2023-2024

# GREEN AUDIT REPORT

## OF

# KALIABOR COLLEGE

Kuwaritol, Kaliabor, Nagaon


**AUDIT COMPONENT:**

GREEN CAMPUS (BIODIVERSITY) AUDIT

PREPARED BY

ASSAM SCIENCE TECHNOLOGY AND ENVIRONMENT COUNCIL
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অসম বিজ্ঞান প্রযুক্তিবিদ্যা আৰু পৰিৱেশ পৰিষদ
(বিজ্ঞান, প্রযুক্তি আৰু জলবায়ু পৰিৱর্তন বিভাগ, অসম চৰকাৰ)
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No. ASTEC/ENV/2161/2023/19 Dated: 03/01/2025

# DECLARATION

It is hereby declared that Assam Science Technology and Environment Council (ASTEC) have conducted a **"Green Audit"** for **Kaliabor College** on **20th December 2024** for the academic year 2023-2024. 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: 03/01/2024
Place: Guwahati

Director
ASTE Council

# ACKNOWLEDGEMENT

The green audit team of Assam Science Technology and Environment Council (ASTEC) express our sincere gratitude to Kaliabor College, Kuwaritol, Nagaon, 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. Uttam Kr. Baruah, Principal, and faculty members Dr. Rijib Borah, Dr. Barnali Kakati, Dr. Pradip Mochahary, Dr. Dipankar Borah, Mr. Chiranjeev Bezbaruah, Dr. Basistha Kalita, IQAC committee members and other associate staff of Kaliabor 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)

| Sl. No | Name | Designation | Audit Role | Signature |
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| 1 | Mr. Manish Kuntal Buragohain | Project Scientist, Climate Cell, Environment Division, ASTEC | Green campus (Biodiversity) Audit Officer | 03/01/2025 |
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# EXECUTIVE SUMMARY

Environmental development is viewed as an essential component in educational institutions, which serve as the foundation for a country's development. Today's educational institutions are more environmentally sensitive, and more eco-friendly practices are being implemented. Many educational institutions adopt a variety of techniques to address their environmental challenges in order to preserve the environment on campus. It is critical, particularly at educational institutions where young minds congregate, to provide an eco-friendly and sustainable environment with long-lasting characteristics. As a result, conducting a green audit is a critical first step in creating an eco-friendly atmosphere 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 **Kaliabor College**, **Kuwaritol**, **Kaliabor**, **Nagaon**, is to investigate the institution's green practices and create an in-depth audit report to establish where they stand on the environmental coherence spectrum. Kaliabor College's initiative to conduct a Green Audit of its campus is a noteworthy sustainable objective.

One target area was identified and audited for the green audit, viz. **Green Campus (Biodiversity)**, where the overall biodiversity of the institution as well as green practices relevant to green campus were observed and assessed. The strategies followed were conduction of pre-audit meetings, preparation of questionnaires on the specified target areas, on-site physical assessment and questionnaire survey, providing recommendations and development of an action plan, and audit report preparation. Questionnaires were prepared based on the guidelines, rules, acts, and formats set by the Government of India, Ministry of Environment and Forest, New Delhi, and Central Pollution Control Board, New Delhi. The findings of the Green Audit are only indicators on where and why additional efforts are required, and not in any way a criticism or commendation on its present performance.

# 1. INTRODUCTION

A nation's educational institutions serve as its basis for growth, with environmental development playing an important role. Environmental concerns are becoming more visible in today's educational institutions, and new ideas are being applied to make them more ecologically friendly. Numerous educational institutions utilise a variety of methods to address environmental issues on campus, such as energy saving, waste recycling, wastewater reduction, and water harvesting. The operations of educational institutions can have a variety of negative environmental repercussions. Environmental sustainability is becoming a major issue throughout the country. It is vital to create a long-term climate, especially in educational institutions where young minds congregate. To ensure the optimum environment for learning and a balanced ecosystem for everyone associated to the institutions, the green influence on the campus is essential.

Beginning with the academic year 2016-17, all higher education institutions are obliged by the National Assessment and Accreditation Council (NAAC), New Delhi, to submit an annual Environmental or Green Audit Report. The corporate social responsibility of higher education institutions stipulates that they contribute to the reduction of global warming through carbon footprint reduction strategies. Environmental auditing, sometimes known as "green" auditing, compares an organization's environmental performance to its environmental goals and standards. A "green audit" is an official inquiry into an organization's environmental effect. As part of this activity, a green audit is performed to evaluate the present circumstances on campus.

## 1.1. CONCEPT OF GREEN AUDIT

It refers to a wide range of evaluations intended to identify implementation flaws, compliance problems with environmental management systems, and associated remedial actions. The method involves comparing an organization's environmental performance to its environmental goals and policies. Examining environmental activities both on and off the topic areas that impact the environmentally friendly atmosphere is its goal. The "Green Audit" looks at environmental practices both inside and outside of the organisation with the goal of making it more environmentally friendly. Green auditing's primary goal is to examine the work done by an organisation whose operations may endanger the environment's and people's health. Green Audit provides guidance on how to further enhance the state of the

environment while also identifying and addressing the many factors that influence environmental growth.

The process of a green audit involves collecting and analysing data on various environmental aspects of the institution's operations. This data includes energy and water usage, biodiversity, waste generation, and compliance with environmental laws and standards. By analysing the data, a green audit assesses the status of green practices in an institution, which are actions and strategies designed to reduce environmental impact and promote sustainability by minimising waste, reducing pollution, and protecting natural ecosystems. It aims to pinpoint inefficiencies and areas where improvements can be made to reduce the organisation's environmental footprint.

## 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 damage. 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 need to develop a "Green Campus" plan that encourages long-term growth while effectively lowering atmospheric $CO_2$ 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 guarantee that they contribute to the curbing of global warming through Carbon Footprint reduction efforts. As a result, green auditing has become a fundamental need for all educational institutions.

## 1.3. BENEFITS OF GREEN AUDIT FOR EDUCATIONAL INSTITUTIONS

A green audit can assist an educational institution understand how and where it is using and utilising the most energy, water, or other resources. The institution might next consider how to make improvements and generate savings. It may also be used to estimate waste quantity and type, which is important for recycling operations or improving waste minimization programmes. Green auditing has the potential to foster environmental knowledge, morality, ethical values, and health awareness among students and teachers. It helps staff and students realise the benefits of being environmentally conscious on campus. Green auditing encourages cost savings by making use of fewer resources. It offers students and teachers an opportunity to foster a sense of personal ownership and social responsibility. Therefore, it is critical that educational institutions review their own contributions, duties, and commitments to a sustainable future. Some of the benefits of green audit in educational institutions are given 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 promote knowledge and its practical application across society. Higher education institutions also give a wide range of modern environmental solutions. Numerous evolutionary techniques are utilised to investigate environmental challenges. It covers areas 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 grades institutions based on the assessments provided throughout the institution's accreditation process. Green Audit is now a mandatory exercise for educational institutions under NAAC Criterion VII. The goal of green audit is to enhance the internal and external environmental conditions of the institution. Environment-related factors such as waste management, energy saving, air and noise monitoring, and water and wastewater accounting are used to make the institution more ecologically friendly.

# 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 atmosphere promotes and facilitates learning. There are various programs worldwide that address environmental education concerns. A green audit is the most effective and ecologically responsible approach of addressing environmental challenges. This form of professional care is the obligation of every individual involved in an economic, financial, social, or environmental component. Green audits should be undertaken on educational institution campuses since they help students understand the importance of environmental preservation and develop into responsible citizens. It also stipulates what responsibilities educational institutions have to fulfil in order to become a green campus. Therefore, green audit is essential at the institutional level of education.

# 3. ABOUT THE EDUCATIONAL INSTITUTION

## 3.1. A BRIEF HISTORY

The Kaliabor College was established on 26th July, 1969 in Nagaon with the aim of providing higher education at a reasonable cost, to the people of the surrounding economically backward sub-urban areas. Kaliabor College which is affiliated to Gauhati University is a fast growing institution of higher education in middle Assam. It has been catering quality education in Arts, Science and Commerce to the students from Nagaon district as well as parts of Sonitpur, Karbi Anglong and Golaghat districts. The campus is surrounded by heterogeneous vegetation with a fair amount of shady trees naturally found in the locality.

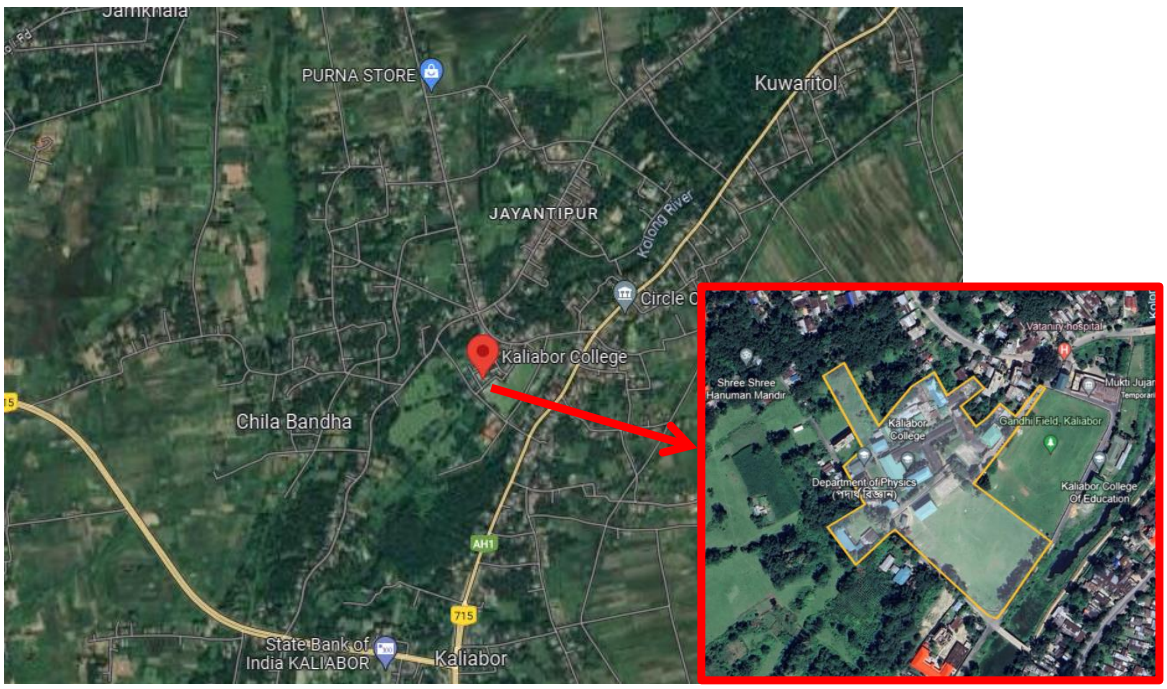


**Photo 1:** Location of Kaliabor College (*Source: Google Earth*).

## 3.2. GEOGRAPHY

The college is located at a small town of Kaliabor under the Kaliabor Sub-Division of Nagaon district. Its locational coordinates are 26°32'57" N and 92°55'45" E. The college is situated in the Middle Brahmaputra Valley zone at an elevation of 93m above sea level. The soil structure is mainly alluvial in nature. Vegetation found around the campus is a mixture of evergreen, semi-evergreen, and deciduous trees, and perennial grasses.

## 3.3. MOTTO, VISION, MISSION AND OBJECTIVES OF THE INSTITUTION

### *3.3.1. MOTTO OF THE INSTITUTION*

- Knowledge with values.

### *3.3.2. VISION AND MISSION OF THE INSTITUTION*

- To make it a Rural Institute of Excellence.
- To create morally and culturally strong human resources with defined skill and competencies that are useful members of the society for the service of the nation.
- To provide opportunity for quality higher education to the deprived and marginalized section of the society in this area.
- To reduce the economic outflow in the form of students opting for institutes outside the area and state.

### *3.3.3. OBJECTIVES OF THE INSTITUTION*

- To provide immediate opportunity for the quality higher education in the area.
- To increase the number of useful graduates in the locality.
- To develop knowledge and skills in the emerging fields by incorporating new and upcoming courses.
- To provide opportunities for physical development sports and extracurricular activities.
- To assume parental role in the area in developing moral and spiritual values among the youths and in making them emotionally sound and enlightened.
- To work against social evils and superstitions in the society.
- To nurture and develop rich cultural heritages following equal opportunity principle emphasising tolerance and humanity.
- To develop the college into an information hub for the rural population not having access to information technology.
- To make up leadership role in creating environmental awareness among the local population.
- To act as a centre of positive social changes and value addition to human resources in the rural area.

## 3.4. GENERAL INFORMATION

### *3.4.1. COLLEGE CAMPUS*

The college campus extends over 38 bighas of land, bordered by Kaliabor 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 Kaliabor College.

### *3.4.2. FACILITIES*

**Classroom**

The college is equipped with 47 well-maintained classrooms for conduction of regular classes and has 10 well-equipped Digital Classrooms for Academic purpose.

**Laboratories**

There are a total of 17 laboratories associated with different departments of Science and Arts, and Computer Education Faculty in the college. The college also has one computer lab and one language lab that was constructed with RUSA funds.

**Central Library**

Kaliabor College has a central library which has a well-furnished reading room and a reference section. The library is computerised having facilities of automated circulation, automated attendance system along with search facility through OPAC (Online Public Access Catalogue) kiosk machine. It is using the standard ILMS with the latest version SOUL 3.0 software of INFLIBNET centre an IUC of UGC. It is well stocked with 43255 books, which includes textbooks, reference books, institutional and local history publications, etc. Besides these, there are newspapers, magazines, journals, maps, etc. The library also has the access facility of E-shodhsindhu (N-LIST) as college component for accessing the e-books and e-journals.


**Photo 3:** Classrooms of Kaliabor College.


**Photo 4:** Laboratories of Kaliabor College


**Photo 5:** Library of Kaliabor College.

**Common rooms for teachers and students**

There are separate rooms for academic departments with attached washrooms and Kitchenettes. All departments are equipped with departmental libraries and wall magazines. There are separate common rooms for boys and girls with adequate facilities for recreation and entertainment.

**Games and Sports Facilities**

The college is well-equipped with indoor and outdoor sports facilities, including a football ground 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:** Indoor and Outdoor Sports Facilities of Kaliabor College.

**Conference Room and Auditorium**

The college has three well-equipped conference rooms named Mahabahu, Kollong, and Smart Classroom Biological Science. The college also has an auditorium named Kaziranga.

**Hostel**

There are 2 two-storeyed hostels, one each for girls and boys in the college campus with all the required facilities such as drinking water, inverter, tables, beds, and chairs.

**Photo 7:** Hostels of Kaliabor College.

**Canteen Facility**

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

**Solar Street Lights and Panels for Electricity Generation**

There are 10 solar powered street lights installed within the college campus along with 30 solar panels installed on the roof of physics department and 20 solar panels on the roof of commerce block with an output of 30 KVA.

### *3.4.3. COURSES AND DEPARTMENTS*

The College offers the following programmes:

**Higher Secondary Programme**

| | | |
|---|---|---|
| Higher Secondary in Science | Higher Secondary in Arts | Higher Secondary in Commerce |

**Under-Graduate Programme in a Stream**

| Programme | Subjects |
|---|---|
| Bachelor of Science (Honours) | Physics, Mathematics, Chemistry, Zoology, Botany, and Statistics |
| Bachelor of Science (Regular) | Offered with a combination of subjects |
| Bachelor of Arts (Honours) | Assamese, Economics, Education, English, History, and Political Science. |
| Bachelor of Arts (Regular) | Offered with a combination of subjects |
| Bachelor of Commerce (Honours) | Accountancy and Management. |
| Bachelor of Commerce (Regular) | Offered with a combination of subjects |

The college has applied to opening up the under graduation course in Geography.

**Under-Graduate Programme in a Discipline (Self-Financed)**

- Bachelor of Business Administration (BBA)
- Bachelor of Computer Application (BCA)
- Bachelor of Science in Biotechnology
- Bachelor of Vocation in Tourism and Service Industry (TSI)
- Bachelor of Vocation in Small Tea Garden Management (STGM)

**Post-Graduate Programme (Self-Financed)**

- Master of Arts in Education (Under Gauhati University)
- Master of Commerce in Accountancy & Finance (Under Gauhati University)
- Master of Commerce in Human Resource & Marketing (Under Gauhati University)

The college has applied to opening up the post-graduation course in Assamese.

**Periodic Courses (Self-Financed)**

- Certificate Course in Computer Application
- Two Month Add-on Course on Handloom and Textiles
- Hand Embroidery Certificate Course for Beginners
- Certificate Course in English Communication
- Certificate Course on C and Python
- Certificate Course on French Language
- Certificate Course on Museum, Artefacts Handling and Documentation
- Add-On Course on Understanding Harappan Civilisation

**Departments**

| | |
|---|---|
| Department of English | Department of Assamese |
| Department of Economics | Department of Education |
| Department of History | Department of Sociology |
| Department of Political Science | Department of Mathematics |
| Department of Statistics | Department of Physics |
| Department of Chemistry | Department of Botany |
| Department of Zoology | Department of Computer Science |
| Department of Biotechnology | Department of Tourism and Service Industry |
| Department of Travel and Tourism Management | Department of Small Tea Garden Management |
| Department of Commerce (B.Com & M.Com) | Department of Business Administration |

## 3.5. PREVIOUS GREEN AUDIT

The previous green audit of Kaliabor College was conducted for the year 2022-2023 by Assam Science Technology and Environment Council (ASTEC). The respective green audit report was the result of an extensive review of all factors associated with the campus's relevant green operations such as land-use, plantations, etc. Additionally, ASTEC made certain recommendations and suggestions to make it a greener campus.

# 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 provided an opportunity to reinforce the scope and objectives of the audit and pre-audit discussions were held to determine the targets of the auditing. This meeting was a necessary precursor for the green audit since it provided the first chance to comprehend the issues. It was held with the concerned persons of the college where target areas were identified and the audit protocol and audit plan were handed over and discussed in advance of the audit itself. 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 specific stakeholders identified in the pre-audit stage were conducted for getting the desired information. Detailed discussions on some specific topic were also held.

**Survey by Questionnaire**

By using a questionnaire survey method, baseline data for the creation of the green audit report were gathered. On the basis of the guidelines, regulations, laws, and formats prepared by the Central Pollution Control Board, the Ministry of Environment, Forests, and Climate Change, New Delhi, and other statutory institutions, questionnaires have been developed to conduct the green audit on the college campus. The questionnaire contained the general

information of the college as well as information pertaining to college biodiversity and maintenance of green campus.

**Review of documents, records and policies**

This was carried out in order to understand the various initiatives taken by the university towards sustainable environmental conservation and amelioration. Documents such as activity reports, plantation lists, biodiversity register, photographs, etc. were examined and data was collected.

**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 vital element of the green audit. The data required for the analysis is taken from the data collection and is tabulated for the convenience of data availability. 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 the best practices followed by the institution
- ✓ Compiling a report of the data collected
- ✓ Distributing the report and certificate to the institution
- ✓ Preparing an action plan to overcome the flaws
- ✓ Providing suggestions to implement the action plan
- ✓ Setting up the future environmental aims and objectives

# 5. GREEN CAMPUS (BIODIVERSITY) AUDIT

## 5.1. OPEN AREA

Along with the built-up area of 22 bigha (57.9% of the total land), the college campus offers roughly 16 bighas (42.1% of the total land) of open space. 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 botanical garden, open playground, and one small artificial pond. The open region, which consists primarily of open ground and botanical 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 artificial pond of Kaliabor College.

## 5.2. CAMPUS FLORA

The college has meticulously cultivated its own botanical garden and 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 79 species under 73 genera from 47 families has been enumerated. Species occurrence was highest from the Orchidaceae family with 10 species, followed by Apocynaceae with 6 species, Fabaceae with 5 species, , Lamiaceae with 4 species, and Combretaceae, Myrtaceae and Rutaceae with 3 species each. The college has also established a Medicinal Plant cum Herbal Garden, and an Orchidarium to inculcate scientific aptitudes among the students towards conservation importance of medicinal plants and orchid species. 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 and vernacular name, and IUCN status.

| Sl. No. | Plant species | Family | Common name | IUCN |
|---|---|---|---|---|
| 1 | *Acampe praemorsa* (Roxb.) Blatt. & McCann | Orchidaceae | Brittle Orchid | Not Evaluated |
| 2 | *Aegle marmelos* (L.) Corrêa | Rutaceae | Stone Apple (বেল) | Near Threatened |
| 3 | *Aerides odorata* Lour. | Orchidaceae | Fragrant Fox Brush Orchid (গনেশ কপৌ) | Not Evaluated |
| 4 | *Albizia lebbeck* (L.) Benth. | Fabaceae | Indian Siris (শিৰীষ) | Least Concern |
| 5 | *Aloe vera* (L.) Burm | Asphodelaceae | Aloe Vera (চাল-কুঁৱৰী) | Not Evaluated |
| 6 | *Alstonia scholaris* (L.) R.Br. | Apocynaceae | Blackboard Tree (ছতিয়না) | Least Concern |
| 7 | *Areca catechu* L. | Arecaceae | Areca Palm (তামোল) | Data Deficient |
| 8 | *Asparagus racemosus* Willd. | Asparagaceae | Indian Asparagus (শতমূল) | Not Evaluated |
| 9 | *Azadirachta indica* A.Juss. | Meliaceae | Neem (নিম) | Least Concern |
| 10 | *Bauhinia variegata* L. | Fabaceae | Mountain Ebony (কাঞ্চন) | Least Concern |
| 11 | *Bombax ceiba* L. | Malvaceae | Red Silk Cotton Tree (শিমুল) | Least Concern |
| 12 | *Bougainvillea glabra* Choisy | Nyctaginaceae | Paper Flower (কাগজ ফুল) | Least Concern |
| 13 | *Caesalpinia pulcherrima* (L.) Sw. | Fabaceae | Peacock Flower (ৰাধাচূড়া) | Least Concern |
| 14 | *Camellia sinensis var. assamica* (Royle ex Hook.) Steenis | Theaceae | Assam Tea (অসমীয়া চাহপাত) | Not Evaluated |
| 15 | *Canna indica* L. | Cannaceae | Indian Shot (পাৰিজাত) | Not Evaluated |
| 16 | *Cascabela thevetia* (L.) Lippold | Apocynaceae | Yellow Oleander (কৰবী) | Least Concern |
| 17 | *Cassia fistula* L. | Fabaceae | Golden Shower Tree (সোণাৰু) | Least Concern |
| 18 | *Centella asiatica* (L.) Urb. | Apiaceae | Asiatic pennywort (বৰ মানিমুনি) | Least Concern |
| 19 | *Citrus aurantifolia* (Christm.) Swingle | Rutaceae | Lime (গোল নেমু) | Not Evaluated |
| 20 | *Cocos nucifera* L. | Arecaceae | Coconut (নাৰিকল) | Not Evaluated |
| 21 | *Coelogyne imbricata* (Hook.) Rchb.f. | Orchidaceae | Necklace Orchid | Not Evaluated |
| 22 | *Cycas revoluta* Thunb. | Cycadaceae | Sago Palm | Least Concern |
| 23 | *Cymbidium aloifolium* (L.) Sw. | Orchidaceae | Aloe-leafed Cymbidium (মতা কপৌ) | Not Evaluated |
| 24 | *Datura metel* L. | Solanaceae | Devil's Trumpet (ধতুৰা) | Not Evaluated |
| 25 | *Delonix regia* (Bojer ex Hook.) Raf. | Fabaceae | Flame tree (কৃষ্ণচূড়া) | Least Concern |
| 26 | *Dendrobium aphyllum* (Roxb.) C.E.C.Fisch. | Orchidaceae | Hooded Orchid (শালিকী ঠোঁটিয়া কপৌ) | Least Concern |
| 27 | *Dendrobium mannii* Ridl. | Orchidaceae | Mann's Dendrobium | Not Evaluated |
| 28 | *Dendrobium moschatum* (Buch.-Ham.) Sw. | Orchidaceae | Musky-smelling Dendrobium | Not Evaluated |
| 29 | *Dendrolirium lasiopetalum* (Willd.) S.C.Chen & J.J.Wood | Orchidaceae | Woolly Eria | Not Evaluated |
| 30 | *Duranta erecta* L. | Verbenaceae | Golden Dewdrop (কনকাম্ভ) | Least Concern |
| 31 | *Eucalyptus camaldulensis* Dehnh. | Myrtaceae | River Red Gum | Neat Threatened |
| 32 | *Ficus rumphii* Blume | Moraceae | Golden Rumph's Fig (পাকৰি) | Not Evaluated |
| 33 | *Garuga pinnata* Roxb. | Burseraceae | Grey Downy Balsam (ৰহিমলা) | Not Evaluated |

| Sl. No. | Plant species | Family | Common name | IUCN |
|---|---|---|---|---|
| 34 | *Gmelina arborea* Roxb. ex Sm. | Lamiaceae | White Teak (গমাৰী) | Least Concern |
| 35 | *Hibiscus rosa-sinensis* L. | Malvaceae | Chinese Hibiscus (জবা) | Not Evaluated |
| 36 | *Houttuynia cordata* Thunb. | Saururaceae | Fresh Mint (মছন্দৰী) | Not Evaluated |
| 37 | *Kalanchoe pinnata* (Lam.) Pers. | Crassulaceae | Air Plant (দুপৰ টেঙা) | Not Evaluated |
| 38 | *Lagerstroemia speciosa* (L.) Pers. | Lythraceae | Queen's Crape Myrtle (আজাৰ) | Not Evaluated |
| 39 | *Leucas aspera* L. | Lamiaceae | Common leucas (দোৱোণ বন) | Not Evaluated |
| 40 | *Mangifera indica* L. | Anacardiaceae | Common Indian Mango (আম) | Data Deficient |
| 41 | *Melaleuca citrina* (Curtis) Dum.Cours. | Myrtaceae | Crimson Bottle Brush | Not Evaluated |
| 42 | *Melia azedarach* L. | Meliaceae | Chinaberry (ঘোঁৰা নিম) | Least Concern |
| 43 | *Mesua ferrea* L. | Calophyllaceae | Nahor (নাহৰ) | Not Evaluated |
| 44 | *Mimusops elengi* L. | Sapotaceae | Indian Medlar (বকুল) | Least Concern |
| 45 | *Monoon longifolium* (Sonn.) B.Xue & R.M.K.Saunders | Annonaceae | False Ashoka (দেৱদাৰু) | Not Evaluated |
| 46 | *Moringa oleifera* Lam. | Moringaceae | Drumstick Tree (চজিনা) | Least Concern |
| 47 | *Morus alba* L. | Moraceae | White Mulberry (নুনি) | Not Evaluated |
| 48 | *Murraya paniculata* (L.) Jack | Rutaceae | Orange Jasmine (কামিনী কাঞ্চন) | Not Evaluated |
| 49 | *Musa paradisiaca* L. | Musaceae | Plantain (কাচকল) | Not Evaluated |
| 50 | *Nerium oleander* L. | Apocynaceae | Rose Bay (কৰবি) | Least Concern |
| 51 | *Ocimum tenuiflorum* L. | Lamiaceae | Holy Basil (তুলসী) | Not Evaluated |
| 52 | *Oxalis corniculata* L. | Oxalidaceae | Creeping Woodsorrel (টেঙেচী টেঙা) | Not Evaluated |
| 53 | *Oxalis debilis* Kunth | Oxalidaceae | Pink Woodsorrel (বৰ টেঙেচী) | Not Evaluated |
| 54 | *Pandanus* sp. | Pandanaceae | Screw pine | Unidentified Species |
| 55 | *Phyllanthus emblica* L. | Phyllanthaceae | Indian Gooseberry (আমলখি) | Least Concern |
| 56 | *Piper longum* L. | Piperaceae | Indian Long Pepper ( পিপলি) | Not Evaluated |
| 57 | *Pistia stratiotes* L. | Araceae | Water Lettuce (বৰপুণি) | Least Concern |
| 58 | *Platycladus orientalis* (L.) Franco | Cupressaceae | Oriental Arborvitae (থুজা) | Near Threatened |
| 59 | *Pouzolzia zeylanica* (L.) Benn. | Urticaceae | Pouzolz's Bush (বৰালি বকুৰা) | Not Evaluated |
| 60 | *Punica granatum* L. | Lythraceae | Pomegranate (ডালিম) | Least Concern |
| 61 | *Rauvolfia serpentina* (L.) Benth. ex Kurz | Apocynaceae | Indian Snakeroot (সর্পগন্ধা) | Least Concern |
| 62 | *Rauvolfia tetraphylla* L. | Apocynaceae | Devil Pepper (বন্য সর্পগন্ধা) | Least Concern |
| 63 | *Rhynchostylis retusa* (L.) Blume | Orchidaceae | Foxtail Orchid (কপৌ) | Not Evaluated |
| 64 | *Ricinus communis* L. | Euphorbiaceae | Castor Oil Plant (এৰাগছ) | Not Evaluated |
| 65 | *Rosa indica* L. | Rosaceae | Rose (গোলাপ) | Not Evaluated |
| 66 | *Santalum album* L. | Santalaceae | Indian Sandalwood (বগা চন্দন) | Vulnerable |
| 67 | *Shorea robusta* C.F.Gaertn. | Dipterocarpaceae | Sal (শাল) | Least Concern |
| 68 | *Sphagneticola calendulacea* (L.) Pruski | Asteraceae | Chinese Wedelia (ভৃংগৰাজ) | Not Evaluated |
| 69 | *Syzygium cumini* (L.) Skeels | Myrtaceae | Jamun (ক'লা জামু) | Least Concern |
| 70 | *Tectona grandis* L.f. | Lamiaceae | Teak (চেগুন) | Endangered |

| Sl. No. | Plant species | Family | Common name | IUCN |
|---|---|---|---|---|
| 71 | *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn. | Combretaceae | Arjun (অর্জুন) | Not Evaluated |
| 72 | *Terminalia bellirica* (Gaertn.) Roxb. | Combretaceae | Beleric Myrobalan (ভোমোৰা) | Least Concern |
| 73 | *Terminalia chebula* Retz. | Combretaceae | Chebulic Myrobalan (শিলিখা) | Least Concern |
| 74 | *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson | Menispermaceae | Heart-leaved Moonseed (শগুনী লতা) | Not Evaluated |
| 75 | *Vanilla planifolia* Andrews | Orchidaceae | Flat-leaved Vanilla (ভেনিলা) | Endangered |
| 76 | *Vernonia* sp. | Asteraceae | Ironweed | Unidentified Species |
| 77 | *Vinca minor* L. | Apocynaceae | Common Periwinkle (নয়নতৰা) | Least Concern |
| 78 | *Withania somnifera* (L.) Dunal | Solanaceae | Indian Ginseng (অশ্বগন্ধা) | Data Deficient |
| 79 | *Ziziphus mauritiana* Lam. | Rhamnaceae | Indian Jujube (বগৰী) | Least Concern |

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

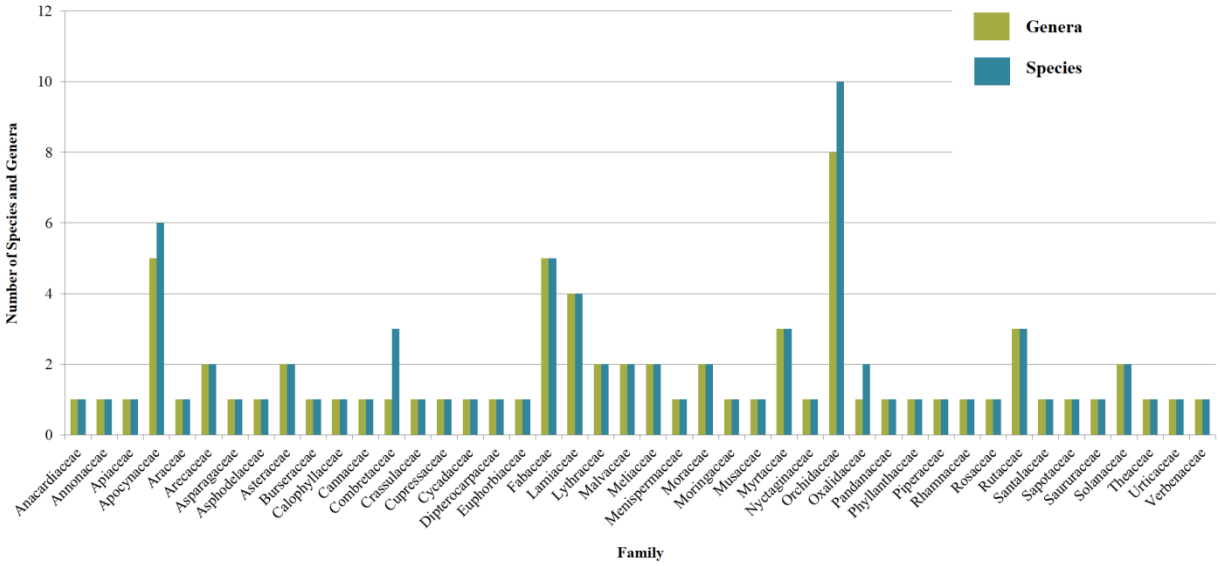


**Figure 1:** No. of floral species, genera and family enumerated in the college campus during audit.

Evaluation of IUCN status of the plants listed above showed that most of the species are "Not Evaluated" (38 species), followed by 30 species falling under the "Least Concern" category. However, the college houses species that is "Vulnerable" (1 species), "Endangered" (2 species), as well as "Near Threatened" (3 species). 3 species were found to be falling under the "Data Deficient" category. 2 species remained "Unidentified". A pie-chart showing the above mentioned data is given as follows.

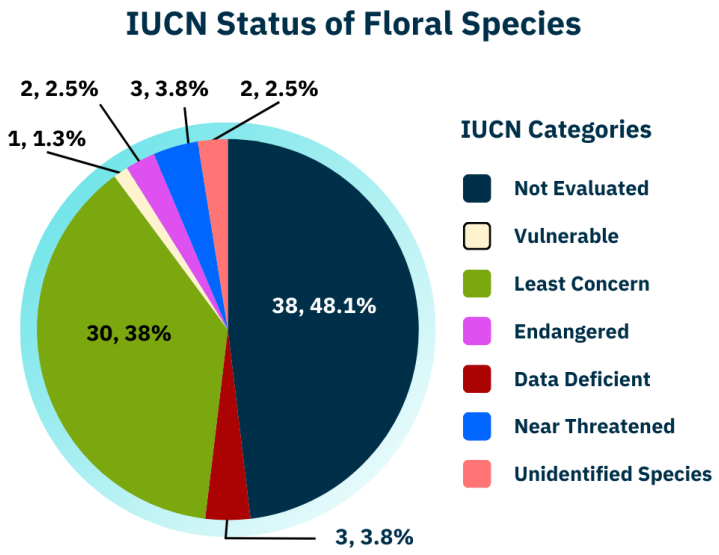


**Figure 2:** IUCN status of the floral species enumerated in the college campus during audit.

**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 javanicus* | Aves | Passeriformes | Sturnidae | Javan Myna |
| 2 | *Acridotheres tristis* | Aves | Passeriformes | Sturnidae | Common Myna |
| 3 | *Anastomus oscitans* | Aves | Ciconiiformes | Ciconiidae | Asian Openbill |
| 4 | *Apus apus* | Aves | Apodiformes | Apodidae | Common Swift |
| 5 | *Ardea intermedia* | Aves | Pelecaniformes | Ardeidae | Intermediate Egret |
| 6 | *Ardeola grayii* | Aves | Pelecaniformes | Ardeidae | Indian Pond Heron |
| 7 | *Bubulcus ibis* | Aves | Pelecaniformes | Ardeidae | Cattle egret |
| 8 | *Callosciurus pygerythrus* | Mammalia | Rodentia | Sciuridae | Hoary bellied Squirrel |
| 9 | *Calotes versicolor* | Mammalia | Squamata | Agamidae | Garden Lizard |
| 10 | *Canis lupus famliliaris* | Mammalia | Carnivora | Canidae | Dog |
| 11 | *Catopsilia pomona* | Insecta | Lepidoptera | Pieridae | Common Emigrant Butterfly |
| 12 | *Chalcophaps indica* | Aves | Columbiformes | Columbidae | Common Emerald Dove |
| 13 | *Copsychus saularis* | Aves | Passeriformes | Muscicapidae | Oriental Magpie Robin |
| 14 | *Corvus splendens* | Aves | Passeriformes | Corvidae | House Crow |
| 15 | *Cuculus micropterus* | Aves | Cuculiformes | Cuculidae | Indian Cuckoo |
| 16 | *Danaus genutia* | Insecta | Lepidoptera | Nymphalidae | Striped Tiger Butterfly |
| 17 | *Dendrocopos darjellensis* | Aves | Piciformes | Picidae | Darjeeling Woodpecker |
| 18 | *Dicrurus macrocercus* | Aves | Passeriformes | Dicruridae | Black Drongo |
| 19 | *Eudynamys scolopaceus* | Aves | Cuculiformes | Cuculidae | Asian Koel |
| 20 | *Eurema hecabe* | Insecta | Lepidoptera | Pieridae | Grass Yellow Butterfly |
| 21 | *Gracula religiosa* | Aves | Passeriformes | Sturnidae | Common Hill Myna |
| 22 | *Gracupica contra* | Aves | Passeriformes | Sturnidae | Indian Pied Starling |
| 23 | *Halcyon smyrnensis* | Aves | Coraciiformes | Alcedinidae | White Breasted Kingfisher |
| 24 | *Hemidactylus frenatus* | Reptilia | Squamata | Gekkonidae | Common House Gecko |
| 25 | *Herpestes edwardsi* | Mammalia | Carnivora | Herpestidae | Indian Gray Mongoose |
| 26 | *Junonia almana* | Insecta | Lepidoptera | Nymphalidae | Peacock Pansy Butterfly |
| 27 | *Junonia atlites* | Insecta | Lepidoptera | Nymphalidae | Grey pansy Butterfly |
| 28 | *Junonia lemonias* | Insecta | Lepidoptera | Nymphalidae | Lemon Pansy Butterfly |
| 29 | *Lepus nigricollis* | Mammalia | Lagomorpha | Leporidae | Indian Hare |
| 30 | *Lonchura punctulata* | Aves | Passeriformes | Estrildidae | Spotted Munia |
| 31 | *Macaca mulatta* | Mammalia | Primates | Cercopithecidae | Rhesus Macaque |

## 5.4. BEST PRACTICES PERTAINING TO GREEN CAMPUS

As part of its ongoing commitment to maintaining a green campus, the college has participated in a number of environmental initiatives. Planting and nurturing trees, maintaining a botanical and medicinal garden on campus, establishing an Orchidarium, organising campus-wide clean-up activities, and commemorating ecologically and environmentally significant days are just a few examples. Such noteworthy activities include:

### *5.4.1. PLANTATIONS*

The Kaliabor college administration promotes environmental protection and organises tree planting programmes on the Kaliabor college campus on World Environment Day and other occasions every year. The programmes engage both students and members of the teaching and non-teaching faculties. Individual students and teachers with whom the audit team interacted were aware of and interested in caring for the campus floras. The flora on campus serve an assortment of functions, including enhancing the quality of the surrounding natural environment, bringing in more wildlife, including birds, and expanding its habitat, as well as enhancing the area's water quality.


**Photo 10:** Plantation programmes organised by Kaliabor College during 2023-2024.

### *5.4.2. DEVELOPMENT OF BOTANICAL GARDEN*

The college has also established a Botanical Garden in a 2 bigha land within the college campus to conserve and propagate locally available floral species. Different species of tree species has been planted in the garden which has been listed in Table 1.


**Photo 11:** Botanical garden in the college campus.

### *5.4.3. DEVELOPMENT OF MEDICINAL GARDEN*

The college has also established a Medicinal Plant Garden to instil scientific aptitudes in students regarding the necessity of medicinal plant conservation. Plantation and conservation of locally available medicinal plants are undertaken by the college authorities through the medicinal plant garden. Following are some of the key medical plant species found in the garden:

**Table 3:** Medicinal plants of the college and their uses.

| Sl. No | Species | Family | Common/ Vernacular Name | Medicinal value/use |
|---|---|---|---|---|
| 1 | *Aloe vera* (L.) Burm | Asphodelaceae | Aloe Vera (চাল-কুঁৱৰী) | Anti-inflammatory, anti-microbial. It is used to treat skin injuries, burns, cuts, insect bites, eczemas, and digestive problems. |
| 2 | *Asparagus racemosus* Willd. | Asparagaceae | Indian Asparagus (শতমূল) | It is used against upset stomach (dyspepsia), constipation, stomach spasms, and stomach ulcers. |
| 3 | *Azadirachta indica* A.Juss. | Meliaceae | Neem (নিম) | Anti-fungal, anti-oxidant, anti- inflammatory and anti-bacterial. It is used to treat leprosy, eye disorders, bloody nose, intestinal worms, stomach upset, loss of appetite, skin ulcers, etc. |
| 4 | *Camellia sinensis var. assamica* (Royle ex Hook.) Steenis | Theaceae | Assam Tea (অসমীয়া চাহপাত) | Anti-inflammatory and antioxidant. The leaves can be used internally to treat diarrhea, dysentery, hepatitis, and gastroenteritis. The leaves can be used externally as a wash or poultice to treat cuts, burns, bruises, insect bites, ophthalmia, and swellings. |
| 5 | Centella asiatica (L.) Urb. | Apiaceae | Asiatic pennywort (বৰ মানিমুনি) | Anti-oxidant, anti-cellulite and anti-inflammatory. It is used to treat skin diseases, infective wounds, burns, hypertrophic scar, anaemia, nosebleeds, mental illness and dehydration. |
| 6 | *Citrus aurantifolia* (Christm.) Swingle | Rutaceae | Lime (গোল নেমু) | Antibacterial, antidiabetic, antifungal, anti-hypertensive, anti-inflammation, anti-lipidemia and antioxidant. It can be used to preserve the flavour and freshness of food. |
| 7 | *Houttuynia cordata* Thunb. | Saururaceae | Fresh Mint (মছন্দৰী) | Anti-inflammatory, anti-bacterial, anti- viral, and anti-oxidant. It is used to treat cold, cough, fever, pneumonia, mumps, and tumors. |
| 8 | *Kalanchoe pinnata* (Lam.) Pers. | Crassulaceae | Air Plant (দুপৰ টেঙা) | Anti-bacterial, anti-inflammatory, anti- viral, and antifungal. It is used to treat stomach disorder, jaundice, fever, diarrhoea, etc. |
| 9 | *Morus alba* L. | Moraceae | White Mulberry (নুনি) | It is used against dizziness, insomnia, premature aging, liver and kidney disorders, and inflammation |
| 10 | *Ocimum tenuiflorum* L. | Lamiaceae | Holy Basil (তুলসী) | Anti-microbial, anti-diarrheal, anti-oxidant, anti-cataract, and anti-inflammatory. It is used to treat cough, asthma, diarrhoea, fever, dysentery, arthritis, eye diseases, indigestion, gastric ailments, etc. |
| 11 | *Oxalis corniculata* L. | Oxalidaceae | Creeping Woodsorrel (টেঙেচী টেঙা) | Antimicrobial, antioxidant, wound healing, antifungal, antidiabetic, anticancer, antidiarrheal, antiulcer, anti-inflammatory, antiamoebic, hepatoprotective, nematocidal and cardio-protective. |
| 12 | *Oxalis debilis* Kunth | Oxalidaceae | Pink Woodsorrel (বৰ টেঙেচী) | Antidiarrheal, anti-inflammatory, antipyretic, analgesic, antimicrobial, antiamoebic, antioxidant and anthelmintic. Leaf decoction of *Oxalis debilis* can be used to manage diabetes. It can also be used to treat skin infections and helminthiasis. |

| Sl. No | Species | Family | Common/ Vernacular Name | Medicinal value/use |
|---|---|---|---|---|
| 13 | *Phyllanthus emblica* L. | Phyllanthaceae | Indian Gooseberry (আমলখি) | Anti-diabetic, hypolipedemic, anti-microbial, anti-inflammatory, and anti-oxidant. It is used to treat diabetes, fever, anaemia, jaundice, bleeding disorders, hiccough, arthritis, diarrhoea, inflammation, etc. |
| 14 | *Piper longum* L. | Piperaceae | Indian Long Pepper (পিপলি) | It is used to treat chronic bronchitis, asthma, constipation, gonorrhoea, paralysis of the tongue, diarrhea, cholera, chronic malaria, viral hepatitis, respiratory infections, stomach ache, bronchitis, diseases of the spleen, cough, and tumors. |
| 15 | *Rauvolfia serpentina* (L.) Benth. ex Kurz | Apocynaceae | Indian Snakeroot (সর্পগন্ধা) | Antihypertensive, Antibacterial, antifungal, and anti-inflammatory, It is used to treat high blood pressure. It is used to treat psychotic disorders like anxiety, insomnia, and schizophrenia. The roots of *Rauvolfia serpentina* are used to treat rheumatism. |
| 16 | *Sphagneticola calendulacea* (L.) Pruski | Asteraceae | Chinese Wedelia (ভৃংগৰাজ) | Its leaves are used in dyeing grey hair and in promoting the growth of hair. They are considered tonic, alternative, and useful in coughs, cephalalgia, skin diseases, and alopecia. The juice of the leaves is much used as a snuff in cephalalgia. |
| 17 | *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson | Menispermaceae | Heart-leaved Moonseed (শগুণী লতা) | Anti-periodic, anti-spasmodic, anti-microbial, anti-osteoporotic, anti-inflammatory, anti-arthritic, anti-allergic, and anti-diabetic properties. It is used to treat diabetes, high cholesterol, allergic rhinitis (hay fever), upset stomach, gout, lymphoma and other cancers. |
| 18 | *Vinca minor* L | Apocynaceae | Common Periwinkle (নয়নতৰা) | It is used to treat diarrhea, vaginal discharge, throat ailments, tonsillitis, chest pain, high blood pressure, sore throat, intestinal pain, etc. |
| 19 | *Withania somnifera* (L.) Dunal | Solanaceae | Indian Ginseng (অশ্বগন্ধা) | Anti-inflammatory, anti-tumor, anti-stress and antioxidant. It can help reduce stress and anxiety symptoms. It may help with neurological disorders like Alzheimer's disease, Parkinson's disease, and Huntington's disease. |

### *5.4.4. DEVELOPMENT OF ORCHIDARIUM*

The College has also developed an orchidarium where locally available orchid species are conserved and propagated. A list of the orchid species housed in the orchidarium is given as follows:

**Table 4:** Orchids housed in the orchidarium of the college.

| Sl. No. | Plant species | Family | Common / Vernacular Name | IUCN Status |
|---|---|---|---|---|
| 1 | *Acampe praemorsa* (Roxb.) Blatt. & McCann | Orchidaceae | Brittle Orchid | Not Evaluated |
| 2 | *Aerides odorata* Lour. | Orchidaceae | Fragrant Fox Brush Orchid (গনেশ কপৌ) | Not Evaluated |
| 3 | *Coelogyne imbricata* (Hook.) Rchb.f. | Orchidaceae | Necklace Orchid | Not Evaluated |
| 4 | *Cymbidium aloifolium* (L.) Sw. | Orchidaceae | Aloe-leafed Cymbidium (মতা কপৌ) | Not Evaluated |
| 5 | *Dendrobium aphyllum* (Roxb.) C.E.C.Fisch. | Orchidaceae | Hooded Orchid (শালিকী ঠোঁটিয়া কপৌ) | Least Concern |
| 6 | *Dendrobium mannii* Ridl. | Orchidaceae | Mann's Dendrobium | Not Evaluated |
| 7 | *Dendrobium moschatum* (Buch.-Ham.) Sw. | Orchidaceae | Musky-smelling Dendrobium | Not Evaluated |
| 8 | *Dendrolirium lasiopetalum* (Willd.) S.C.Chen & J.J.Wood | Orchidaceae | Woolly Eria | Not Evaluated |
| 9 | *Rhynchostylis retusa* (L.) Blume | Orchidaceae | Foxtail Orchid (কপৌ) | Not Evaluated |
| 10 | *Vanilla planifolia* Andrews | Orchidaceae | Flat-leaved Vanilla (ভেনিলা) | Endangered |


**Photo 12:** Orchidarium of Kaliabor College.

### *5.4.5. CAMPUS CLEANLINESS: VERMICOMPOSTING AND ECO-BRICK*

Kaliabor College has its own facility that collects the solid wastes daily from residential complex, hostels and departments. The college campus is regularly cleaned and all the waste collected is separated into three categories: i) Organic waste, ii) Plastic waste and iii) other waste. The college has established a vermicomposting unit where all the collected organic wastes are accumulated and turned into vermicompost which is used as manure for the plants within the campus. The institution also features an Eco-brick manufacturing machine (prototype) that converts collected plastic waste into environment friendly eco bricks. Aside from this, solid waste management at the college is in order, with the installation of an incinerator and dustbins strategically positioned across campus.


**Photo 13:** Vermicomposting unit, Eco-brick making equipment and dustbins placed in the campus.

### *5.4.6. 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:

- Popular & Motivational Talk on Biodiversity Conservation held on 29th August 2023. Dr. Vijay Anand Ismavel was the invited speaker.
- Chemistry students participated in a plantation drive, contributing to the college's green initiative on 8th September 2023.
- NSS Unit organised a plastic collection drive on 11th September 2023.
- 3 Days Hands-on Training Program on Orchid Germplasm Maintenance and Commercialization held between 20th and 22nd September 2023.
- Guest Lecture Programme was organised on the occasion of World Tourism Day (27th September 2023) on the theme "Tourism and Green Investments." Abidur Rahman, a naturalist from Kaziranga National Park graced the programme.
- Faculty of Commerce hosted an ICSSR-sponsored seminar focusing on the Green Economy and its challenges on 10th and 11th November 2023.
- The Department of Botany organized a botanical excursion to Dihing Patkai National Park and Maguri Beel on 23rd February 2024.
- NCC and NSS units of Kaliabor College organized a cleanliness drive at Kaziranga National Park on 03rd May 2024.
- Guest lecture programme held on the occasion of World Environment Day (5th June, 2024). A keynote address by Mr. Horendra Nath Morang, expert on land restoration, as well as a poster-making competition and a plantation drive were organised.
- **Eco Club Workshops: Solid Waste Management & Vermicomposting**

  The Eco Club of Kaliabor College organized two impactful workshops aimed at promoting environmental sustainability.

  (a) ***Solid Waste Management Workshop (12th May 2024):*** The session focused on waste reduction and recycling through hands-on activities, including a plantation programme and construction of benches from discarded plastic bottles.

  (b) ***Vermicomposting Workshop (26th May 2024):*** The workshop, under the "Mission LiFE in Assam" banner, introduced students to the bioconversion process of organic waste into nutrient-rich fertilizer, teaching them sustainable waste management practices.


**Figure 14:** Various awareness programmes conducted by Kaliabor College on Green Campus (biodiversity) and relevant issues.

# 6. RECOMMENDATIONS

Based on the visit and discussions with college authority officials, the audit team came to the conclusion that the institution needed a future road map in order to strengthen its efforts in adopting a green and clean approach and exhibit its concern for the environment and nature. Additionally, it is recommended that the college administration keep up this routine for carrying out environmental and green audits, as the audit team felt that doing so would raise awareness and foster participation among faculty, staff, and students, and that the positive trend would endure over time. The audit team has also recommended the following:

1) In order to increase the faunal diversity of the college, plantation of more indigenous fruit yielding plants such as *Baccaurea ramiflora* (লেটেকু), *Flacourtia jangomas* (পনিয়ল), *Averrhoa carambola* (কৰ্দৈ), etc. may be given priority. The college can also opt to develop a butterfly garden with local flowering plant species to create, improve, and maintain habitat for lepidopterans including butterflies, skippers, and moths.

2) It is recommended that the college may intensify their plantation drives and plant floral species which are locally available and gives economic benefits to the people. Plantations can be done in the Biodiversity Park where much of empty spaces are available. Whenever such plantation drives are conducted the college must ensure to maintain a list of the plant species and their numbers being planted as well as of the people who have planted them.

3) It is also recommended that periodic cleaning of weeds and grasses in the botanical garden be done so that the planted trees can grow easily. The number of orchid species in the orchidarium may be increased and exotic species be collected and introduced in order to increase their numbers and facilitate their conservation

4) The institution has an excellent potential to capture rainwater from the rooftops of campus buildings, which the college management may utilise for an assortment of activities. Given that rainwater harvesting has been used on a modest scale at the institution, the college may elect to establish additional rainwater collection infrastructures on building roofs in phases. This will enable the future Green Audit team to compare the progress made by the college administration.

5) The college can opt to employ the Miyawaki Method of gardening and cultivation for their gardens and the Biodiversity Park. The Miyawaki method is a tree planting technique that uses native plants to quickly create forests on degraded land. It involves analysing and improving the soil, electing 50 to 100 local plant species, planting the seedlings in clumps and very densely, monitoring, watering, and weeding the site for two to three years and creating a natural environment with four layers of vegetation: canopy trees, trees, sub-trees, and shrubs.

6) As informed by the college authority of bird deaths because of losing flight control due to intense reflection from glasses of the buildings, especially the canteen, it is recommended to install and raise agro-shed net at the side of reflective glasses to reduce the reflection intensity.

7) The college can also adopt a “No Motor Vehicle Day” for one day per week or one day per two weeks or one day per month for commuting to the college. This can have a reasonable impact on the carbon footprint of the college.

8) It is recommended that an Environmental Management System (EMS) be constituted in the college that will be responsible for overseeing all the environment related issues of the college and the activities pertaining to it. The EMS will act as an internal audit team, assisting external audit officers with future audits. Along with the college's teaching and non-teaching personnel, students shall be included as volunteer members of the EMS.

9) An environmental policy paper must be prepared and developed that includes all of the recommendations, the college's current practises, and a roadmap and action plan for adopting the recommendations within a certain time frame. This policy shall be revised following each green audit, and the college will adhere to it to make the campus more sustainable for the environment. To be a comprehensive policy, the policy must also incorporate the overarching environmental vision, mission, goals, and objectives.

# 7. CONCLUSION

The green audit is an important instrument for ensuring that natural resources are managed fairly and balanced. Green audits are essential for analysing and assessing whether institutional practices are sustainable and environmentally conscious. It is a rigorous approach to finding, measuring, recording, reporting, and monitoring biological and environmental components in an area in question. 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 ideal path for long-term growth.

The audit team believes that professors, support staff, and students all have a strong awareness of environmental responsibility. The audit team feels that the environment is well-maintained across the college campus, and authorities have been observed to be particularly concerned about the college's overall appearance and cleanliness. The unstructured sections of the college campus have helped to replenish the groundwater. To allow for ground water recharge, future development projects must be properly balanced with proportionate open space. Some of the audit team's findings might help the college campus become greener and more environmentally friendly. The conclusions are accompanied with recommendations for the college administration to adopt.

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