2022-2023

GREEN AUDIT REPORT

OF

KAMRUP COLLEGE

Chamata, Nalbari

AUDIT COMPONENT:

GREEN CAMPUS (BIODIVERSITY) AUDIT

PREPARED BY

ASSAM SCIENCE TECHNOLOGY AND ENVIRONMENT COUNCIL

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BHANGAGARH, GUWAHATI-05

অসম বিজ্ঞান প্রযুক্তিবিদ্যা আৰু পৰিৱেশ পৰিষদ
(বিজ্ঞান, প্রযুক্তি আৰু জলবায়ু পৰিৱর্তন বিভাগ, অসম চৰকাৰ)
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No. ASTEC/ENV/2161/2023/726 Dated: 07/03/2024

DECLARATION

It is hereby declared that Assam Science Technology and Environment Council (ASTEC) have conducted a **"Green Audit"** for **Kamrup College** on **13th February 2024** for the academic year 2022-2023. The green audit was conducted in accordance with the applicable standards prescribed by the Central Pollution Control Board, New Delhi, and the Ministry of Environment, Forest and Climate Change, New Delhi. The audit involved the following target area: **Biodiversity (Green campus) Audit** and the audit report provides the college with recommendations that can be used to develop an 'Environmental Management Plan', which the institution can follow to minimize the impact on the institutional working framework. In an opinion and to the best of our information and according to the information given to us, said green and environment audit gives a true and fair view in conformity with environmental auditing principles' accepted in India.

Date: 07/03/2024
Place: Guwahati

Director
ASTE Council

ACKNOWLEDGEMENT

The green audit team of Assam Science Technology and Environment Council (ASTEC) express our sincere gratitude to Kamrup College, Chamata, Nalbari, for choosing the organisation to conduct a Green Audit for their college and giving us the opportunity to be a part of their mission towards environmental sustainability.

We are thankful to Dr. Debendra Kumar Bezbaruah, Principal, Dr. Kabita Choudhury, Vice Principal, and faculty members Dr. Biswajit Das, Mr. Nipu Kumar Das, Ms. Darathi Deori, Ms. Rimpa Lahkar, Ms. Chayanika Rabha, Ms. Sairy Das, Dr. Bhaben Kakati, Dr. Sanjib Kumar Goswami, Mr. Lohit Talukdar (Librarian), IQAC committee members and other teaching and non-teaching staff of Kamrup College with whom we have interacted during the audit for their valuable support and cooperation through sharing of information sought during the assessment and providing the needed inputs to carry out this green audit. Their willingness to participate in this programme is truly commendable and is duly acknowledged.

Green Audit Team
ASTE Council

EXTERNAL GREEN AUDIT TEAM

(Assam Science Technology and Environment Council)

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EXECUTIVE SUMMARY

Environmental development is viewed as a critical component in educational institutions, which serve as the foundation for a country's development. Environmental challenges are becoming increasingly important in educational institutions, which serve as the foundation for a country's development. Educational institutions are becoming more aware of environmental challenges, and more eco-friendly practices are being implemented. Many educational institutions use a variety of ways to address environmental issues on campus. It is critical, especially at educational institutions where young minds congregate, to provide an eco-friendly and sustainable environment with long-lasting characteristics. Therefore, conducting a green audit is an important first step towards creating an eco-friendly environment in educational institutions.

The process of determining and analysing whether an institution's practices are sustainable and environmentally friendly is known as "green auditing." The primary purpose of performing a green audit at **Kamrup College, Chamata, Nalbari,** is to assess the institution's green practices and create an in-depth audit report to establish where we stand on the environmental coherence spectrum. Kamrup College's commitment to complete a Green Audit of its campus is a noteworthy sustainable goal.

For the green audit, one target area was identified and audited: **Green campus (Biodiversity)**, where the total biodiversity of the campus as well as green practices relevant to green campus were observed and analysed. Pre-audit meetings were held, questionnaires on the designated target area was prepared, on-site physical assessments and questionnaire surveys were conducted, recommendations and an action plan were provided, and an audit report was prepared. The questionnaires were created using the guidelines, regulations, acts, and formats established by the Government of India, Ministry of Environment and Forest, New Delhi, and Central Pollution Control Board, New Delhi. The Green Audit's results are just indicators of where and why extra efforts are required, not a critique or endorsement of the organization's current performance.

1. INTRODUCTION

A nation's educational institutions lay the groundwork for its development, with environmental development playing an important role. Environmental issues are becoming more prevalent in today's educational institutions, and new ideas are being applied to make them more eco-friendly. Numerous educational institutions employ a variety of strategies to address environmental issues on campus, such as energy conservation, waste recycling, wastewater reduction, and water harvesting. Educational institutions' operations can have an array of negative environmental repercussions. Environmental sustainability is a growing concern across the country. It is vital to create a sustainable atmosphere, especially in educational institutions where young minds congregate. The green influence on campus is critical for creating an optimal learning environment and a balanced ecology for everyone involved with the schools.

Beginning with the academic year 2016-17, the National Assessment and Accreditation Council (NAAC) in New Delhi requires all higher education institutions to submit an annual Environmental or Green Audit Report. Higher education institutions' corporate social responsibility requires them to help reduce global warming through carbon footprint reduction methods. Environmental auditing, sometimes known as "green" auditing, compares an organization's environmental performance to its environmental objectives and standards. A "green audit" is a formal investigation into an organization's environmental impact. As part of this activity, a green audit is carried out to assess the current situation on campus.

1.1. CONCEPT OF GREEN AUDIT

The terms "environmental audit" and "green audit" may have varied meanings depending on who you ask. Terms like "assessment," "survey," and "review" are commonly used to describe similar procedures. Furthermore, while some organizations/institutions feel that a "environmental audit" only looks at environmental concerns, others use the phrase to describe an assessment of health, safety, and environmental issues. Although there is no universally accepted definition of Green Audit, many notable organisations and institutions follow the main principle and approach summed up in the broad description provided by the International Chambers of Commerce (ICC) in its publication Environmental Auditing (1989).

The ICC defines Environmental Auditing as:

"*A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."*

The term "environmental audit" or "green audit" refers to an array of evaluations aimed at identifying implementation faults, environmental management system compliance issues, and related corrective activities. It attempts to investigate environmental activities on and off the subject areas that have an impact on the eco-friendly atmosphere. According to the World Bank, it is a systematic analysis of environmental data about an organisation, facility, or location to determine whether or not it meets predetermined environmental standards. Environmental rules might be based on regional, national, or global norms. In fact, it is a methodical procedure of collecting and interpreting environmental data.

1.2. NEED FOR GREEN AUDIT IN EDUCATIONAL INSTITUTIONS

Increased urbanisation and economic advancement have caused a slew of ecological and environmental issues at the local, regional, and global levels. The usage of resources such as water, electricity, and others has historically resulted in environmental degradation. It is vital that our lifestyle and resource management do not have a negative impact on the environment. Educational institutions regularly utilise large amounts of water, power, and other resources, resulting in the production of CO_2, waste, and energy and water loss, all of which can contribute to the worsening of local environmental sustainability. As environmental sustainability becomes a more pressing concern for the country, the role of educational institutions in addressing it grows in importance. As a result, educational institutions must establish a "Green Campus" strategy that encourages long-term expansion while effectively lowering atmospheric carbon dioxide levels.

Furthermore, the National Assessment and Accreditation Council (NAAC), New Delhi has mandated that all Higher Educational Institutions submit an annual Green Audit Report. Moreover, it is part of the Higher Educational Institutions' Corporate Social Responsibility to ensure that they contribute to the fight against global warming by reducing their carbon footprint. As a result, green auditing has become a mandatory requirement for all educational institutions.

1.3. BENEFITS OF GREEN AUDIT FOR EDUCATIONAL INSTITUTIONS

A green audit can help an educational institution understand how and where it uses the most energy, water, or other resources. The institution may then explore ways to improve and conserve. It may also be used to estimate waste quantity as well as type, which is useful for recycling operations and waste minimization plans. Green audits can increase environmental knowledge, morality, and ethical principles, as well as health awareness among students and faculty. It helps staff and students realise the advantages of being green on campus. Green auditing promotes cost savings by making use of fewer resources. It allows students and teachers to develop a sense of personal ownership and social responsibility. Therefore, it is vital that educational institutions assess their own contributions, responsibilities, and commitments to a sustainable future. Some of the advantages of green audits in educational institutions are listed below.

- More efficient resource management
- Provide basis for improved sustainability
- Provide a basis for development of green campus
- Enable waste management through reduction of waste generation, solid waste and water recycling
- Enable to create plastic free campus and evolve health consciousness among the stakeholders
- Enable determining cost saving methods through waste minimizing and managing
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Impart environmental education through systematic environmental management approach and improving environmental standards
- Assists in setting benchmarks for environmental protection initiatives
- Enable financial savings through a reduction in resource use
- Enhances the profiles of educational institutions
- Develops environmental ethic and value systems in students and staff
- Provides a valuable tool in the management and monitoring of environmental and sustainable development programs of educational institutions.

1.4. ABOUT CRITERIA 7 OF NAAC

Educational institutions are critical to the development of human resources around the world. Campuses of higher education institutions participate in a variety of activities to disseminate knowledge and its practical application throughout society. Higher education institutions also give a wide range of modern environmental solutions. Numerous evolutionary techniques are utilised to investigate environmental challenges. It includes topics such as Environmental Impact Assessments (EIA), Social Impact Assessments (SIA), Carbon Footprint Mapping, and Green Audits.

The National Assessment and Accreditation Council (NAAC) is a self-governing organisation that evaluates institutions based on assessments conducted during the accreditation process. Under NAAC Criterion VII, educational institutions are now required to conduct a Green Audit. The purpose of a green audit is to improve the institution's internal and external environment. To make the institution more environmentally friendly, waste management, energy conservation, air and noise monitoring, and water and wastewater accounting are used.

2. OBJECTIVES, GOALS AND SCOPE OF GREEN AUDIT

2.1. OBJECTIVES OF GREEN AUDIT

- To conduct a baseline survey to know the real status of green practices in the educational institution.
- To identify the problems faced while practising green practices in the educational institution campus.
- To examine current practises that has impact on the environment.
- To spread awareness for environmental consciousness amongst the students, teaching and non-teaching staff members.
- To identify and access environmental risk if any inside the institution campus.

2.2. GOALS OF GREEN AUDIT

- Establishing a baseline of existing environmental conditions with focus on natural and physical environment.
- Understanding the current practices of sustainability with regard to green campus.
- Awareness generation among students concerning real issues of environment and its sustainability through participatory auditing process.
- Development of strategies and action plans towards improving environmental quality for future.

2.3. SCOPE OF GREEN AUDIT

A clean and healthy environment promotes and facilitates learning. There are various programmes worldwide that address environmental education concerns. A green audit is the most effective and environmentally responsible approach to addressing environmental challenges. This type of professional care is the obligation of every individual involved in an economic, financial, social, or environmental component. Green audits should be performed on educational institution campuses since they help students realise the importance of environmental preservation and develop into responsible citizens. It also stipulates what tasks educational institutions must complete in order to become a green campus. Therefore, green audit is necessary at the institutional level of education.

3. ABOUT THE EDUCATIONAL INSTITUTION

3.1. A BRIEF HISTORY

Kamrup College was established on July 25, 1966 to meet the growing interest in education in the West Nalbari area, particularly in Chamata and nearby regions. Initially conducting classes at Chamata Higher Secondary School in the evening, the college later moved to its present campus in 1968. Since its founding, Kamrup College has been a hub for learning, showcasing the collaborative efforts of its founders and the local community to create a lasting impact on education in the region. Kamrup College, currently a provincialized institution under the Government of Assam, is recognized by the University Grants Commission (UGC) with a 12 (degree-granting) and 2 (postgraduate degree-granting) statuses. Affiliated with the Assam Higher Secondary Education Council for Higher Secondary level education and Gauhati University for undergraduate programs, the college received accreditation from the National Assessment and Accreditation Council (NAAC) in 2005 with a "B+" grade and in 2016 with an "A" grade. Initially offering only Arts, the college expanded to include the Science stream in 2022. Additionally, Kamrup College operates as a recognized study center for Krishna Kanta Handique State Open University through its Open and Distance Learning (ODL) wing.

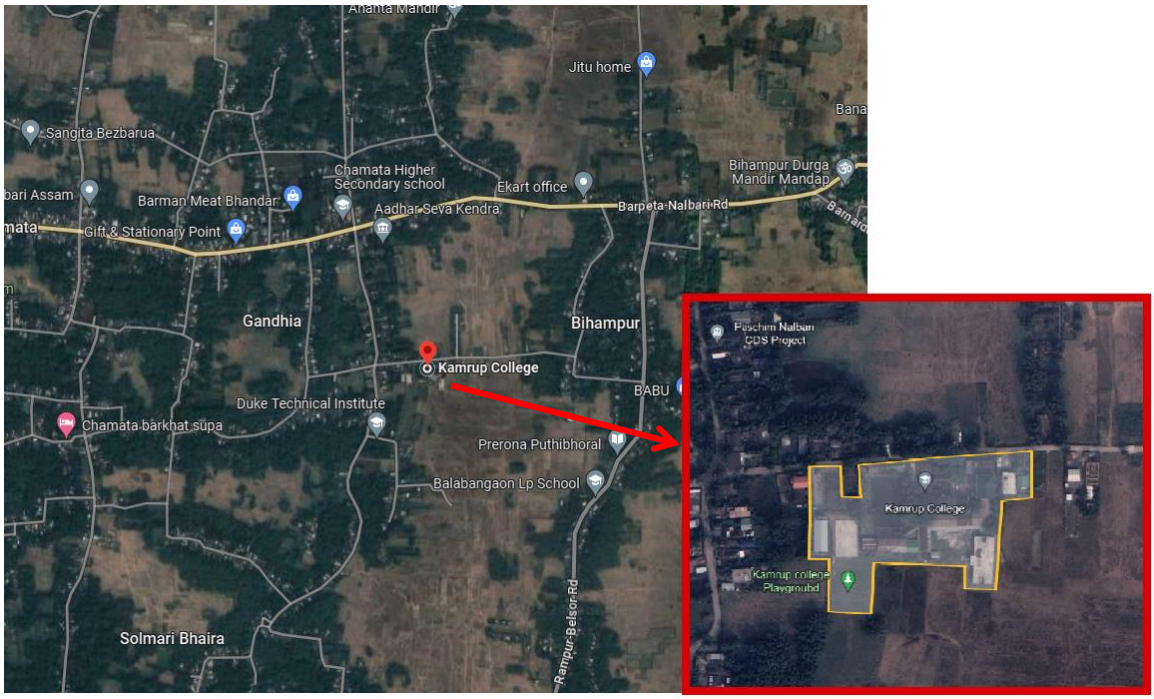


Photo 1: Location of Kamrup College (*Source: Google Earth*).

3.2. GEOGRAPHY

The college is located at a rural area of Chamata, Rupiabathan of Nalbari district. Its locational coordinates are 26°24'04" N and 91°20'56" E. The college is situated in the Lower Brahmaputra Valley zone at an elevation of 69m above sea level. The soil structure is mainly alluvial in nature. Vegetation found around the campus is a mixture of semi-evergreen trees, deciduous trees, and perennial grasses.

3.3. MOTTO, VISION, AND MISSION OF THE INSTITUTION

3.3.1. MOTTO OF THE INSTITUTION

- To add to one's knowledge, to foster the competitive spirit, and to institute a positive societal change.

3.3.2. VISION OF THE INSTITUTION

- Kamrup College, Chamata envisions both academic and professional excellence. With proper consideration for human values, the college is committed to provide an abundance of opportunities to students to develop their interpersonal and leadership abilities in this setting. The promotion of national unity, harmony, and secularism is made possible through the comprehensive development of the individual. Additionally, the college wants to promote the pursuit of excellence and instil a sense of civic responsibility in its students. Along with providing quality education, Kamrup College, Chamata also provides the students with value-based education that would help them to uplift themselves along with the society.

3.3.3. MISSION OF THE INSTITUTION

- The mission of the college is to create awareness and interest for higher education among the people in the rural proximity, and spread female literacy in particular, thereby enabling all to lead an enlightened life marked by all round development of the society. Kamrup College, Chamata also wants to make itself a key player in the area by focusing on imparting skills to students for optimum human resource development, in addition to creating a platform for meritorious students to aim for higher pursuits of learning.

3.4. GENERAL INFORMATION

3.4.1. COLLEGE CAMPUS

The college campus extends over 39 bighas of land, bordered by Kamrup College of Education on one side. The campus includes 5-6 Assam type blocks along with 4-5 RCC buildings housing the Principal's office, Teachers' common rooms, Departments, IQAC room, classrooms, library, laboratories, students' common room, well equipped conference rooms and an indoor sports complex. There are also separate hostels for boys and girls in the college campus. The canteen is in a separate two-storeyed building within the college campus.

Photo 2: Campus of Kamrup College.

3.4.2. FACILITIES

Classroom

The college is equipped with 25 well-maintained classrooms for conduction of regular classes and has 2 well-equipped Digital Classrooms for academic purpose.

Laboratories

Kamrup College features specialized facilities for academic departments, including a sophisticated language lab for English, a psychological lab for Education, and a historical

archive for History. The computational lab serves the computational needs of Mathematics and Physics departments. All science stream departments are equipped with labs for practical and hands-on classes, enhancing the overall learning experience at the college.

Library

The college's commitment to achieving excellence in higher education and research is bolstered by a well-equipped library named Gaurikanta Talukdar Library. The library is fully computerized with internet access through INFLIBNET (SOUL 2.0 service) and is currently undergoing digitalization, incorporating features such as barcode scanning for book issuance and return. With a collection of 37,551 books covering diverse topics, the library also subscribes to a minimum of 20 regular journals, 7 daily newspapers, and various magazines. Open on all working days during college office hours, the library offers a comprehensive resource for academic pursuits. Additionally, the Late Gaurikanta Talukdar Memorial Award is presented to the best library user, sponsored by Mr. Lohit Talukdar. The library at Kamrup College is registered on the National Library and Information Services Infrastructure for Scholarly Content (NLIST) program's database, providing users with access to a diverse range of e-books, e-journals, and more through NLIST.

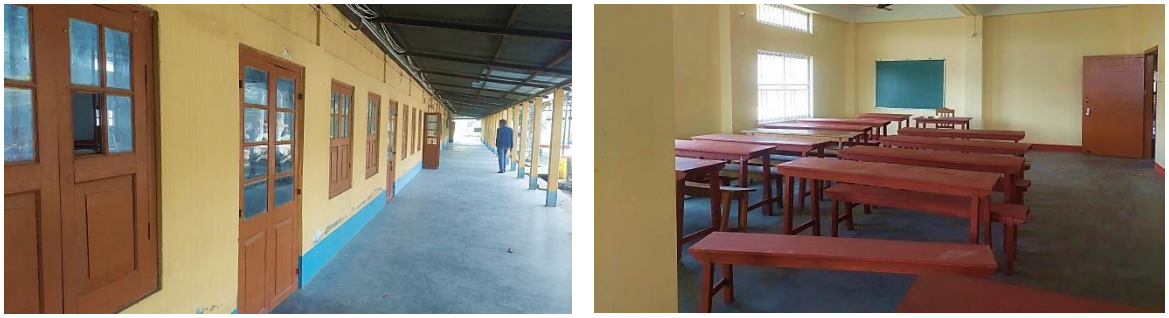


Photo 3: Classrooms of Kamrup College.

Photo 4: Laboratories of Kamrup College

Photo 5: Library of Kamrup College.

Common rooms for teachers and students

The college provides dedicated rooms for teachers in each academic department, ensuring a focused and organized learning environment. These rooms are equipped with departmental libraries and wall magazines, fostering a conducive atmosphere for academic exploration. Furthermore, separate common rooms are available for both boys and girls, equipped with ample facilities for recreation and entertainment.

Games and Sports Facilities

The college is equipped outdoor sports facilities, including a football ground, a volleyball court and a basketball court. The College encourages students to take part in games and sports at various levels and gives financial support whenever found necessary.


Photo 6: Outdoor Sports Facilities of Kamrup College.

Conference Room and Auditorium

The college has a well-equipped conference, known as Community Hall. It has a seating capacity to accommodate 300 audience members at once.

Hostel

There is a hostel for girls in the college campus. However, due to low admissions to the hostel, the building is utilized for science departments and laboratories.


Photo 7: Conference Room and Auditorium of Kamrup College.

Canteen Facility

The college has an established college canteen in a separate building within the campus.

3.4.3. COURSES AND DEPARTMENTS

The College offers the following programmes:

Higher Secondary Programme

Higher Secondary in Arts	Higher Secondary in Commerce

Under-Graduate Programme in a Stream

Programme	Subjects
Bachelor of Science (Honours)	Physics, Mathematics, Chemistry, Zoology, and Botany
Bachelor of Science (Regular)	Offered with a combination of subjects
Bachelor of Arts (Honours)	Assamese, Arabic, English, Education, Economics, History, Political Science, Philosophy, Sanskrit, and Mathematics.
Bachelor of Arts (Regular)	Offered with a combination of subjects

Short-Term Courses / Add-on Courses

Offers various short term courses like Certificate in CCA, DCA, Cutting & Tailoring, Spoken Sanskrit, Spoken English, Spoken Arabic

Departments

Department of Assamese	Department of Arabic
Department of Economics	Department of Education
Department of English	Department of History
Department of Political Science	Department of Mathematics
Department of Sanskrit	Department of Philosophy
Department of Chemistry	Department of Botany
Department of Zoology	Department of Physics

3.5. PREVIOUS GREEN AUDIT

The previous green audit of Kamrup College was conducted for the year 2015-2016 by Green Globe, a NGO based in Nalbari.

4. METHODOLOGY

A green audit has three phases - pre-audit stage, audit stage and post-audit stage, accordingly the audit was conducted.

4.1. PRE AUDIT STAGE

A pre-audit meeting gave an opportunity to reiterate the scope and objectives of the audit, and pre-audit discussions were undertaken to identify the auditing targets. This meeting is essential for the green audit since it provides the first opportunity to comprehend the concerns. It was held with the college's concerned officials, and target areas were established, as well as the audit protocol and audit plan were handed over and discussed prior to the audit. The pre-audit meeting was conducted successfully and necessary documents were collected directly from the college before the initiation of the audit processes. Accordingly, as per the request of the college authority the following target area was identified for the audit:

- **Green Campus (Biodiversity)**

4.2. AUDIT STAGE

The following processes were involved during the audit stage:

4.2.1. DATA COLLECTION

In the data collection phase, exhaustive data collection is performed using different tools such as observation, questionnaire survey, physical inspection of the campus, review of the documentation, and interviewing key persons. A mixture of open ended and closed ended questionnaires were developed and used for data collection. Meetings with relevant stakeholders identified in the pre-audit stage were held to obtain the necessary information. Detailed discussions on some specific topic were also held.

Survey by Questionnaire

A questionnaire survey was used to collect baseline data for the preparation of the green audit report. Questionnaires for conducting the green audit on the college campus have been designed based on rules, regulations, laws, and formats provided by the Central Pollution Control Board, the Ministry of Environment, Forests, and Climate Change in New Delhi, and other statutory organisations. The questionnaire featured general information about the

college, as well as information about the college's biodiversity and green campus management.

Review of documents, records and policies

This was carried out to better comprehend the college's different activities aimed at preserving and improving the environment. Data was acquired from documents like activity reports, plantation lists, biodiversity registers, and photographs.

Site Inspection

The audit team also visited the various sections in its premises in order to have an idea of campus flora and fauna as well as various activities carried out in the campus pertaining to biodiversity and development of green campus. The present condition of the site is also checked with the help of the questionnaires. Campus greenery and gaps were identified. Personal observations were made during the onsite visit.

4.2.2. DATA ANALYSIS

A proper analysis is a critical component of the green audit. The data required for the analysis is extracted from the collected data and tabulated for ease of data accessibility. Detailed analysis of the data collected include: documentation of biodiversity in the campus as well as the green initiatives taken by the college.

4.3. POST AUDIT STAGE

The post-audit stage ensures formulation of draft findings and placing it before the authority for final response. Since the audit is done, it was important to ensure college authority's approval for the draft. After getting draft approval, the audit team went for final report formulation. The post audit phase involved the following components:

- ✓ Identification of available biodiversity (flora and fauna) in the college campus
- ✓ Identification of the best practices followed by the institution
- ✓ Compiling a report of the data collected
- ✓ Distributing the report and declaration/certificate to the institution

5. GREEN CAMPUS (BIODIVERSITY) AUDIT

5.1. OPEN AREA

Along with the built-up area of 11.16 acre (total land), the college campus offers roughly 6.44 acre of open space and build up area of 4.72 acre. The auditing team observed that the college authority had made an attempt to preserve the open space in as natural of a state as feasible. These include garden, open playground, and one pond. The open region, which consists primarily of open ground and garden is covered in grass and other vegetation, promotes natural water percolation, which is a crucial ecological mechanism for replenishing the groundwater level.


Photo 8: Open-area playground and pond of Kamrup College.

5.2. CAMPUS FLORA

The college has meticulously initiated extensive plantation drives, transforming the campus into a vibrant, green sanctuary teeming with a varied spectrum of floral biodiversity. During the audit a total of 48 species under 46 genera and 34 families has been enumerated. Species occurrence was highest from the Asteraceae family with 4 species, followed by Poaceae and Fabaceae, and Lamiaceae with 3 species each. Out of the 48 species, 5 species remained unidentified; however, their family name is identified and listed. A list of plant species enumerated in the campus is given as follows.

Table 1: Floral species enumerated in the college campus along with their family, common name, and IUCN status.

Sl. No.	Plant species	Family	Common Name	IUCN Status
1	*Acmella uliginosa* (Sw.) Cass.	Asteraceae	Marsh para cress	Least Concern
2	*Adenanthera pavonina* L.	Fabaceae	Red Sandalwood Tree	Near Threatened
3	*Ageratum conyzoides* L.	Asteraceae	Tropical Whiteweed	Not Evaluated
4	*Aloe vera* (L.) Burm	Asphodelaceae	Aloe Vera	Not Evaluated
5	*Araucaria* sp.	Araucariaceae	-	-
6	*Areca triandra* Roxb. ex Buch.-Ham.	Arecaceae	Wild Areca Palm	Least Concern
7	*Axonopus fissifolius* (Raddi) Kuhlm.	Poaceae	Carpet Grass	Not Evaluated
8	*Catharanthus roseus* (L.) G.Don	Apocynaceae	Madagascar Periwinkle	Not Evaluated
9	*Centella asiatica* (L.) Urb.	Apiaceae	Asiatic Pennywort	Least Concern
10	*Colocasia esculenta* (L.) Schott	Araceae	Wild Taro	Least Concern
11	*Cynodon dactylon* (L.) Pers.	Poaceae	Bermuda Grass	Not Evaluated
12	*Delonix regia* (Bojer ex Hook.) Raf.	Fabaceae	Flame Tree	Least Concern
13	*Dianthus chinensis* L.	Caryophyllaceae	China Pink	Not Evaluated
14	*Digitaria* sp.	Poaceae	-	-
15	*Dracaena trifasciata* (Prain) Mabb.	Asparagaceae	Snake Plant	Not Evaluated
16	*Epipremnum aureum* (Linden & André) G.S.Bunting	Araceae	Devil's Ivy	Not Evaluated
17	*Euphorbia pulcherrima* Willd. ex. Klotzsch	Euphorbiaceae	Poinsettia	Least Concern
18	*Evolvulus alsinoides* L.	Convolvulaceae	Dwarf Morning Glory	Not Evaluated
19	*Ficus benghalensis* L.	Moraceae	Banyan	Not Evaluated
20	*Ficus religiosa* L.	Moraceae	Sacred Fig	Least Concern
21	*Hibiscus rosa-sinensis* L.	Malvaceae	Chinese Hibiscus	Not Evaluated
22	*Hydrocotyle sibthorpioides* Lam.	Araliaceae	Lawn Marshpennywort	Least Concern
23	*Impatiens balfourii* Hook.f.	Balsaminaceae	Balfour's Touch-me-not	Not Evaluated
24	*Impatiens hawkeri* W.Bull	Balsaminaceae	New Guinea Impatiens	Not Evaluated
25	*Ixora coccinea* L.	Rubiaceae	Jungle Geranium	Not Evaluated
26	*Leucas aspera* (Willd.) Link	Lamiaceae	Common Leucas	Not Evaluated
27	*Melia azedarach* L.	Meliaceae	Chinaberry	Least Concern
28	*Mesua ferrea* L.	Calophyllaceae	Ceylon Ironwood	Not Evaluated
29	*Mimosa pudica* L.	Fabaceae	Touch-me-not	Least Concern
30	*Mimusops elengi* L.	Sapotaceae	Indian Medlar	Least Concern
31	*Monoon longifolium* (Sonn.) B.Xue & R.M.K.Saunders	Annonaceae	False Ashoka	Not Evaluated
32	*Murraya paniculata* (L.) Jack	Rutaceae	Orange Jasmine	Not Evaluated
33	*Ocimum tenuiflorum* L.	Lamiaceae	Holy Basil	Not Evaluated
34	*Oxalis corniculata* L.	Oxalidaceae	Creeping Woodsorrel	Not Evaluated
35	*Petunia* sp.	Solanaceae	-	-
36	*Phyllanthus emblica* L.	Phyllanthaceae	Indian Gooseberry	Least Concern
37	*Polyscias* sp.	Araliaceae	-	-
38	*Psidium guajava* L.	Myrtaceae	Guava	Least Concern
39	*Punica granatum* L.	Lythraceae	Pomegranate	Least Concern
40	*Rhynchostylis retusa* (L.) Blume	Orchidaceae	Foxtail Orchid	Not Evaluated
41	*Rosa indica* L.	Rosaceae	Rose	Not Evaluated
42	*Rostellularia diffusa var. prostrata* (Roxb. ex C.B.Clarke) J.L.Ellis	Acanthaceae	-	Not Evaluated

Sl. No	Species	Family	Common Name	IUCN Status
43	*Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult.	Apocynaceae	Pinwheel flower	Least Concern
44	*Tagetes erecta* L.	Asteraceae	Aztec Marigold	Not Evaluated
45	*Tectona grandis* L.f.	Lamiaceae	Teak	Endangered
46	*Terminalia chebula* Retz.	Combretaceae	Chebulic Myrobalan	Least Concern
47	*Xanthium* sp.	Asteraceae	-	-
48	*Ziziphus mauritiana* Lam.	Rhamnaceae	Indian Jujube	Least Concern

A graph representing No. of floral species, genera and family enumerated in the college campus during audit is given below.

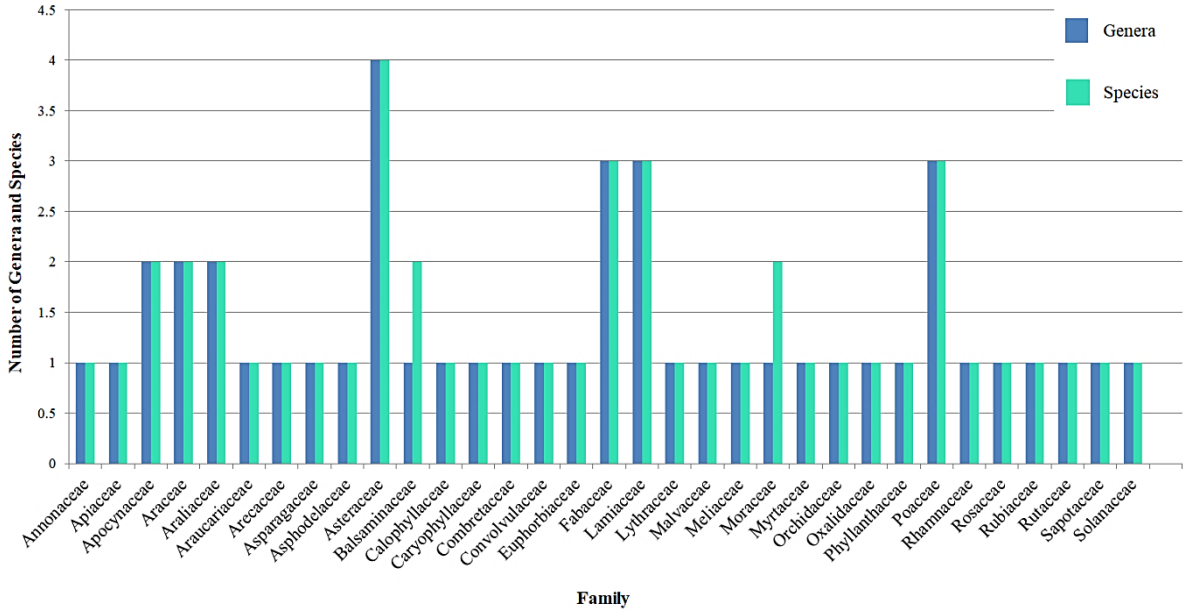


Figure 1: No. of floral species, genera and family enumerated in the college campus during audit.

Evaluation of IUCN status of the plants listed above showed that most of the species are "Not Evaluated" (24 species), followed by 17 species falling under the "Least Concern" category. However, the college houses species that is "Near Threatened" (1 species) as well as "Endangered" (1 species). 5 species couldn't be categorised into any one of the IUCN Red List Category as the species remained unidentified. A pie-chart showing the above mentioned data is given as follows:

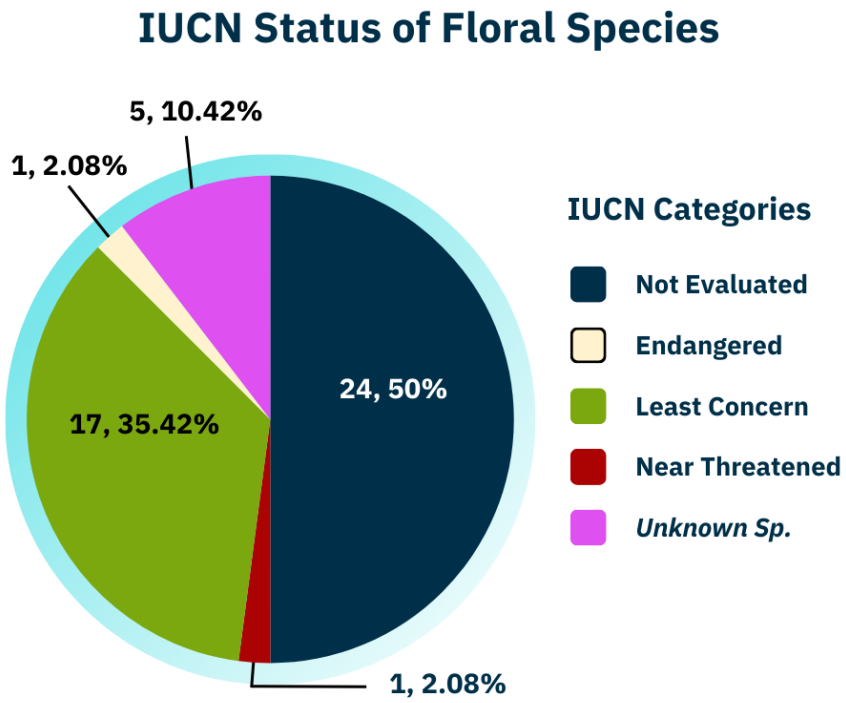
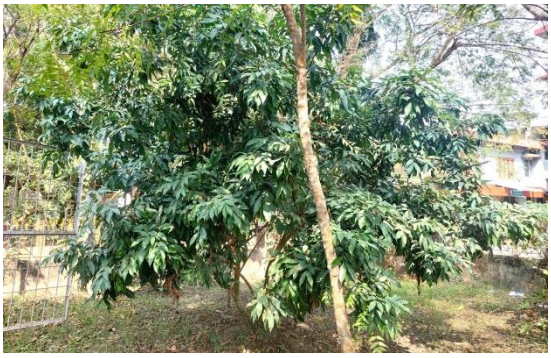


Figure 2: IUCN status of the floral species enumerated in the college campus during audit.



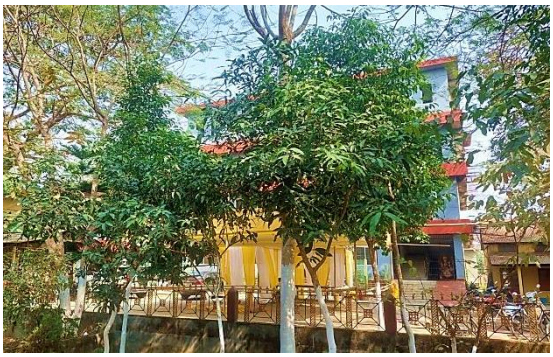


Photo 9: A few of the plant species enumerated in the college campus during the audit.

5.3. CAMPUS FAUNA

Numerous faunal species are frequently observed in the campus, including mammals, birds, amphibians, reptiles, etc. The vegetation in the campus acts as the adobe for the faunal species present in the college campus. A list of faunal species in the campus is given as follows.

Table 2: Faunal species in the college campus along with their class, order, family, and common and vernacular name.

Sl. No.	Faunal species	Class	Order	Family	Common / Vernacular Name
1	*Acridotheres tristis*	Aves	Passeriformes	Sturnidae	Common Myna
2	*Anabas testudineus*	Actinopterygii	Persiformes	Anabantidae	Climbing Perch
3	*Apis dorsata*	Insecta	Hymenoptera	Apidae	Giant Honey Bee
4	*Apogonia ferruginea*	Insecta	Coleoptera	Scarabaeidae	Dung beetle
5	*Ariolimax* sp	Gastropoda	Stylommatophora	Arionidae	Banana slug
6	*Calotes versicolor*	Mammalia	Squamata	Agamidae	Garden Lizard
7	*Camponotus* sp	Insecta	Hymenoptera	Formicidae	Carpenter ant
8	*Canis lupus familiaris*	Mammalia	Carnivora	Canidae	Dog
9	*Catla catla*	Actinopterygii	Cypriniformes	Labeoninae	Catla Fish
10	*Ceriagrion coromandelianum*	Insecta	Odonata	Coenagrionidae	Coromandel Marsh Dart
11	*Chanda nama*	Actinopterygii	Perciformes	Ambassidae	Elongate Glassy Perchlet
12	*Channa punctata*	Actinopterygii	Anabantiformes	Channidae	Spotted Snakehead
13	*Chitala chitala*	Actinopterygii	Osteoglossiormes	Notopteridae	Clown Knifefish
14	*Cirrhinus cirrhosus*	Actinopterygii	Cypriniformes	Cyprinidae	Mrigal Carp
15	*Corvus splendens*	Aves	Passeriformes	Corvidae	House Crow
16	*Culex* sp	Insecta	Diptera	Culicidae	Mosquito
17	*Dendrocitta vagabunda*	Aves	Passeriformes	Corvidae	Rufous Treepie
18	*Drosophila melanogaster*	Insecta	Diptera	Drosophilidae	Common Fruitfly
19	*Dytiscus marginalis*	Insecta	Coleoptera	Dytiscidae	Great Diving Beetle
20	*Eurema hecabe*	Insecta	Lepidoptera	Pieridae	Common Grass Yellow
21	*Hemidactylus frenatus*	Reptilia	Squamata	Gekkonidae	Common House Gecko
22	*Hoverfly* sp	Insecta	Diptera	Syrphidae	Hoverfly
23	*Indoplanorbis exustus*	Gastropoda	Hygrophila	Planorbidae	Ram's Horn Snail
24	*Ischnura aurora*	Insecta	Odonata	Coenagrionidae	Golden Dartlet
25	*Junonia almana*	Insecta	Lepidoptera	Nymphalidae	Peacock Pansy
26	*Junonia atlites*	Insecta	Lepidoptera	Nymphalidae	Grey Pansy
27	*Junonia lemonias*	Insecta	Lepidoptera	Nymphalidae	Lemon Pansy
28	*Labeo rohita*	Actinopterygii	Cypriniformes	Cyprinidae	Rohu Fish
29	*Lamellidens* sp	Bivalvia	Unionida	Unionidae	-
30	*Lathrecista asiatica*	Insecta	Odonata	Libellulidae	Asiatic Blood Tail
31	*Leptoptilos dubius*	Aves	Ciconiiformes	Ciconiidae	Greater Adjutant Stork

Sl. No.	Faunal species	Class	Order	Family	Common / Vernacular Name
32	*Lissachatina fulica*	Gastropoda	Pulmonata	Achatinidae	Giant African Land Snail
33	*Lymnea* sp	Gastropoda	Pulmonata	Lymnaeidae	Pond Snails
34	*Macaca mulatta*	Mammalia	Primates	Cercopithecidae	Rhesus Macaque
35	*Macrobrachium* sp	Malacostraca	Decapoda	Palaemonidae	Freshwater Prawn
36	*Macrochlamys* sp	Gastropoda	Stylommatophora	Ariophantidae	-
37	*Mole cricket* sp	Insecta	Orthoptera	Gryllotalpidae	Mole cricket
38	*Musca domestica*	Insecta	Diptera	Muscidae	Housefly
39	*Nandus nandus*	Actinopterygii	Perciformes	Nandidae	Gangetic Leaffish
40	*Neoconocephalus* sp	Insecta	Orthoptera	Tettigoniidae	Katydids
41	*Neurothemis intermedia*	Insecta	Odonata	Libellulidae	Paddyfield Parasol
42	*Oecophylla smaragdina*	Insecta	Hymenoptera	Formicidae	Red Weaver Ant
43	*Orthetrum pruinosum*	Insecta	Odonata	Libellulidae	Crimson-Tailed Marsh Hawk
44	*Pantala flavescens*	Insecta	Odonata	Libellulidae	Wandering glider
45	*Papilio demoleus*	Insecta	Lepidoptera	Papilionidae	Lime Swallowtail
46	*Papilio polytes*	Insecta	Lepidoptera	Papilionidae	Indian Common Mormon
47	*Picus* sp	Aves	Piciformes	Picidae	Woodpecker
48	*Pieris canidia indica*	Insecta	Lepidoptera	Pieridae	Asian Cabbage White
49	*Pila globosa*	Gastropoda	Architaenioglossa	Ampullariidae	Apple Snail
50	*Polistes olivaceus*	Insecta	Hymenoptera	Vespidae	Yellow oriental Paper Wasp
51	*Psittacula krameri*	Aves	Psittaculid ae	Psittaculidae	Rose-ringed Parakeet
52	*Pteropus medius*	Mammalia	Chiroptera	Pteropodidae	Greater Indian Fruit Bat
53	*Puntius sophore*	Actinopterygii	Cypriniformes	Cyprinidae	Pool Barb
54	*Rattus* sp	Mammalia	Rodentia	Muridae	Rat
55	*Rhyothemis variegata*	Insecta	Odonata	Libellulidae	Common Picturewing
56	*Leptocorisa* sp	Insecta	Hemiptera	Alydidae	Rice Bug
57	*Sartoriana spinigera*	Malacostraca	Decapods	Gecarcinucidae	Wood Mason Crab
58	*Short horned grasshopper*	Insecta	Orthoptera	Acrididae	Short Horned Grasshopper
59	*Tarbinskiellus portentosus*	Insecta	Orthoptera	Gryllidae	Rice field cricket
60	*Trichogaster fasciata*	Actinopterygii	Anabantiformes	Osphronemidae	Striped Gourami
61	*Trithemis festiva*	Insecta	Odonata	Libellulidae	Black Stream Glider
62	*Vespa affinis*	Insecta	Hymenoptera	Vespidae	Lesser Banded Hornet
63	*Xylocopa* sp	Insecta	Hymenoptera	Apidae	Carpenter Bee
64	*Zizeeria karsandra*	Insecta	Lepidoptera	Lycaenidae	Dark Grass Blue

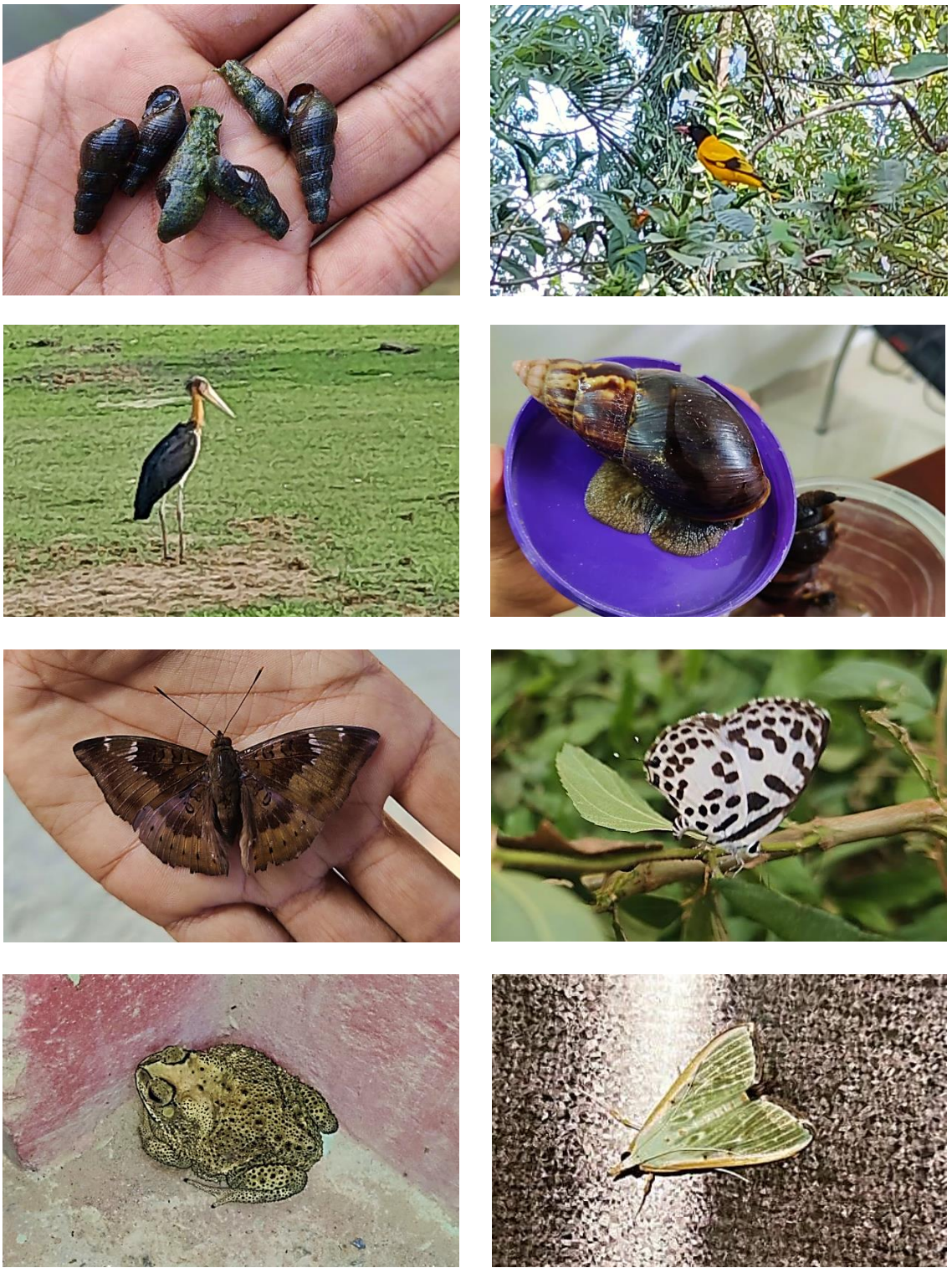


Photo 10: Faunal diversity of Kamrup College.

5.4. BEST PRACTICES PERTAINING TO GREEN CAMPUS

The institution has been involved in a range of environmental programmes as part of its continued commitment to preserving a green campus. Planting and nurturing trees, maintaining garden on campus, organising campus-wide clean-up efforts, and celebrating environmentally important days. To further strengthen these efforts, the college has established a Green Club and a College Environment and Climate Cell (Funded by ASTE Council), reflecting its dedication to fostering environmental consciousness and sustainable practices. The college is set to enhance its green cover through collaboration with Daffodils Nursery, which is in the pipeline to develop a Green Campus and herbal garden. This marks a significant step towards fostering sustainability and biodiversity within the college premises.

5.4.1. PLANTATIONS

The Kamrup College administration promotes environmental protection and organises tree planting programmes on the Kamrup College campus on World Environment Day and other occasions every year. The programmes involve students as well as members of the teaching and non-teaching faculties. Individual students and teachers with whom the audit team interacted were aware of and interested in campus flora care. The campus flora serves a variety of tasks, including improving the quality of the surrounding natural environment, attracting more species, particularly birds, and increasing its habitat, as well as improving the area's water quality. The following are the occasions and dates on which the college held plantation programmes in 2022-23:

Table 3: Plantation programmes organised by the college in 2022-23.

Plantation Programmes organised by the College in 2022-23

Sl. No	Date	Occasion
1	14/05/2022	Seuj Saptah
2	18/07/2022	Chief Minister’s Institutional Plantation Programme (CMIPP)
3	23/03/2023	Mission LiFE
4	22/05/2023	International Day for Biological Diversity
5	05/06/2023	World Environment Day 2023
6	17/09/2023	Amrit Brikshya Andolon

In the 2022-2023 academic session, Kamrup College demonstrated a strong commitment to environmental sustainability. The institution planted 2150 trees on campus, enhancing its green cover. Additionally, 1000 saplings were distributed, encouraging the community to participate in the eco-friendly initiative. These efforts reflect the college's dedication to creating a sustainable and environmentally conscious campus for the well-being of its community and the broader environment.

Photo 11: Plantation programmes organised by Kamrup College during 2022-2023.

5.4.2. PLANS FOR DEVELOPMENT OF BOTANICAL GARDEN

Looking towards a greener and more biodiverse future, Kamrup College has ambitious plans to develop a botanical garden on its campus. This forward-thinking initiative aims to not only enhance the green cover but also promote high biodiversity within the college grounds. The botanical garden will serve as an educational and recreational space, fostering a deeper connection between the college community and nature.

5.4.3. CAMPUS CLEANLINESS

The campus of Kamrup College is cleaned on a daily basis. The cleanliness is also maintained through cleanliness drives and strategically placed dustbins around the entire campus.

5.4.4. AWARENESS ON GREEN CAMPUS (BIODIVERSITY) AND RELEVANT ISSUES

The College has undertaken several initiatives in creating awareness among the students as well as among people of the locality on the importance of biodiversity and its conservation. Some of the initiatives include:

- The Department of Economics and Education celebrated Earth Day, 2023 with a collaborative event, promoting awareness and sustainable practices within the academic community on 22/04/2023.
- The college marked World Water Day, 2023 with a celebratory event, emphasizing the importance of water conservation and raising awareness about sustainable water practices.
- The Department of Zoology, Kamrup College celebrated International Biological Diversity Day in 2023, organizing events to highlight the significance of biodiversity conservation.
- The Extension Education Cell at Kamrup College observed Swastha Abhiyan through a dedicated cleanliness drive at community Shiv Mandir, Rupiabathan, Chamata on 29/01 2022 promoting a healthy and hygienic environment for all.
- The College's Environment and Climate Cell undertaken Green Campus Challenge on the theme "Care Compete Clean" on the occasion of World Environment Day 2023 on 05/06/2022.

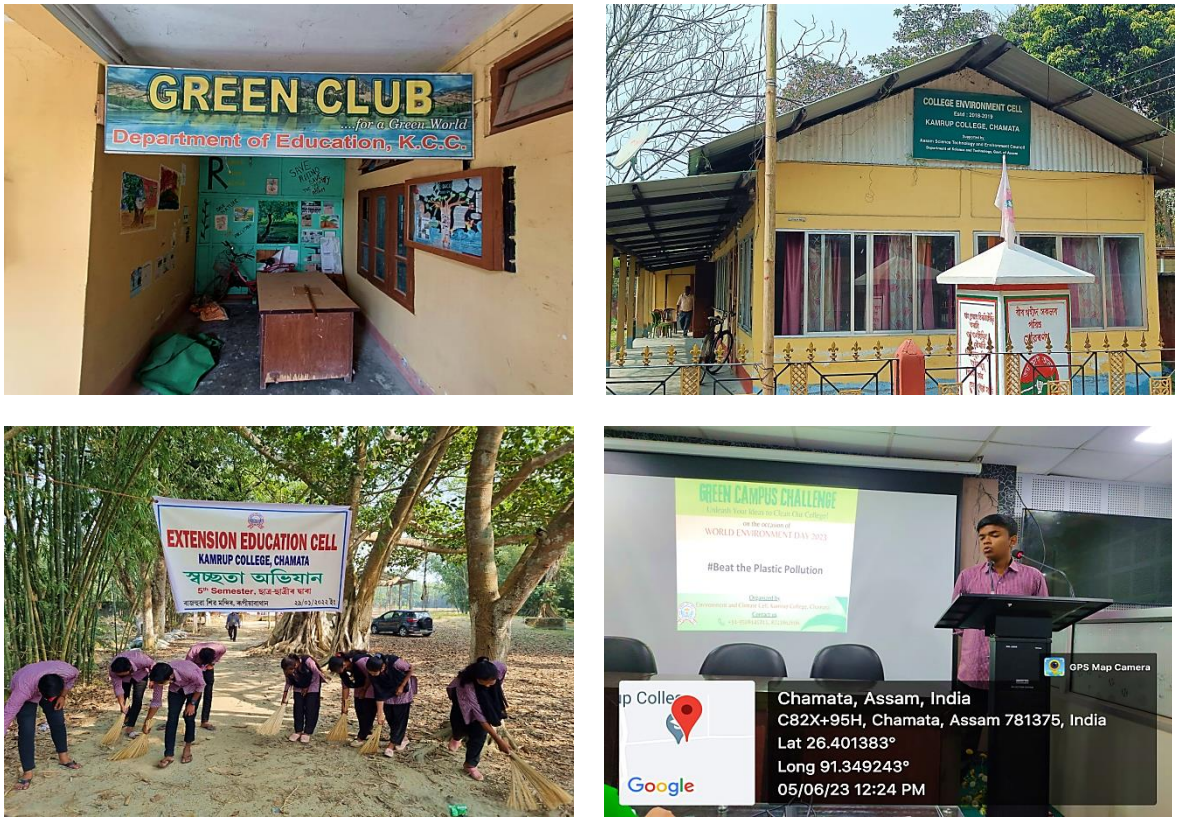


Photo 12: Various awareness programmes conducted by Kamrup College on Green Campus (biodiversity) and relevant issues.

6. RECOMMENDATIONS

Based on the visit and discussions with college authority officials, the audit team concluded that the institution required a future road map to increase its efforts in adopting a green and clean approach while also demonstrating a commitment to the environment and nature. Furthermore, it is recommended that the college administration maintain this routine for executing environmental and green audits, as the audit team believes that doing so will raise awareness and encourage engagement among faculty, staff, and students, and that the positive trend will continue over time. The audit team has also made the following recommendations:

1) The college may prioritise planting indigenous fruit-producing plants such as *Baccaurea ramiflora* (লেটেকু), *Flacourtia jangomas* (পনিয়ল), and *Averrhoa carambola* (কৰ্দৈ), etc. instead of other plant species to enhance the college's faunal diversity. The college can also create, improve, and preserve habitat for lepidopterans such as butterflies, skippers, and moths by establishing a butterfly garden with local blooming plant species.
2) During the audit, it was discovered that several tree species on campus had not been correctly tagged. It is therefore recommended that all of the trees and plants on campus be properly and correctly tagged with permanent nameplates reflecting their scientific and local names. If feasible, their taxonomic classification should also be stated.
3) The college can also implement a "QR Codes for Plant" initiative in which QR codes are posted next to each plant and, when scanned, the user gains access to further information on the plant. This might be developed in-house by the college or using openly available applications. This effort would aid in the development of students' scientific temperament, allowing them to learn more about the flora of their neighbourhood, district and state, as well as understand the environment and ecology.
4) It is suggested that the college intensify their plantation initiatives and use species of plants that are locally available and provide economic benefits to the community. Whenever such plantation drives are held, the college must keep track of the plant types and quantities planted, as well as the individuals who planted them.
5) It is also recommended to develop an orchidarium to conserve wild orchid species. The cultivation of native species may be increased, and exotic species could be collected and introduced to boost their numbers, facilitating their conservation.

6) It is also recommended that the college may develop a medicinal garden with important medicinal plant species and maintain a database on their species, scientific classifications, diseases treatable by them, and their medicinal use.
7) It is highly recommended to establish a vermicomposting unit within the campus for effective waste management and environmental sustainability. This initiative would not only help in recycling organic waste but also provide nutrient-rich compost for landscaping and gardening purposes. The vermicomposting unit aligns with the college's commitment to eco-friendly practices, fostering a greener, sustainable campus.
8) The college has an excellent potential to capture rainwater from the rooftops of campus buildings, which the college management can use for a variety of purposes. The college can decide to develop extensive rainwater harvesting infrastructures on building roofs in a phased manner. This will enable the future Green Audit team to compare the advancements accomplished by the college administration.
9) The audit team recommend the prohibition of single-use plastic in the campus to promote environmental responsibility and reduce the ecological impact of plastic waste.
10) It is recommended to implement a comprehensive e-waste management system on the college campus to ensure the proper recycling of electronic waste.
11) To enhance environmental awareness, the audit team recommends the naming of buildings and classrooms with bird names, national parks, wildlife sanctuary and river names of Assam in the campus, creating a unique and educational atmosphere that reflects a commitment to biodiversity conservation.
12) It is also recommended to observe one day of the week as a “No Motor Vehicle Day” in the campus. This would help the college to significantly reduce the emission of carbon as well as reduce the carbon footprint of the college.
13) It is recommended that the college establish an Environmental Management System (EMS) to oversee all environment-related operations. The EMS will serve as an internal audit team, assisting external audit officers on future audits. Along with the college's teaching and non-teaching staff, students will serve as volunteer members of the EMS.
14) An environmental policy paper must be prepared and developed, which will include all of the recommendations, the college's present practices, and a roadmap and action plan for implementing the recommendations within a certain time frame. This policy will be revised following each green audit, and the college will follow it to make the campus more environmentally sustainable. To be considered comprehensive, the policy must include the overall environmental vision, mission, goals, and objectives.

7. CONCLUSION

The green audit is an important instrument for ensuring that natural resources are handled ethically and equitably. Green audits are essential for analysing and assessing whether institutional practices are sustainable and environmentally responsible. It is a methodical approach to finding, quantifying, documenting, reporting, and monitoring biological and environmental components in a given area. A green audit's two primary goals are to investigate the college's green practices and conduct a thorough audit to determine whether the institution is on the right road for long-term success.

The audit team feels that faculty members, support office personnel, and students all share a strong sense of responsibility for the environment. The audit team opines that the environment is well-maintained throughout the college campus, and authorities have been observed to be particularly concerned with the college's overall appearance and cleanliness. Several of the audit team's findings may help the college campus become greener and more environmentally friendly. Along with the findings, recommendations are presented for the college administration to implement.

Based on the inspection and discussions with college authority officials, the audit team concluded that the institution need a plan of action and a future road map to strengthen its efforts in adopting a green and clean approach while also exhibiting a commitment to the environment and ecosystem. Furthermore, it is suggested that the college administration maintain this routine of carrying out green audits, as the audit team believed that doing so would raise awareness and promote participation among students, employees, and faculty, and that the positive trend would continue to grow over time.