.

Water Sources, Uses and Management

Water is used by the college communities for the purposes like drinking, washing, cleaning, use in the toilets, hostels, canteen, flower gardens etc. A list of water use purposes is given in **table 3**.

Table 3: List of Purposes of Water Use in the College Campus

(A) Purposes

(a) Drinking purpose for all

- (b) Toilets and wash rooms used by boys' and girls' students, teachers, Principal, Guests and resource persons, office staff and other employees, library staff, hostel boarders, canteen staff etc.
- (c) Gardening, lawn and tree plants maintenance.
- (d) Floor wash and room cleaning
- (e) Cooking purpose in canteens and hostels.
- (f) Construction purpose

(B) Other related information on water use

- (i) Number of toilets and urinals in the college: 55 (Fifty-five)
- (ii) Number of toilets and urinals without water supply: Nil
- (iii) Number of water filters installed: 4 (Four)
- (iv) Number of water taps/ water use points: 120(One Hundred Twenty)
- (v) Number of small water tanks/ water storage: 5 (Five)

Water used in the college for various purposes is obtained from different sources which are identified as (i) Hand Tube well (ii) Deep Boring (iii) Water Reservoir (storage tanks) and (iv) Rain Water Harvesting Unit. The specifications of these water sources are presented in **Table 4.**

Table 4: Specifications of Water Sources in the College Campus

Source of Water	Units / Numbers	Depth of water lifting	Sufficiency of Water Quantities
(i) Hand operated Tube well	02	20 m	Sufficient water obtained
(ii) Motor-driven Deep Boring	01	95 m	Sufficient water obtained
(iii) Water Storage Tanks (Reservoirs)	05	_____	Sufficient water reserved with a total capacity of 5000 litres
(iv) Rain Water Harvesting Unit	01	_____	Water collected season-wise to meet some needs during rain deficit season

In order to assess the water qualities of the water obtained from the sources, water samples have been collected from the four sources and within 24 hours from the time of sample collection, the water samples are properly put for quality analysis in the Laboratory of the Department of Geography, Gauhati University. A standard procedure is followed using a sophisticated instrument ‘OTT Hydro lab DS 5’.

The water quality results separately for each of the four sources are found in respect of certain water quality parameters which are mentioned in **table 5**. The water quality results are obtained in respect of all total 13 water quality parameters, which are listed in table 5. Among these parameters the important ones are pH, Iron, Alkalinity, Total Dissolved Solids, Turbidity, Chloride, Fluoride, Arsenic and Total hardness. It is found that the quality status of water of the four sources in the campus is within the reference as well as tolerance limit.

Table 5: Water Quality Results for Water Samples Collected from Different Sources in the College Campus

Sl. No.	Water Parameters	Parametric values in respect of the water sources			
		Hand Tube well	Deep Boring	Water Reservoir (storage tanks)	Rain Water Harvesting Unit
1	Temperature (⁰ C)	23.08	23.26	23.63	23.56
2	Total Dissolved Solids (mg/l)	20	23	27	31
3	pH	6.61	6.53	6.81	6.90
4	Turbidity (N.T.U)	0	0	0	0
5	Alkalinity (mg/l)	78	82	104	126
6	Total Hardness (mg/l)	66	70	92	103
7	Iron (mg/l)	0.13	0.18	0.20	0.16
8	Manganese (mg/l)	0.20	0.27	0.23	0.25
9	Magnesium (mg/l)	10	14	11	16

10	Arsenic (mg/l)	nil	nil	nil	nil
11	Fluoride (mg/l)	0.19	0.22	0.28	0.25
12	Chloride (mg/l)	2	5	6	7
13	Calcium Hardness (mg/l)	11	12	14	13

Source: Based on water sample analysis conducted in the Geomorphology Laboratory of Geography department, Gauhati University

Although resources may be plenty and available, their management is the most important component in the sector of resource utilization. In the campus of Saraighat College, there is no scarcity of water for use in any purpose. Availability of water is ensured in the campus for 24 hours. In addition to water collected from hand tube well and rainwater harvesting, a total of 5000 liters of water are stored in 5 reservoir tanks. Water through rainwater harvesting is collected on the annual average of 15000 litres, which is used for various purposes as and when required (Photograph given below). Considering all the four sources, the amount of water used on a daily average basis in the campus is about 2,500 litres. For drinking purpose, water is purified as shown in the following photograph.



Water Harvesting Unit



Water Purification Unit

6. HEALTH AUDIT

It is an emphatic yes that health is the vital asset of human life and society. Health is undoubtedly one of the most important and integral resources of the global citizens of the 21st

century. High growth of population in the world today has triggered the demand for healthcare and health caring resources at all levels ranging from individual to national and global level. But in the event of population explosion and degrading physical and social environments, human health is certainly exposed to threats. Thus, awareness about health and its related issues have grown in a big way in the societies around the globe. Such health-centric awareness is an imperative need for the citizens, and more particularly for the students who are in the formative stages of human resource development. Therefore, health status and health issues of the students are of focal concern from productive human resource development point of view. Keeping this point in mind, the Saraighat College authorities have come up with an aim to arouse health awareness among the students in particular, and the teachers and office staff in general.

The College has organised ‘Free Health Check-up and Health Awareness Programmes’ at its campus in collaboration with the Guwahati Neurological Research Centre (GNRC) of North Guwahati, Assam. The main aim of these health camps is to make the teachers, students and office staff aware of their health status and to conduct health check-up for them and provide necessary medical advice by medical team of experienced doctors and nurses from GNRC, Guwahati. The following table (**Table 6**) presents the information about the health check-up camps organised in the college campus.

Table 6 : Health Check-up Programmes Held in College Campus

Sl. No.	Date of the Programme	Location	Participating Members
1	04/09/2018	Saraighat College	170
2	25/09/2019	Saraighat College	260
3	16/11/2022	Saraighat College	165



Photograph shows the health check-up programme in the college



Photograph shows the health check-up programme in the college

The college has one day care health centre where one nurse has been appointed and one medical officer (Doctor) visits on two days in a week and also on emergency need. Moreover, there is also the provision of physical exercise for which a gymnasium centre has been established. The gymnasium centre remains open daily from 7 am to 9 am and it is equipped with the following facilities (**Table 7**):

Table 7 : Facilities Available in the Gymnasium Centre of the College

Sl. No	Name of the Machines/Equipments	Nos.
1.	Multi Stationed Machine (7 seater)	1
2.	Treadmill	1
3.	Twister	1
4.	Cycle	1
5.	Pec-Dec Machine	1
6.	Dumbbell (Different –weight ranging from 2.5 kg to 15 kg)	1
7.	Weight plate (Different –weight ranging from 2.5 kg to 15 kg)	1
8.	Weight lifting bars	1

In addition to the gymnasium centre, there is also one Indoor Stadium in the college. The size of the indoor stadium is 18 m × 15 m, which provides facilities for the students to play the indoor games like Badminton, Table Tennis, Kabbadi.

7. ENERGY AUDIT

Energy Audit is an assessment of energy scenario in a setting. The energy scenario of the Saraighat College campus is assessed in terms of energy of both renewable and non-renewable sources, power requirements, and their consumption pattern. The audit also deals with issues relating to improvement of energy efficiency and formulation of action plan to reduce energy consumption in the campus.

Types of energy used and consumed in the campus include mainly electricity and natural gas (Cooking LPG). In order to meet the required demand of energy, the supply of energy in the campus is obtained from electricity connection from the Assam State Electricity Board, cooking gas for hostel and canteen from Gas Agency, Changsari and solar power from Roof-top Solar Panels obtained from Assam Energy Development Agency (AEDA) and installed by PAE Renewable Private Ltd, Guwahati.

Use of energy from non-renewable source should not be encouraged and in contrary to this, energy use from renewable source should be promoted. Therefore, a number of Solar Panels are installed in the campus, which is a good source of renewable energy, i.e. solar power. On the other hand, efforts have been made to reduce the electricity consumption in the campus. For this purpose, the common electric bulbs and tubes are replaced phase-wise by the LED bulbs and tubes, which are power efficient as well as low power consuming ones. Presently, there are 323 numbers of LED bulbs in operation in the campus.



Photograph shows the roof-top solar panels in the college

The pattern of electricity power use in the college indicates that 1832 units of electricity were consumed on a monthly average during the year 2021 and also 2022 (considering 10 months up to October for 2022). In the year 2020, the electricity consumption on a monthly average was 1720 units. Statistics indicate that there is an increase of average electricity consumption on the campus which can be attributed to the fact that there has been extension and renovation of rooms and buildings. From the Solar Panels (34 nos.), 4 KWH of solar power is produced monthly to use in the campus. There are 09 numbers of Air Conditioner (AC) in few of the administrative and academic units/rooms. In the college canteen 03 numbers of LPG cylinders are needed per month, while the college Girls' Hostel uses 01 number of cylinder per month. Due to limited numbers of girl students in the hostel, the consumption of LPG is confined to 1 unit only.

However, constant efforts have been carried out by the college authorities to reduce power consumption in the campus through measures like (i) Use of LED bulbs (ii) Increase in Solar Panels (iii) Strict monitoring to check power loss and wastage (iv) Awareness about power use, management and healthy campus environment.

8. ENVIRONMENTAL QUALITY

Assessment of Air Quality and Pollution Level

In order to assess the air quality as well as pollution level in the college campus, data obtained from Internet source on seasonal basis during summer and winter seasons available for the Changsari – Kamalpur area have been used for assessing the air quality of Saraighat College Campus.

Table 8: Status of Air Quality and Pollution Level in the College Campus (based on Air Quality Status for Changsari – Kamalpur Area

Locations	Air Quality Index (AQI)		Pollution Level as per Central Pollution Control Board, Govt. of India Norms	
	Summer	Winter	Summer	Winter
Saraighat College Campus	108	97	Moderately Polluted (101 - 200 for moderately polluted air)	Satisfactory (51 – 100 for satisfactory air quality)

As there are no industries located in the vicinity of college, the overall air quality and pollution level in the campus is within permissible limit. Pollution level is little high in the summer season whereas it is relatively less during winter season.

Assessment of Noise Level

Noise is a component of environmental pollution, as recognised under the Air (Prevention and Control of Pollution) Act, 1981 of Government of India. Pollution level is generally assessed in two situations, viz. (i) Community area, where noise is categorised as community-induced noise and (ii) Industrial area, where noise is categorised as industry-induced noise. The permissible noise level prescribed by World Health Organization (WHO) guidelines for community-induced noise in residential area is limited to less than 30 dB. For classrooms, it is limited to less than 35 dB, which is congenial for teaching and learning environment.

In order to assess the noise pollution level in Saraighat college campus, a survey was conducted by the Department of Physics, J.N College Boko, Kamrup (Assam) at different locations with a Sound Level Meter (Model: Envirotech SLM 100, Type II db A). The noise level measurements were taken at five locations of the college campus, viz. (i) At main college gate, (ii) At northern boundary, (iii) At southern boundary, (iv) At eastern boundary and (v) At middle position of the campus during working daytime on 16th August, 2022. The results of the noise levels are presented in **table 9**.

Table 9: Noise Levels at Different Locations of the College Campus

Survey locations	Noise Level in dB Leq		Permissible (daytime) noise limit as per Central Pollution Control Board (CPCB)
	10 am – 12 noon	2 pm – 4 pm	
(i) Main College Gate	62.3	61.6	For silence zone - 50 For residential zone - 55
(ii) At Northern Boundary	52.2	51.0	
(iii) At Southern Boundary	45.4	43.7	
(iv) At Eastern Boundary	42.4	41.6	
(v) At Mid-Campus position	48.7	47.8	

It is observed from the table 9 that the highest noise level is found in the order of 62.3 – 61.6 dB Leq at the Main gate of the college about 15 m away from the N.H.-1. This level appears to be high due to dense traffic on the National Highway. As the college buildings are located at about 40 m away from the National Highway and the buildings are not facing the road, the noise level is decreasing in the campus. Beyond the northern boundary, some residential areas are located for which the noise level is relatively little bit high. On the eastern and southern boundaries, noise level remains low due to vacant areas. But at the central position of the college around which all academic and administrative buildings are situated, the noise level again goes little up to the tune of 48.7 – 47.8 dB. Considering all the figures on noise level, it can however be said that the noise pollution level in the college campus is not causing any problem.

Soil Quality Status

The quality of the soils in the college campus is good and fertile. Soils are of old alluvial type with high proportion of clay particles. In order to keep the soils unpolluted, chemical fertilizers are avoided. But, organic manures are used, especially for the flower plants in the gardens and other plant species of the campus. It is good that the necessary organic manures for the college garden are produced from the vermicompost unit developed in the campus itself.

9. BIODIVERSITY AUDIT

The college campus is characterised by varieties of floras. The trees and plants found in the campus landscape are listed in **table 10**.

Table 10: Details of Floral Species in the Campus

Sl No	Common Name (Assamese)	Common name (English)	Botanical name	No. of Species
1.	Aam (20)	Mango	Clausiaceac	Mangifera indica
2.	Bakul (9)	Maulsari	Mimusops elengi	NK
3.	Bottle Bruss(5)	Bottle bruss	Callistemon	NK
4.	Shishu (21)	Sheesham tree	Dalbergia Sissoo	NK
5.	Madhuri Aam(20)	Guava tree	Psidium guajava	NK

6.	Krishna Sura (1)	Gulmahar tree	Delonix regia	NK
7.	Jalpai (1)	Olive tree	Elaeocarpus	NK
8.	Eucalyptus (38)	Eucalyptus	Eucalyptus globulus	NK
9.	Sunaru (1)	Golden shower tree/Indian Laburnum	Cassia fistula	NK
10.	Mahaneem(15)	Margosa tree	Azadirachta indica	Meliaceae
11.	Dalim (1)	Pomegranate tree	Punica granatum	NK
12.	Jamun (7)	Jamun tree	Syzygium cumini	NK
13.	Narikal (2)	Coconut tree	Cocos nucifera	NK
14.	Paniwal(7)	Coffee plum	Flacourtia Jangomas	NK
15.	Halfuli (4)	Duthie	Syzygium Kurzil	NK
16.	Bhumura (2)	Combrataceae	Belleric Myrobalan	Terminalia belerica
17.	Nahar (1)	Nagpuspa tree	Mesua ferrea	NK
18.	Debdaru (7)	Mast tree (Deodar)	Polyalthia longifolia	NK
19.	Kathal (1)	Jack fruit tree	Artocarpus chama	Moraceae
20.	Aamlakhi(1)	Indian gooseberry	Phyllanthus Embilica	Euphorblaceare
21.	Akashi (1)	Amsia	Dellenia Pentagyna	NK
22.	Ghura Neem (1)	China Berry	Melia azedarach	NK
23.	Khajur (1)	Date tree	Phoenix Sylvestris	NK
24.	Radhasura (2)	Peacock tree	Caesalpinia pulcherrima	NK
25.	Sewali (4)	Night flowering Jasmin tree	Nyctanthes arbortritis	NK
26.	Kanak sura(2)	Karoi tree	Albizia lebbeck	Pettophorum
27.	Teteli (1)	Tamarind tree	Tamarindus indica	Fabaceae
28.	Sisis (4)	Siris plant	Albizia lebbeck	Fabaceae
29.	Arjun tree (1)	Arjuna Tree	Terminalia Arjuna	Combretaceae
30.	Simalu tree(4)	Silk cotton tree	Bombax ceiba	Malvaceae
31.	Bagari tree (2)	Plum	Prunus domestica	Rosaceae
32.	Neemu (6)	Lemon tree	Citrus Lemon	Rutaceae
33.	Tamul (4)	Betelnut tree	Areca catechu	NK

Contd.

34.	Aajar (1)	Pride of India	Lagerstroemia speciosa	L.speciosa
35.	Kanchan (7)	Purple Bauhinia	Bauhinia purpurea	Leguminos
36.	Salkuwari (8)	Aloe vera	Barbadensis	Rutaceae
37.	Nara Singha (4)	Curry tree	Murraya koengil	NK
38.	Karoi (3)	White Siris	Albizia procera	NK
39.	Hilikha(1)	Black Myrobalan	Terminalia Chebula	NK
40.	Karabi (5)	Casabela	Nerium Oleander	NK
41.	Ram tamul(1)	Aracaceae	Pinanga Gracilis	NK
42.	Sao tree (4)	Anamee plant	Mauritia flexuosa	Arecaceae

Note: The numerical figures in the parenthesis indicate the number of plants.

As regards faunal species, their diversity is relatively less as compared to floral diversity. This is due to the fact that the campus landscape is not dotted with water bodies, bushes, forests and other significant land features. However, there are some faunal species like butterflies, some local birds, reptiles, spiders, grasshoppers etc.

The medicinal plants found in the campus are recorded and these are presented in table11.

Table 11: Medicinal Plants of the College Campus

Details of Medicinal plants in the Campus				
Sl No	Common Name(Assamese)	Common name (English)	Botanical name	Name of Species
1.	Alovera	Aloe barbadensis miler	Asphodelaceae	NK
2.	Tulshi	Ocimum tenuiflorum	Lamiaceae	Plantae
3.	Narasimha	Curry tree	Bergera Koenigil	Rutaceae
4.	Citranelia	Cymbopogon nurdus	Poaceae	NK
5.	Giloy (Guluncha)	Tinospora cordifolia	Tinospora cordifolia	Menispermaceae
6.	Nayan Tara	Catharanthus Roseus	Magnoliopsida	Apcynaceae
7.	Bhedailata	Skunkvine	Paederia Foetida	Rubiaceae
8.	Kathanda	Tabernaemontana Divaricata	Crape Jasmin	Apocynaceae
9.	Amarlata	Tinospora Cordifolia	Tinospora Cordifolia	Menispermaceae
10.	Kala Kachu	Theophrastus	Monsteoideae	Araceae
11.	Tengesi tenga	Indian sorrel	Oxalis CorniculataLinn	Oxalidaceae
12.	Bos	Acorus calmus	Acorus calmus	Araceae
13.	Pategaja	Acanthaceae	Bryophyllum pinnatum	Crassulaceae
14.	Mahanim	Azadirachta indica	Azadirachta indica	Meliaceae
15.	Brahmi	Bacopa monnieri	Bacopa monnieri	Scrophulariaceae
16.	Akan	Asclepiadaceae Akan	Calotropis procera	Asclepiadaceae
17.	Manimuni	NK	Centalla asiatica	Apiaceae
18.	Aparajita	NK	Clitoria ternatea	Fabaseae
19.	Haladhi	Termeric	Curcuma domestica	Zingiberaceae
20.	Dhekia	NK	Blechnum orientale	Blechnaceae
21.	Doron Ban	NK	Leucas linifolia	Lamiceae

10. OBSERVATIONS AND RECOMMENDATIONS

The Green Audit Committee visits the green practice sites/spots and meets the stakeholders regularly. Necessary recommendations and advices are suggested to all concerned and also placed before the college authorities for proper implementation and actions.

- (i) The green cover in the campus needs to be maintained with due care.
- (ii) Water leakages and water resource waste need to be reduced. During the visit of the G.A. team, three points are identified where there are water leakages and water loss, which need to be taken care of.
- (iii) Energy use in the campus should be properly monitored so as to avoid loss of energy. Necessary measures already taken to follow time table for switch off and switch on of electric bulbs, fans etc. in the classrooms and different locations within the campus should be strictly continued.
- (iv) More emphasis and importance should be laid on gradual increase in solar panels with an aim to make the college gradually dependent on solar energy (renewal energy source) in near future.
- (v) Use of plastics in the college campus should be totally prohibited.
- (vi) Efforts already made to reduce the volume of non-biodegradable waste production should be continued as far as practicable.
- (vii) Rainwater harvesting unit needs to be upgraded to cover more roofs of the college.
- (viii) Presently there is no water treatment provision in the college so as to treat the waste water generated from canteen, hostels, washrooms etc. But, if possible, in future, the water treatment provision should be made.
- (ix) The open water body and marshes situated adjacent to the southern boundary of the campus attract varieties of birds, especially during winter, and taking the advantage of such scenic beauty, a bird watching tower may be erected for the nature lovers.
- (x) In order to protect the campus from noise pollution arising due to the location of the nearby National Highway, there should be plantation of suitable trees along the front side as well as the western boundary of the college.

It is felt that all the stakeholders should be made aware of the concept of 'Green and Clean Campus' which requires collective involvement and participation to continue the green practices and efforts in the campus.
