KARIMGANJ COLLEGE

Karimganj, Assam-788710

GREEN AUDIT REPORT

2020-21, 2021-22 & 2022-23

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CERTIFICATE OF GREEN AUDIT

This is to certify that Karimganj College, Karimganj, Assam has successfully undergone Green Audit for the session 2020-21, 2021-22 & 2022-23 on 19 January, 2024. The green initiatives carried out by the college have been verified based on the report submitted. The efforts taken by the college management and faculty towards maintenance of green campus and sustainability was found satisfactory.

19/01/2024

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ACKNOWLEDGEMENT

Karimganj College is committed to safeguard the natural environment in and outside its campus and this Green Audit Report will aid in the process of attaining an eco-friendly sustainable environment. Internal Green Audit Committee, Karimganj College has carried out the whole process of Green Audit and the present report is the outcome of the sincere effort of all the persons who were directly or indirectly involved in the entire exercise of Green Audit. I, on behalf of Internal Green Audit Committee express sincere gratitude to Dr. Ramanuj Chakravorty, Principal, Karimganj College for assigning the task of Green Audit of the college to the Committee and also for providing full support and guidance as and when required.

I am indebted to Prof. Pranab Behari Mazumder, Department of Biotechnology, Assam University, Silchar; Prof. Ajit Kumar Das, Department of Ecology and Environmental Science, Assam University, Silchar; Shri Ashok Das, Executive Engineer, PHE, Karimganj and Shri Haydar H Laskar , Range Forest Officer, Sadar Range, Karimganj Division (T) for conducting Green Audit of the College Campus. I am also thankful to them for appreciating the initiatives taken by the College in connection with maintenance of eco-friendly campus and providing us some valuable suggestions as well.

I would like to express my gratitude to Prof. Anupam Das Talukder, Department of Life Sciences, Assam University, Silchar; Dr. Tapati Das, Associate Professor, Department of Ecology & Environmental Science, Assam University, Silchar; Shri Shyamal Prasad Choudhury, Environmental activist, Incharge CD Plant, Environment Cell (Retd.) HPC, Panchgram, Hailakandi, Assam and Dr. Mrinmoy Deb, Consultant Physician for giving us necessary inputs to this exercise of Green Audit.

I am thankful to the PHE, Karimganj division for analysis of water sample collected from different sources of college campus. I am also thankful to Central Control Room for Air Quality Management– All India, CPCB, Govt. of India for real time air quality data.

I am indebted to all the faculty members of the college for their valuable suggestions extended at different stages of Green Audit. I am obliged to all other staff members who were actively involved while collecting the data and conducting field measurements.

Internal Green Audit Committee, Karimganj College also appreciates the cooperation extended by all our dear students to the Committee during the entire process.

We do hope that this Green Audit report certainly help in the maintenance of eco-friendly environment and sustainable development of the college. We are committed to implement the recommendations received from the experts which will help us taking it to higher levels.

Pradip Kumar Nath

Date: 19 January, 2024

(Dr. Pradip Kumar Nath)
Chairperson, Internal Green Audit Committee
Karimganj College, Karimganj

Internal Green Audit Committee

Members:

1. Dr. Pradip Kumar Nath, Associate Professor, Department of Botany & Biotechnology, **Chairperson**
2. Dr. Sanjib Kar, Associate Professor, Department of Chemistry
3. Dr. Partha Sarathi Das, Associate Professor, Department of Botany & Biotechnology
4. Dr. Anup Dey, Assistant Professor, Department of Zoology
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8. Dr. Sujit Tewari, Co-ordinator, IQAC
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External member

Prof. Anupam Das Talukder, Department of Life Science & Bioinformatics, Assam University, Silchar.

Special invitee

Dr. Tapati Das, Associate Professor, Department of Ecology & Environmental Science, Assam University, Silchar.

Chapter 1

1.1. Introduction

Nature represents an invaluable gift bestowed upon all living creatures. Disturbances in nature lead to grave environmental concerns which are gradually escalating with the rapid growth of industrialization and urbanization across the globe. The unregulated exploitation of resources is subjecting Mother Earth to considerable strain, resulting in a significant temperature surge. Thus, it is crucial at this juncture to conscientiously manage this resource depletion in order to ensure preservation of these precious assets for future generations. The concept of Sustainable Development has attracted global attention as a means of safeguarding natural resources. Prudent utilization of Earth's resources combined with the periodical assessment of environmental components can play a pivotal role in conserving and protecting these valuable resources. Thus, environmental audits were first introduced in the early 1970s as a viable mechanism for addressing these challenges, entailing legal measures for violations of environmental protocols.

The foundation of a nation's progress lies within its educational institutions. And, the concept of Green Audit is also extended to these institutions as well. It is a means of assessing environmental performance (Welford, 2002). Green Audit is assigned to the Criteria 7 of NAAC (The National Assessment and Accreditation Council). NAAC has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green Audit Report. Presently, educational institutions are increasingly attuned to environmental considerations, introducing various approaches to cultivate eco-friendly environments. Some of these measures include energy conservation, proper waste management, bio-diversity conservation, encouraging plantation and cleanliness drives, adopting rain water harvesting systems etc. Despite all these affirmative actions, there are many activities undertaken by colleges consciously or unconsciously, which have negative consequences on the environment. Green audits help in pinpointing those negative areas, providing guidance for their effective management. In case of colleges, environmental audits offer a valuable avenue to identify areas of high energy, water or resource usage followed by suggesting means of corrective measures. Moreover, these audits also shed light on waste types and quantities and effective strategies for their management etc. This approach not only benefits the institution itself, but also extends to the larger context, contributing positively to the environment, the learning experience, and overall health awareness. It fosters a sense of environmental responsibility, ethical values and awareness among students and employees, while also enhancing their understanding of the requirement of a Green Campus and ensuring their contribution towards the reduction of Carbon Footprint.

1.1.1. Objectives of Green Audit

The aims and advantages of implementing an eco-auditing system include:

- Promotion of environmental learning via structured environmental management practice.
- Benchmarking the environmental conservation drives.
- Fostering sustainable consumption of natural resource inside the college campus.
- Bio-diversity conservation.
- Augmentation of academic experience through practical engagement.
- Cultivation of accountability and social responsibility for the campus and its ecology.
- Inculcation of ethical values and morals related to environment amongst the emerging minds.
- Identification of gaps and act on the suggestions and recommendations to improve the Green Campus status of the institution.

1.1.2. Overview of Karimganj College, Assam

Karimganj College is a premier co-educational institution affiliated to Assam University, Silchar. It came into existence in 1946 as a result of the enthusiastic efforts and visionary leadership of some great minds of that era such as Late R. N. Aditya, Md. Eahya Khan Choudhury and Late Pramesh Chandra Bhattacharya. It was established with a devout vision to disseminate Higher Education in this remote corner of undivided India in the district of the then Sylhet which Tagore once depicted as "Sundari Sribhumi". In May 2021, this heritage educational institution completed 75 years of excellence.

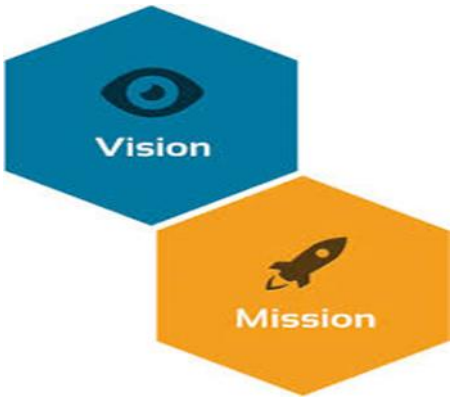
Spread over on a sprawling campus of 31,889 sq. metres in the heart of the town, with a built-up area of 6681 sq. metres and lush green open space of around 25, 208 sq. metres, Karimganj College offers undergraduate courses in 21 subjects across the three streams - Arts, Commerce and Science. This College also serves as Study Centres offering many UG and PG courses for IGNOU and KKHSOU. Karimganj College also runs Compulsory Computer Literacy Programme and several add-on/certificate courses to enhance the skill of students. Besides, this College also offers Professional Job Oriented Courses like NIELIT (DOEACC) "O" Level Course (Information Technology) and DOEACC CC BioInfo Course. The college has MOUs with other premier institutes of this region such as NIT Silchar, R K Nagar College etc to provide exposure to its students. Karimganj College has a highly dedicated faculty of 72 teachers (sanctioned and non-sanctioned faculty) and 46 non-teaching

staff (sanctioned and non-sanctioned). At present, there are 3300 students enrolled in the College. The College has 35 well-equipped undergraduate labs in the college (9 Physics Lab, 7 Chemistry Lab, 8 Biology Lab, 2 Zoology lab, 1 Geology lab, 1 Ecology and Environmental Science lab, 2 statistics lab, 1 Mathematics Lab, 3 Computer Science and Application Lab and 1 Commerce lab). The College library is automated and has Del net subscription. It has 33647 books and has subscription of 6 peer reviewed journals on diverse subjects.

The college is a Wi-Fi zone with internet access to every department and section. The entire college campus is under CCTV surveillance. New Arts building is equipped with a smart class room with latest ICT facility. The college ensures remedial classes for slow learners. Provision of FEE WAIVER scheme under Pragyan Bharti as per Govt. guidelines is also there for the needy students. Besides, the college has a SC/ST Cell. The College makes every effort to provide barrier free mobility to all PwD students everywhere in the campus. Ramps and signage on passages have been provided at all possible places. Due to unavoidable circumstances, where 100% barrier free mobility cannot be assured, classes for PWD students are conducted on the ground floor to cause minimum inconvenience to them. College provides inclusive environment for all round development of its students.

1.1.3. Karimganj College

Vision | Mission



Karimganj College, established in 1946 is one of the pioneering colleges of Assam, affiliated to Assam University, Silchar. Located alongside the Kushiara River, demarcating the Indo – Bangladesh territory, this college has been a prominent contributor to the cause of higher education in this part of the region for the past 7.5 decades. This College provides a dynamic and evolving environment where students are encouraged to thrive in their respective fields and also contribute positively to the society.

VISION

- To promote the cause of education in its highest and widest sense.
- To foster feeling of brotherhood and fellowship among different section of students and to inculcate values of liberal humanism, the values of individual liberty, equality, rationality, secularism and democracy.
- To provide quality education.

MISSION

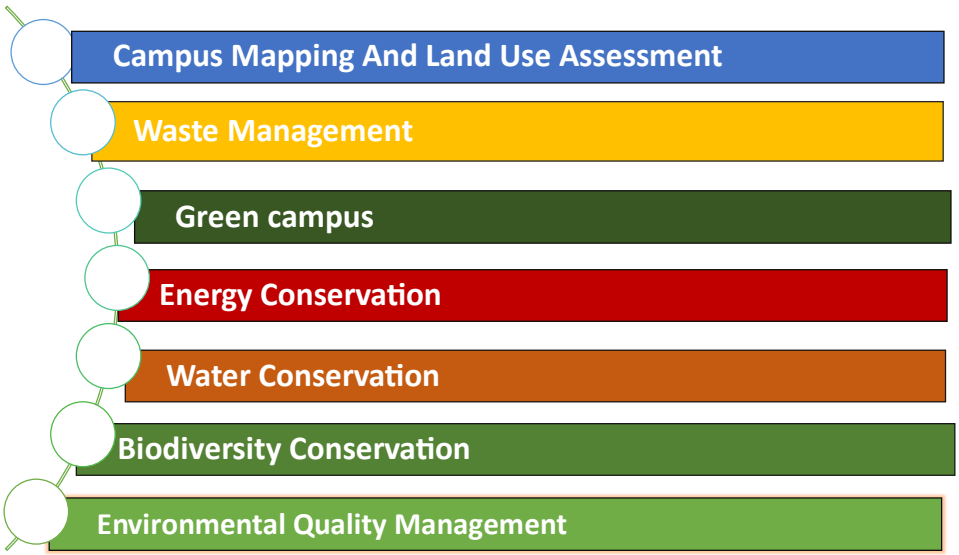
- To develop three H's- head, heart and hand-increasing knowledge refining feeling and imparting practical sense and skill with a mission to turn up new men and women for the new times to come.
- To make arrangements for giving education in all branches of studies, to establish the departments of Arts, Science, Commerce, Technology, Vocational training and courses of studies which open up career opportunities and to raise the status of the institution.
- To do all such things which are ancillary or incidental to the attainment of all or any of the above objectives, which may be conducive to welfare of the students and the interest of the society.

Chapter 2

2.1. Executive Summary

The Environmental audit is a snapshot in time, assessing the college campus's adherence to eco-friendly initiatives. Although an important benchmark, its significance wanes swiftly unless a mechanism is established which ensures continuous monitoring of environmental complaisance. Our strategy focuses on nurturing a Green campus to instill enduring sustainable values in students which will resonate in their future pursuits. A Green campus embodies the fusion of environment conscious practices and educational initiatives aimed at promoting sustainability within the campus surroundings.

This is the first Green Audit of Karimganj College, Assam. The audit criterion encompasses landuse analysis, environmental awareness, efficient waste management, biodiversity conservation, water conservation, energy conservation and air quality management. This audit report contains observations and recommendations designed to enhance environmental awareness and consciousness.



2.2. Methodology

The methodology include: preparation of questionnaire, physical inspection of the campus, interviewing stakeholders, observation of the implementation and review of the documentation, measurements, data analysis and recommendations.

Chapter 3

3.1. Green Audit Analysis

Green audit analysis refers to analysis of the data sets collected in the organization which reflect the ongoing processes of the organization and identify errors and deviations so that these can be rectified at the earliest.

3.1.1. Campus mapping and land use assessment

The college campus is built up on a flat terrain in the heart of the town Karimganj, sprawling across an area of 7.880 acres (31,889 sq. metres) approximately. The geographical coordinates of the campus are latitude 24.866884º N and longitude 92.367137º E. It also owns land of around ˙33 acres in the Amborkhana village of Karimganj district. The present campus is surrounded all around by residential and commercial establishments and a busy National Highway NH 151 on the east. A Google map of the College and a detailed master plan of the College has been depicted in Fig 1 and 2 respectively. Master plan contains detailed information about the campus's layout, buildings, infrastructure and other relevant features. The land use land cover data of the campus is illustrated in Tables 1, 2 and 3.

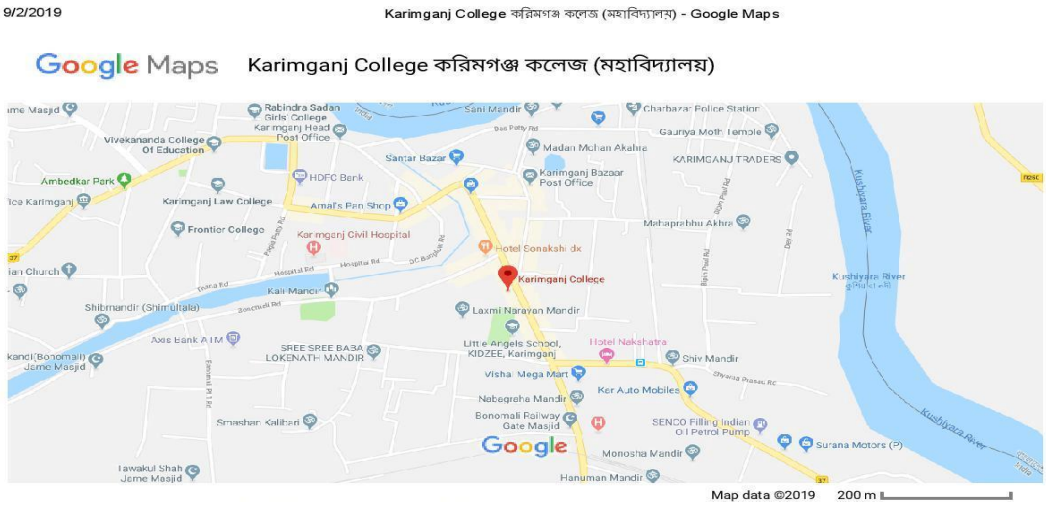


Fig 1. Google Map – Satellite View of Karimganj College Campus

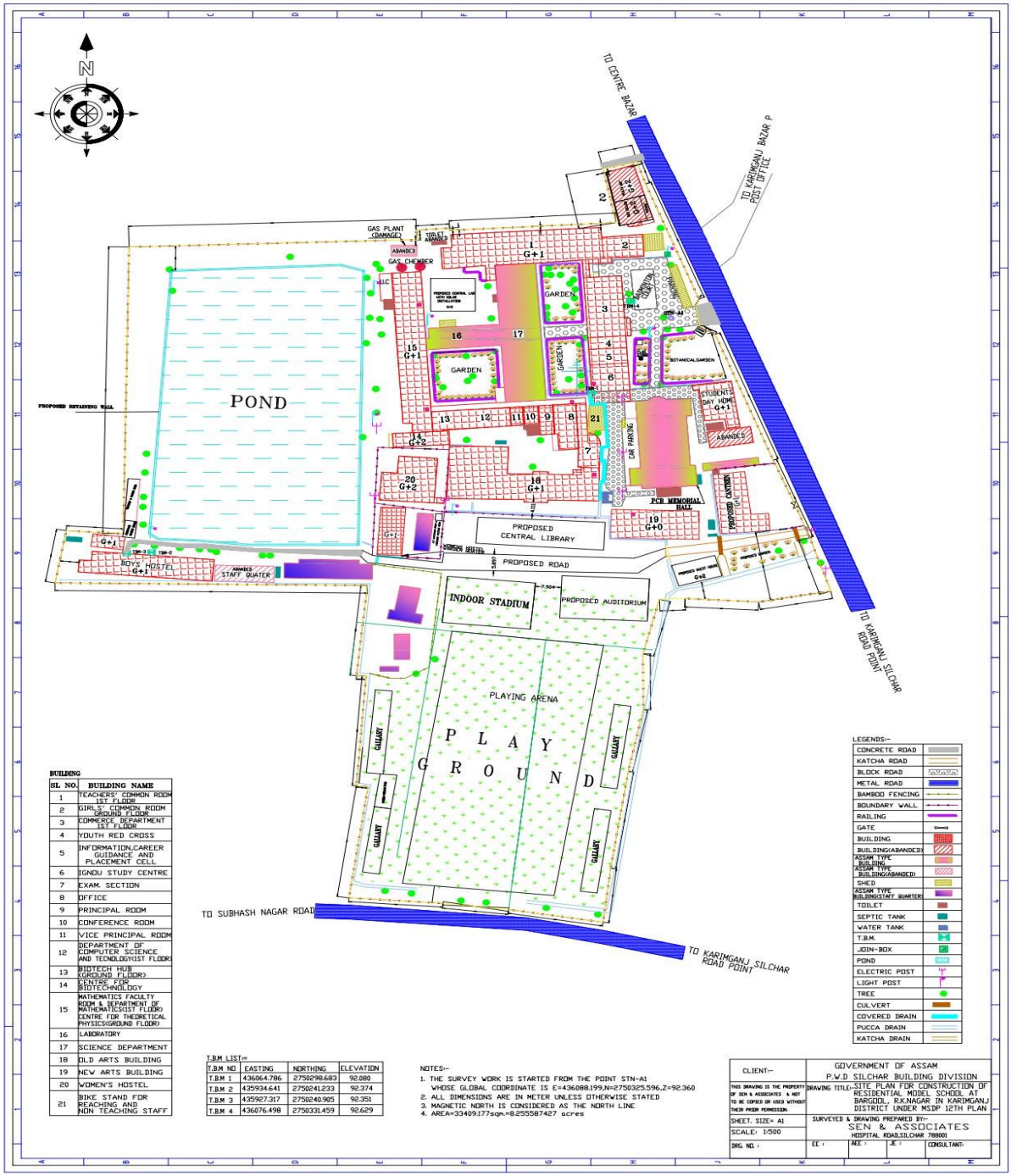


Fig 2: Site and master plan of Karimganj College

Table 1: Land Use statistics of Karimganj College Campus, Assam

Categories of land use	Area in sq. meters (Approx)	Percentage of area (approx.)
Built up area	6681	21%
Open space	25,208	79%
Total	**31,889**	

Table 2: Built up area land analysis of Karimganj College, Assam

Categories of land use	Area in sq. meters (Approx)
Main faculty building with administrative block	292
New arts building	268
Commerce building	465
Old Arts building	173
Science building	1955
Library	427
Career Counselling and Environmental Cell, ICGC etc	32
Auditorium	556
NCC	594
Cycle stand	40
Canteen	24
Boys common room	130
GYM	46
Girls hostel	183
Boys hostel	341
Faculty and Staff quarters	344
Boys hostel warden's quarter	153
Girls hostel warden's quarter	59
Boys Toilet	24
Abandoned building	575
TOTAL	**6681**

Table 3: Open space analysis of Karimganj College, Assam

Categories of land use	Area in sq. meters (Approx)	Percentage (%) of total land use (approx.)
College pond	6536	20.4
College field	9625	30.1
Garden area	872	2.7
Others	8175	25.63
TOTAL	**25,208**	

The total area of the present campus is 31,889 sq. metres, of which the built-up area constitutes about 21% of the area. The open space constitutes the College field, pond, garden and the lush green lawns. Apart from that, it also contains the internal pavements and parking space. The built-up area constitutes the administrative and academic buildings, library, Examination zones, Auditorium, hostels, faculty and staff quarters, canteen etc.

The College boasts of a pond which accounts for almost 20.4% of the total area. This pond also houses a wide variety of fishes which helps in earning revenue for the College. Apart from that, the College also owns a field occupying 30.1% of the total area. Moreover, the garden and the lush green space constitutes about 2.7% of the total area, however, the College has a plan of extending the green belt cover by another 950 sq. metres in near future.

3.1.2. Waste Management

Prior to formulating effective waste management plans, institutions must first identify the types of wastes generated in the campus. Here is a compilation of the various types of wastes frequently produced in Karimganj College campus along with their management strategies.

Types of Wastes Generated	Source	Reason	Quantity generated (kg) (approx.)	Management strategies
a) Solid Waste (Biodegradable)				
i) Food Waste	• Canteen, hostel mess and Faculty & Staff Quarters. • Food scraps like vegetable peels, fruits peels etc.	• Due to over purchasing of food from canteen. • Due to over piling of food in plates in hostel mess, although full.	200 kgs (monthly)	**a) Creating Awareness** Generating awareness against food wastage through lectures, sticking "No Food Wastage" quotations in college canteen and hostel mess. **(Photographs attached in Annexure I, pg no 87)** **b) Vermi Composting** Food scraps (vegetable and fruit peels, coffee filters, used tea leaves and a part of wasted cooked food) and other biodegradable wastes are initially collected in colour coded bins and then put in Compost Tank of College for vermicomposting. The prepared vermicompost is used as fertilizer in College Gardens. **(Photographs of Vermicompost tank attached in Annexure I, pg no 87)**

ii) Paper, Cardboard, paper cups etc.	• College Office, Classrooms, Library, Canteen, Hostels, Faculty & Staff Quarters	• Papers Generated as handwritten notes, answer sheets, office work etc. • Cardboard boxes generated as shipment packaging of different equipments, chemicals etc.	120 kgs (monthly)	**a) Minimising use of paper:** • through ICT based teaching learning process. **(Photographs attached in Annexure I, pg no 87)** • Through digitalisation ➢ Teachers' Work Diary is maintained through a Mobile App. **b)** Cardboard boxes are placed in College Office to collect used/ waste papers. **c) Recycling** • Reuse of one-side used paper is encouraged among students, faculties, and office staffs. • Quotes explaining the importance of recycling is pasted throughout the campus. • Every year incoming students are educated about the importance of recycling during the Students Induction Programme and Freshers Programme. **(Photographs attached in Annexure I, pg no 87)**
iii) Books/ Magazines/ Newspapers	• Library • At times, Obsolete textbooks result into solid waste generation as a result of course upgradation to new editions.			• Books Donation programme • Sold to Reseller **(Photographs attached in Annexure I, pg no 88)**

<table>
<tr><td colspan="3">File description</td><td>Document</td></tr>
<tr><td colspan="3">Records of Free Book Distribution Programme</td><td>View file 1</td></tr>
<tr><td>iv) Furniture Waste</td><td>• Classrooms & Labs
• Office
• Hostels
• Library
• Departmental Rooms</td><td>Broken desks, benches, tables, chairs etc.</td><td>~500 kgs (annually)</td><td>a) Usable furniture wood is used as barricade frames for gardens, construction of wooden frames etc.

b) Unusable furnitures are sold to junk dealer.

(Photographs attached in Annexure I, pg no 88)</td></tr>
<tr><td colspan="4">b) Solid Waste (Non-biodegradable)</td></tr>
<tr><td>Plastics, Sanitary napkins, Office Stationery Items.

Demolition and construction waste</td><td>• College Campus
• Boys and Girls Hostel
• Faculty & Staff Quarters

• College Campus, hostels and quarters</td><td>Generated as a result of regular day to day life activities.

Generated as a result building construction and demolition activities.</td><td>~ 100 kgs

-</td><td>a) Ban on Single use Plastic
Complete ban on use of single use plastics viz., plastic water bottles and other plastic disposables like knives, forks etc. inside the College Campus.
<table><tr><td>File description</td><td>Document</td></tr><tr><td>Notice regarding ban on single use plastics</td><td>View file 2</td></tr></table>b) Construction and demolition wastes are used for filling/leveling of low-lying areas (Photographs attached in Annexure I, pg. no 88)</td></tr>
</table>

				c) Disposal of Sanitary Napkin Sanitary Napkins are disposed through Incinerator Machine installed in Girls Common Room of Karimganj College. **(Photographs attached in Annexure I, pg. no 88)** **d) Other Non-Biodegradable Wastes:** Other plastic items, scraps etc. are initially disposed in colour coded waste bins installed at different sites in college campus and hostels. These are then discarded in the central dustbin located in College Field and from there it is collected by the Municipal Board, Karimganj weekly. **(Photographs is attached in Annexure I, pg. no 88)**
c) E-waste	• College Office • Computer Labs • Different departments. • College Hostel.	• Old and damaged computers, laptops, phones, printers etc.	<2kg	**a) E-waste Collection Centre** These wastes are initially stored in a separate room meant for E-waste. **(Photographs attached in Annexure I, pg. no 89)** **b) Recycling** College has tie up with External agency for buy back.
File description				**Document**
MOU relating to E-waste management				**View 3.a. and 3.b.**

e) Horticulture Waste	• College Gardens	• Dried leaves, flowers, and other plant parts	~45 to 50 kgs (monthly)	• Dried Leaves, flowers and other plant parts etc. are used in vermicomposting. • College Gardens are managed through this in-house composting system.
f) Laboratory Waste				
Chemical Waste (Solid)				
• Different Laboratories of the College especially Department of Chemistry Laboratories.		Broken Glasswares	< 1 kg (monthly)	• A **Solid Chemical Waste Tank** is constructed with a vision of a period of 10 years. **(Photographs attached in Annexure I, pg. no 89)**
Chemical Waste (Liquid)				
• Different Laboratories of the College especially Department of Chemistry Laboratories.		Wastewater containing chemicals. Solvents etc.	Varies	• **Non-chlorinated solvent** Used non-chlorinated solvents are stored in jars, year marked and preserved in **Solvent Waste Room** in the Department of Chemistry for disposal in future as and when proper solvent waste management technique is developed in campus or in nearby locality.

			• **Functionalized Organic compounds and heavy metals.** Instead of disposing in sinks, these are collected in jars kept in laboratories and then disposed in the **Chemical Waste tank** constructed with proper filtration techniques containing layers of sand, stones and charcoal. ➢ Functionalized organic compounds will decompose naturally due to aerial oxidation. ➢ Metal enriched charcoals will be handed over to any Centre, if emerges in future when the tank gets saturated after a period of 7 to 10 years. Otherwise, these will go for deep burial. **(Photographs attached in Annexure I, pg. no 89)**
Chemical waste (Gaseous)			
• Department of Chemistry Laboratories	Generated as a result of acid fumes and other experiments.	----	• Adequate number of exhaust fans are installed in different laboratories of the Department. • A manually constructed fume hood chamber is installed in the Laboratory. • Taken initiatives to set up fume cupboard in other laboratories as well.

Bio-waste			
• Department of Botany, Zoology, Biotechnology and Research Labs of AIBH, Karimganj College.	Different experiments	Varies	• The microbial wastes are first autoclaved and then deeply buried in the Bio-waste tank. • Other bio-wastes are disposed off in the Bio-waste tank. **(Photographs attached in Annexure I, pg. no 89)**

3.1.3. Green Campus

- Karimganj College, Assam has a total land area of about 31,889 sq. metres. The Campus has a few gardens and green lawns comprising of about 872 sq metre area, i.e about 2.7% of the total space is covered by gardens, trees and lawns.

- The College also plans to extend the green belt cover by about 950 sq. metres in the coming days which will harbour the Herbal and Medicinal plant garden as well as the kitchen garden.

- The students of the College also play an active role in maintaining these gardens. Interested students spend around 2-4 hours time weekly for this purpose. **(Photographs attached in Annexure II, Page No 90)**

- The College boasts of a vast number of trees and semi grown trees within the campus. It owns approximately 102 numbers of full-grown trees, 60 semi grown trees, 2500 hedge plants and 625 sq metres. area of grass cover.

- The College does have a Beautification and Plantation Committee which regularly works for the development of the gardens.

File Description	Document
Beautification and Plantation Committee	View File 4

- Regular plantation drives are carried out in the College campus through the initiatives of Beautification and Plantation Committee, Eco Club, Environment and Climate Cell, NSS Unit and NCC.

File Description	Document
List of plantation programme	View File 5

- Plants Distribution Programmes are also carried out among students and in the community. Saplings are distributed among students for plantation in their home garden. The College also distributes plant saplings in the schools and households of the adopted village Karnamadhu, Karimganj. Moreover, saplings are given as gifts to welcome guests on various occasions in the college. **(Photographs attached in Annexure II, Page No 90)**

- Important events like Earth Day, World Environment Day, Ozone Day etc. are celebrated in the College every year through different activities like plantation and

cleanliness drives in campus and in community, plant distribution programmes, conducting awareness programmes on conservation of natural resources etc.

File Description	Document
List of celebration of important events	View File 6

3.1.4. Energy Conservation

Energy audit in an institution is an important approach for proper energy management. According to Energy Conservation Act, 2011, "Energy audit" means the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption". In this report, a brief overview of the energy consumption and conservation strategies is depicted. The detailed report on the same is provided in the Energy Audit Report.

i) Electricity and energy audit

Main energy source in our campus is electricity of Assam Power Distribution Company Ltd (APDCL). Liquid petroleum and LPG are also used as energy sources inside the college campus. There is provision of uninterrupted power supply from inverters in different departments. Apart from that the College has a diesel generator (62.5 KV) which supplies electricity to all sections of the college when required. Besides this, there is a provision of generating electricity from solar energy source inside campus. A 10 KWp Solar Plant is installed at the roof top of library building of the college to meet a small fraction of power requirement of college through solar energy. Gradually solar panels of increased capacity will be installed to increase the contribution of renewable energy.

File Description	Document
List of common electrical appliances in different departments/ rooms, electrical energy consumption in college by common electrical appliances and electrical energy consumption in college by electricity operated laboratory equipment	View File 7

Table 4: Summary of electricity consumption in college

Category	Energy consumed per month (kWh)	Average energy consumed per day (kWh)
Common electrical appliances	15938.01	531.27
Laboratory equipment	1349.88	44.99
TOTAL	**17287.89**	**576.26**

ii) Energy saving methods employed in college

- College has initiated the replacement of high energy demanding tube lights and bulbs by LED.
- Switching off lights, fans and other electrical appliances when they are not in use messages are displayed at different sites inside the campus and are also followed.
- Optimising usage of sun light during daytime.
- Boards/ stickers displayed throughout the college campus to create awareness on energy saving (**Photographs attached in Annexure II, Page No 90**).

3.1.5. Water Conservation

Water is a precious natural resource essential for all living beings and its availability varies depending on a region's climate and geographical features. Although water is abundant in nature, but access to potable water is not readily available always. Despite 70% of the Earth's surface being covered by water, only a small fraction i.e. 3% is fresh water. Approximately 1.1 billion population across the globe are grappling with water scarcity issues. And the main culprits behind this are water pollution and wastage which are occurring at an alarming rate. Consumption of contaminated water can result in several diseases and even death. Hence, ensuring clean and safe drinking water is of utmost importance.

Moreover, it is our moral responsibility and the need of the hour to implement strict measures to conserve, safeguard and manage the water resource to ensure its sustainable use. In this regard, Karimganj College takes proactive steps by scrutinizing the quality and utilization of water within the campus. This water audit is done to evaluate the quality of drinking water

and also to determine the processes that can be implemented to ensure sustainability of this natural resource.

i) Water sources, uses and management

Table 5: Water sources and uses

Sl. No.	Source	Nos	Point of Entry of water	Uses	Point of exit of waste water
1.	PHE water		Flows into the reservoir near Arts Building, Karimganj College.	Drinking and cooking purpose	Mainly through two proper drainage systems which connects the municipality drains.
2.	Pond	01	Backyard of the College campus near staff quarters.	Laboratories, toilets, gardening, construction activities, cleaning purposes, household activities like washing, bathing etc. in College hostels and staff quarters.	
3.	Submersible Pump	04	a) Main campus b) Girls' Hostel c) Boys' Hostel d) Staff quarter	Drinking, cooking and a few other activities in College campus, hostels and staff quarters.	
4.	Tube-wells	03	Not in working condition	-------	

Table 6: Quantity of water used/day (in Litres)

Sl. No.	Sites	Water used in litres/day (approx.)
1.	**Main Campus** • Drinking water	10,000
	• Laboratories	1500
	• Toilets	8000
	• Cleanliness	5000
	• Gardening	1500
	• Canteen	1000
	• Construction	1000 (on an average)
	Total (Main Campus)	28,000
2.	**Faculty & Staff Quarters**	5000
3.	**Hostels** • Girls' Hostel • Boys' Hostel	 5000 7000
	TOTAL	**45,000**

ii) Other related information on water usage (College & Hostel)

a) Number of water filters installed in the College: 06
   i. Main Campus: 03
   ii. Hostels and quarters: 03

**In addition to the above, many small sized water filters are installed in different departments of the College.

b) Number of toilets and urinals in the College: 43
   i. Staff rooms and Departments: 20
   ii. Auditorium: 03
   iii. Girls' & Boys' Common Room: 14
   iv. Hostels: 06

c) Number of toilets and urinals without water supply: Nil
d) Number of water taps: 127

e) Number of reservoirs for water storage: 01 (7000 litres capacity)
f) Number of overhead tanks: 13 (around 1000 to 2000 litres capacity)

iii) Water Quality Analysis

In order to assess the water quality of the various water sources of college campus, water samples were collected from five sources viz., Pond water, submersible pump in campus, drinking water near College auditorium and College office, and Girls' hostel submersible pump. The collected water samples were analysed in the PHE Lab, Karimganj, Assam. The results were obtained in respect of 17 water quality parameters. It is found that the quality status of water of these five sources in the campus is within the permissible limits as per IS 3025.

File description	Document
Water analysis report by PHE LAB, Karimganj	View File 8

iv) Water resource Management

a) Water pipes and connections are regularly checked and repaired to prevent leakage.

File description	Document
Water pipes and connections repairing bills	View File 9

b) **Sensors** are installed in overhead tanks to prevent overflow of water. **(Photographs attached in Annexure III, pg no 91)**

c) **Rain water harvesting** is done naturally through the College Pond **(Photographs attached in Annexure III, pg no 91)**. College has one Ground Water Recharge Pit near new Arts building to replenish groundwater. **(Photographs attached in Annexure III, pg no 91)** Apart from this, the College is also planning to set up rain water harvesting unit in the Campus for ground water recharge and day to day activities as well.

File description	Document
Letter to PHE for setting up of rainwater harvesting system	View File 10

d) Incoming students are sensitized on water conservation necessities and management every year during Students Induction and Freshers programme. Also, awareness programmes on water conservation are also carried out regularly.

e) Messages and quotes on Water Conservation and instructions to Turn off the water taps after use and to avoid overuse is pasted in the toilets, near drinking water facilities etc. **(Photographs attached in Annexure III, pg no 91)**

f) Sprinklers are used to prevent over usage of watering in gardens. **(Photographs attached in Annexure III, pg no 91)**

g) Cleaning of overhead tanks and reservoir is done to ensure safe and clean drinking water. **(Photographs attached in Annexure III, pg no 91)**

3.1.6. Environmental Quality Management

i) Evaluation of air quality and pollution levels

In order to evaluate the air quality and pollution levels in Karimganj College campus, secondary data available from online sources for Karimganj area for the period 2017-2022 has been used. This data is collected for both summer and winter seasons.

(Ref: https://www.worldweatheronline.com)

Table 7: Air Quality Data in Karimganj

Location: Karimganj College Campus	**Parameters**	**Data**	
		Summer (April-Sept)	**Winter (Oct-March)**
	Average Temperature (℃)	27.5	22.8
	Average Rainfall (mm)	434.89	77.48
	Average wind speed (kmph)	3.76	4.87
	Average Pressure (mb)	1005.45	1013.25
	Average Humidity (%)	63.31	79.82
	Average Visibility (km)	8.71	9.74

The Real time air quality data (as on 03/04/23 & 04/04/23) showing the concentration of different pollutants in atmosphere as per the Central Pollution Control Board, Govt. of India

in Tarapur, Silchar-PCBA station is summarized below. Considering the fact that the College is located at a short distance of around 55 km from Silchar, it is expected that the concentration of these pollutants in the College campus will not deviate much from the reported values.

Table 8: Pollution levels data of 3rd & 4th April' 2023 in Karimganj district

Station: Tarapur, Silchar-PCBA	**Pollutants**	**Levels (as on 03/04/23) (24 hr average) (approx.)**	**Levels (as on 04/04/23) (24 hr average) (approx.)**	**Permissible Limits as per Central Pollution Control Board, Govt. of India (for 24 hrs)**
	PM_{10}	~ 13.58 µg/m^3	~ 25.153 µg/m^3	100 µg/m^3
	$PM_{2.5}$ (Main Pollutant)	~ 3.10 µg/m^3	~ 3.32 µg/m^3	60 µg/m^3
	NO_2	~ 9.424 µg/m^3	~ 9.599 µg/m^3	80 µg/m^3
	NO	~ 0.986 µg/m^3	~ 1.627 µg/m^3	
	SO_2	~ 6.580 µg/m^3	~ 4.875 µg/m^3	80 µg/m^3
	CO	~ 1.044 mg/m^3 (*8hrs)	~ 0.866 mg/m^3 (*8hrs)	02mg/m^3 (*8hrs)
	O_3	~ 2.504 µg/m^3 (*8hrs)	~ 2.082 µg/m^3 (*8hrs)	100µg/m^3(*8hrs)
	Benzene	~ 1.629 µg/m^3	~ 2.155 µg/m^3	05µg/m^3(Annual)

As per the notifications on National Ambient Air Quality Standards published by the Central Pollution Control Board in the Gazette of India, dated 18th November, 2009, if on two consecutive days of monitoring, the results exceed the specified values for the respective category, then it shall be considered as adequate reason for regular or continuous monitoring and further investigation.

Table 9. Air Quality Index data of the 1st week of April'2023 in Tarapur, Silchar-PCBA

Location	**Date & Time (12.00 noon)**	**Air Quality Index (AQI)** (as per Central Pollution Control Board)	**Remarks** (as per Central Pollution Control Board)	**Possible Health Impact** (as per Central Pollution Control Board)
Location: Tarapur, Silchar-PCBA	01/04/23	~ 31	Good	Minimal Impact
	02/04/23	~ 44		
	03/04/23	~ 51		
	04/04/23	~ 42		
	05/04/23	~ 25		
	06/04/23	~ 27		
	07/04/23	~36		

Since the concentration of different pollutants did not exceed the permissible limits for any category (**Table 8**) and the air quality index data (**Table 9**) also in green zone as per Central Pollution Control Board, Govt. of India, hence the air quality in the campus area can be declared as safe.

Moreover, the College has well-ventilated rooms with very good window floor ratio which results in ample daylight utilization for different activities. The College also does not own any vehicles. However, many faculties and students owned vehicles enter the campus every day.

Following are the measures adopted by the College to keep the air quality clean.

i) Students and staffs are encouraged to use public transportation and carpooling as much as possible.
ii) Regular Tree plantation drives.
iii) Ensuring valid PUC certification for all vehicles entering the campus.
iv) Tobacco usage (any form) is banned in the College Campus.

File description	Document
Notices relating to ban on tobacco use inside the College Campus	View File 11.a. and 11.b.

ii) Assessment of noise levels inside the Karimganj College Campus

Environmental Pollution, as acknowledged in the Air (Prevention and Control of Pollution) Act, 1981 of the Government of India includes noise pollution. These pollution levels are evaluated in two scenarios: (i) Residential areas and (ii) Industrial areas. According to WHO guidelines, permissible noise levels in residential areas should not exceed 30 decibels (dB). In classrooms, the recommended noise level should be below 35 dB in order to create an ideal and conducive teaching-learning process.

In order to assess noise pollution inside the college campus, a survey was conducted at different sites inside the college campus during the working hours of 07/09/2023. The data has been tabulated as follows:

Table: 10 Noise levels at different sites in the Karimganj College Campus

Survey Locations	Noise level in dB		Permissible noise limits (day hours) as per Central Pollution Control Board
	10 am - 12 noon	2 pm - 4 pm	
i) College Main Gate	85.3	93.2	For silence zone (i.e hospitals, schools, colleges etc.), recommended level=50 dB For residential areas, recommended level= 55dB For commercial areas, recommended level – 65 dB
ii) Boys Common room	57.2	54.4	
iii) Girls Common Room	66.3	67.8	
iv) Teachers Common Room	53.4	52.1	
v) College Office	66.5	61.2	
vi) Arts Building	55.2	60.8	
vii) Science Building	53.8	58.9	
viii) Commerce Building	61.2	68.4	
ix) Principal's Room	54.4	52.6	
x) Girls Hostel	56.5	54.7	
xi) Boys Hostel	58.5	55.8	
xii) College Field	51	53.4	
xiii) Canteen	63.2	69.8	

The noise level is found to be very high i.e of the order of 85.3 – 93.2 dB at the College Main Gate due to the proximity of the college from the National Highway NH 151 (~ 2 to 3 m distance) and the residential and commercial establishments nearby. This high noise level is due to the highly dense traffic in NH 151. In the mid-campus lies the academic and administrative buildings and thus the noise level is a bit up to the tune of about 59.0 dB (on an average).

Noise Pollution Management inside the campus

a) Silence Zones inside the Campus

- Display boards creating awareness to maintain silence are placed at different sites inside the college campus. **(Photographs attached in Annexure IV, pg no. 92)**
- Certain areas such as Library, classrooms etc. are declared as Silence zones.
- No honking policy is maintained inside the campus **(Photographs attached in Annexure IV, pg no. 92)**

b) DG Set for Power Back up

- The College owns a DG set (Jakson JSPF -62.5, Noise limit <75 dB (A) at 1 MTR) with proper soundproof enclosures and conforming to the Environment (Protection) Rules 1986 as amended. **(Photographs attached in Annexure IV, pg no 92)**

iii) Assessment of soil quality inside the college campus

The soil quality in the College is good and fertile which helps in the growth and development of different types of plants such as shrubs, hedge plants, trees, flowering plants etc. These are alluvial soils containing good quantity of silt as the College fills up the gardens with silt every year. The pH of the soil is around 7.19. The organic carbon content of the soil is around 0.64% (Walkley-Black method) and the soil organic matter is found to be 1.1. The College does not use any form of chemical fertilizer or chemical pesticides in its gardens and thus the soil quality remains healthy. Organic manures, pests repellants, vermicompost, etc are used in the gardens.

3.1.7. Bio-diversity Conservation

The Karimganj College campus houses different varieties of floras and faunas which keeps the environment green and clean. The campus serves as a natural habitat for various species of insects, birds and other small animals. Different species of birds like blue-throated barbet, tailor bird etc. often make their nests in the campus area which indicates that the college campus has the potential to conserve these life forms **(Photographs attached in Annexure II, pg no. 90)**. Moreover, the fluttering butterflies and birds chirping imbue the campus with a serene and aesthetically pleasing atmosphere. The different species of floras and faunas existing in the campus are summarized in Table 11 (a-h) and Table 12 respectively.

Strategies adopted for biodiversity conservation in the Karimganj College campus

- Regular plantation and cleanliness drive to maintain the greenery inside the campus.
- No chemical fertilizers or pesticides are used in the campus as their usage might affect the biodiversity. Only organic manures, vermi composts and organic pesticides are used in the College gardens.
- Artificial nests and bird feeders are installed in the trees to attract birds, promoting bio-diversity.

Flora of Karimganj College, Karimganj

Table: 11 (a) List of tree species of Karimganj College

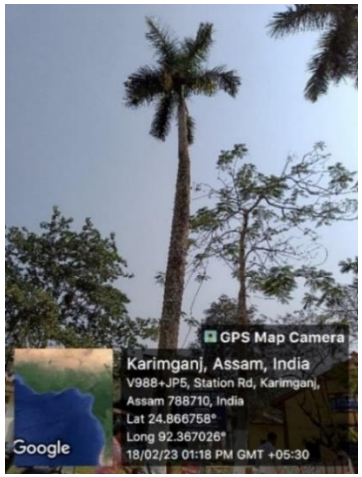
Sl. No	Common Name	Scientific name	Family	No.	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
1.	Sagu	*Metroxylon sagu* Rottb.	Arecaceae	3	lowland swamp forests or dry lands	Sago production, rafts preparation	-	Blooms once every 3-4 years	LC
2.	Supari, Betel nut	*Areca catechu* L.	Arecaceae	20	Paddy fields, marshes, cultivated	Edible nut, bowls making miniatures in decorations	-	Throughout the year	NA
3.	Christmas tree, Cook's pine	*Araucaria columnaris* (J.R. Frost.) Hook.	Araucariaceae	2	Humid subtropical climate	Decorative- indoor & outdoor	-	-	LC
4.	Aam, Mango	*Mangifera indica* L.	Anacardiaceae	20	Tropical well-drained sandy loam	Edible fruit, wood, religious	-	Late winter-early spring	DD
5.	Taal	*Borassus flabellifer* L.	Arecaceae	2	Wet tropical lands	Edible fruit, toddy or palm wine, palm-leaves bowl, ropes etc.	-	February-July	NA
6.	Kathal, Jackfruit	*Artocarpus heterophyllus* Lam.	Moraceae	5	Tropical lowlands	Edible fruits and seeds, as vegetable	-	December-February	NE
7.	Debdaru	*Monoon longifolium* Sonn. B. Xue & R.M.K. Saunders	Annonaceae	16	Tropical countries	Ornamental and medicinal	-	March & April	NA

Sl. No.	Common Name	Scientific name	Family	Nos.	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
8.	Guava, Peyara	*Psidium guajava* L.	Myrtaceae	6	Tropical countries	Edible fruit, traditional medicine, fodder	-	February & June	LC
9.	Aakashmani	*Acacia auriculiformis* A.Cunn. ex Benth.	Fabaceae	2	Native to Australia, Philippines, Indonesia, and Papua New Guinea	Ornamental, economic-food, fodder, wood etc.	-	December-January	LC
10.	Kadam	*Neolamarckia cadamba* (Roxb.) Bosser	Rubiaceae	5	Tropical tree native to South and Southeast Asia	Ornamental, timber, paper-making, flower in perfumes.	-	June-August	NE
11.	Boroi	*Ziziphus mauritiana* Lam.	Rhamnaceae	6	Subtropical, grows wild in forests and also on wastelands throughout the mid-hills	Edible fruits, woods as fuel	-	September - November	LC
12.	Krishnachura Gulmohar	*Delonix regia* (Hook.)Raf.	Fabaceae	10	Native to Indian subcontinent, Roadsides, cultivated	Ornamental	-	Flowering & Fruiting: March-October	LC

Sl. No.	Common Name	Scientific name	Family	Nos.	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
13.	Radhachura	*Caesalpinia pulcherrima* (L.) Sw.	Caesalpiniaceae	3	Native to Indian subcontinent, Roadsides, cultivated	Ornamental	-	Flowering & Fruiting: April-December	LC
14.	Arjun	*Terminalia arjuna* (Roxb.) Wight & Arn.	Combretaceae	1	Native to Indian subcontinent, cultivated	Ornamental, medicinal, Tusher silk production	-	April-June	NA
15.	Indian Siris, Raintree	*Albizia lebbeck* (L.) Benth.	Fabaceae	10	Native to Indian subcontinent and Myanmur, cultivated	Environmental management, forage, medicinal and wood	-	March-July	LC
16.	Shishu	*Dalbergia sissoo* Roxb.	Fabaceae	2	Afghanistan to India	Timber, fuel wood, medicinal, pesticide, construction	-	Rainy season	LC
17.	Weeping fig	*Ficus benjamina* L.	Moraceae	1	Tropical	Ornamental, medicinal	-	Late spring to early summer	LC
18.	Shegun, Teak	*Tectona grandis* L.f.	Verbenaceae	4	Native to India and Burma to Java, cultivated	Manufacturing furniture, fuel, bowls from leaves	-	Monsoon	Endan gered

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
19.	Black plum, Java plum, Kalojam	*Syzyzium cumini* (L.) Skeels.	Myrtaceae	2	Native to Indian subcontinent, South-east Asia, cultivated	Culinary, medicinal, religious	-	March - April.	LC
20.	Pink shower	*Cassia javanica*	Fabaceae	1	Terrestrial	Ornamental	-	April-May	LC
21.	Boyra	*Terminalia bellirica*	Combretaceae	1	Tropical, Indian sub-continent	Medicinal, food	-	June-August	LC
22.	Nageswar	*Mesua ferrea* L.	Callophylaceae	1	Tropical, subtropical	Wood, resin, oil, medicine, ornamental	-	April-June	NA
23.	Curry leaf tree	*Murraya koenigii* (L.) Sprengel	Rutaceae	5	Terrestrial	Culinary	-	March to August	-
24.	Chatim	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	5	Terrestrial	Medicinal	-	October	LC
25.	Amla	*Phyllanthus emblica* L.	Phyllanthaceae	2	Terrestrial	Edible and Medicinal	-	March to May	LC
26.	Dumbur	*Ficus hispida* L.f.	Moraceae	5	Terrestrial	Edible and Medicinal	-	June-July	LC
27.	Mangrove trumpet tree	*Dolichandrone spathacea* (L.f.) Seem.	Bignoniaceae.	2	Terrestrial	Traditional herbal medicine	-	-	-
28.	Lemon	*Citrus limon* (L.) Osbeck	Rutaceae	9	Terrestrial	Food and Medicinal	-	During the year	-

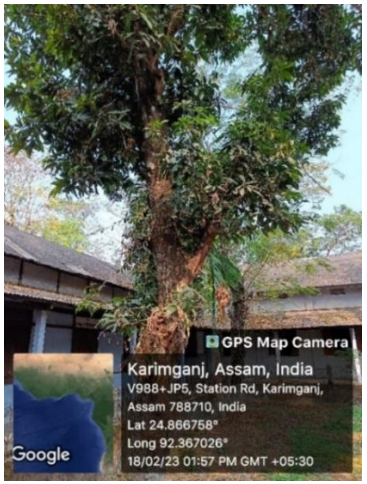
In column 8, '–' indicates the species is neither exotic nor invasive and in other columns, '–' indicates information is not available



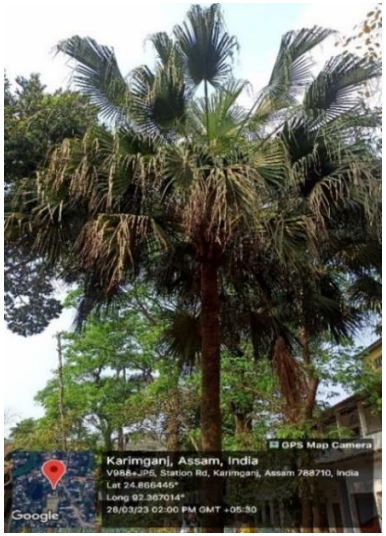
1. ***Metroxylon sagu*** **Rottb. (Sagu)**

2. ***Areca catechu*** **L. (Supari)**

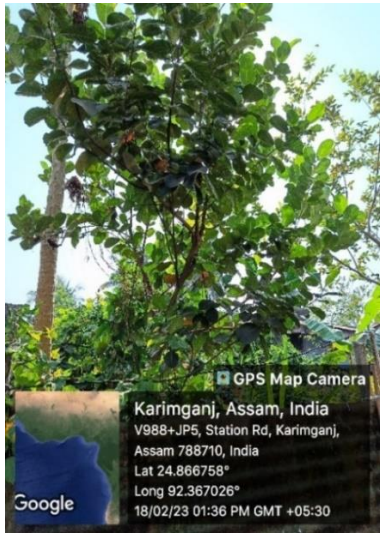
3. ***Araucaria columnaris*** **(J.R. Frost.) Hook. (Christmas tree)**



4.***Mangifera indica*** **L. (Aam)**

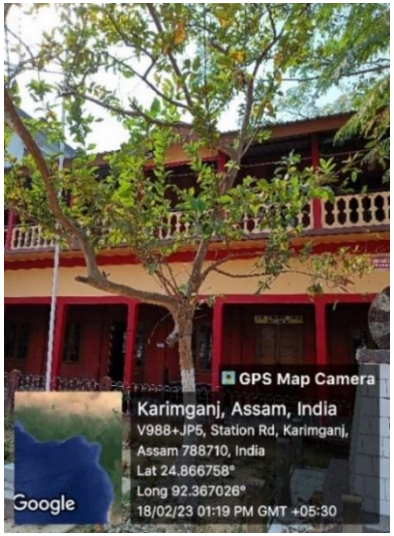


5.***Borassus flabellifer*** **L. (Taal)**

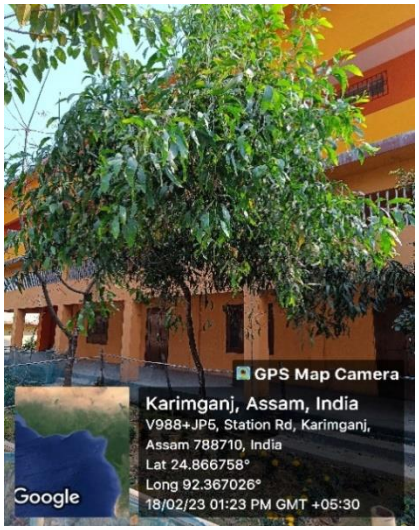


6.***Artocarpus heterophyllus*** **Lam. (Kathal)**

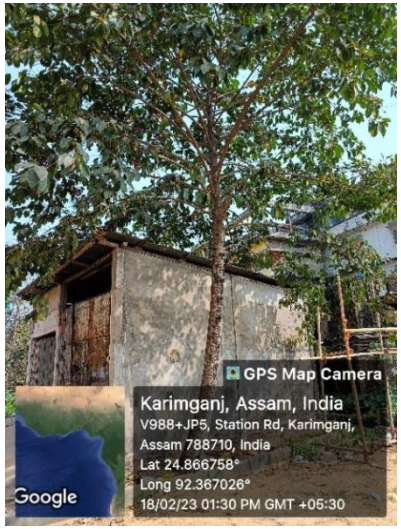
7.***Monoon longifolium*** **Sonn. B.Xue & R.M.K. Saunders (Debdaru)**



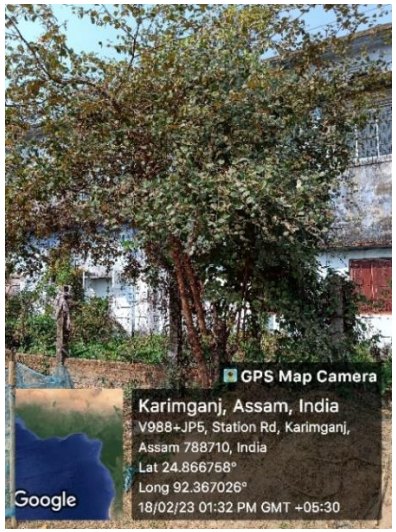
8.***Psidium guajava*** **L. (Peyara)**



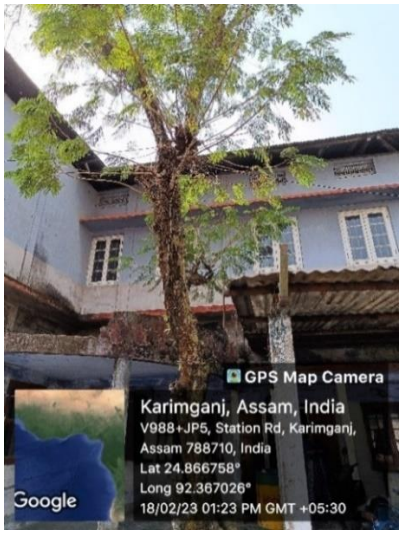
9. ***Acacia auriculiformis*** **A.Cunn. ex Benth (Aakashmani)**



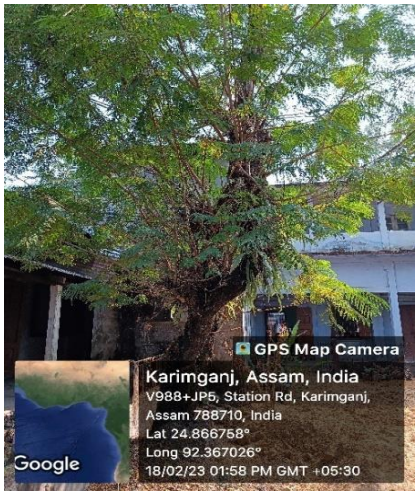
10. ***Neolamarckia cadamba*** **(Roxb.) Bosser (Kadam)**



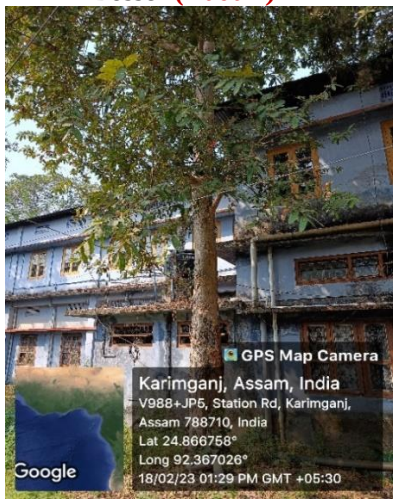
11. ***Ziziphus mauritiana*** **Lam. (Boroi)**



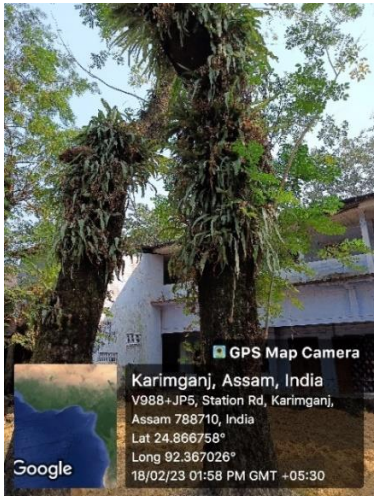
12. ***Detonix regia*** **(Hook.) Raf. (Krishnachura)**



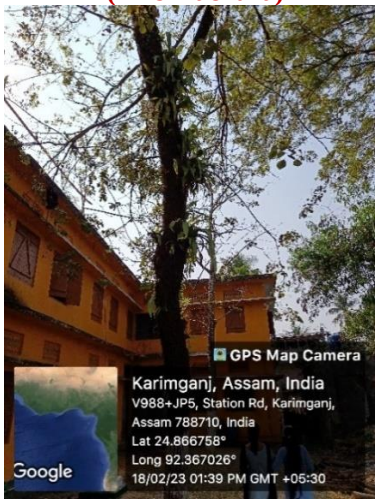
13. ***Caesalpinia pulcherrima*** **(L.) Sw. (Radhachura)**



14. ***Terminalia arjuna*** **(Roxb.) Wight** & Arn. **(Arjun)**

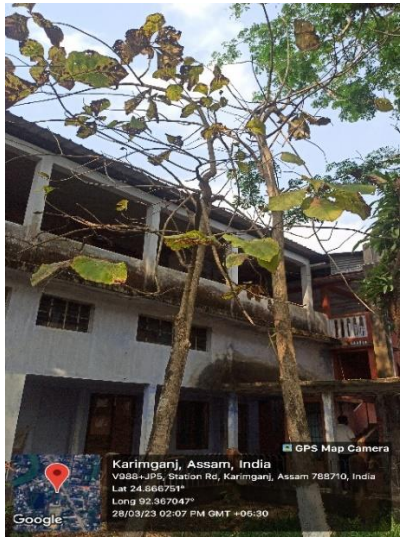


15. ***Albizia lebbeck*** **(L.) Benth. (Indian siris)**

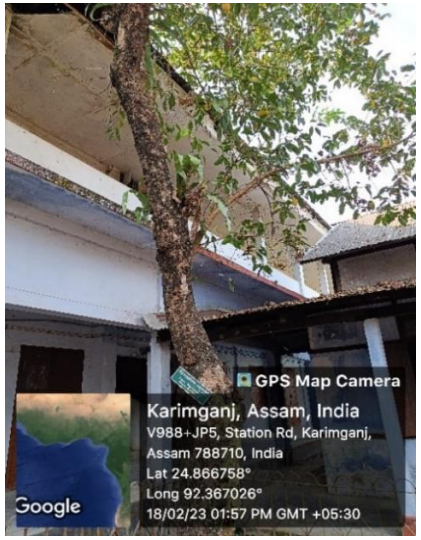


16. ***Dalbergia sissoo*** **Roxb. (Shishu)**

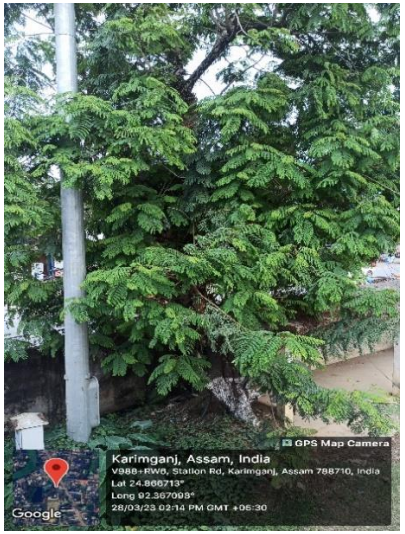
17. *Ficus benjamina* L. (Weeping fig)



18. *Tectona grandis* L.f. (Shegun)



19. *Syzyzium cumini* (L.) Skeels. (Kalojam)



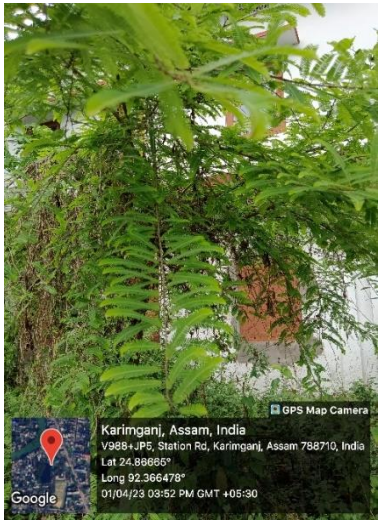
20. *Cassia javanica* (Pink shower)

21. *Terminalia bellirica* (Boyra)

22. *Mesua ferrea* L. (Nageswar)

23.*Murraya koenigii* (Curry leaf tree)

24. *Alstonia scholaris* (Chatim)



25. ***Phyllanthus emblica*** **(Amla)**

26. ***Ficus hispida*** **(Dumbur)**

27. ***Dolichandrone spathacea*** **(Mangrove Trumpet tree)**

28. ***Citrus limon*** **(Lemon)**

Table: 11 (b) List of shrub species of Karimganj College

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
1.	Tulsi	*Ocimum sanctum* L.	Lamiaceae	~20	Native throughout the tropical regions, cultivated	Religious, medicinal, ornamental, oil, alkaloids	-	September-march	NA
2.	Rose	*Rosa indica* L.	Rosaceae	~10	Native to China, Taiwan, Vietnam, widely cultivated in India	Ornamental, medicinal, oil, perfume, cosmetics	-	Throughout the year	NA
3.	Crape jasmine	*Tabernaemontana divaricata* R.Br. ex Roem. & Schult.	Apocyanaceae	4	native to South Asia, Southeast Asia and China	Flowering plants, alkaloids	-	appear sporadically all year	LC
4.	Sky flower, Nilkanta	*Duranta erecta* L.	Verbenaceae	~300	Native to tropical America, introduced in Southeast Asia	Ornamental hedge, garden plant	-	Summer	LC
5.	Indian hemp	*Crotalaria juncea* L.	Fabaceae	~30	Terrestrial	Traditional medicine	-	Late April	-
6.	Joba, China rose	*Hibiscus rosa-sinensis* L. (cultivar)	Malvaceae	~20	Native in tropical and subtropical countries, cultivated	Ornamental, medicinal, herbal folklore	-	Summer and autumn	-

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
7.	Patabahar	*Croton* sp.	Euphorbiaceae	~40	Native to tropical, subtropical countries	Ornamental	-	Summer	-
8.	Aralia	*Polyscias fruticose* (L.) Harms	Araliaceae	62	Cultivated in Southeast Asia, Medium humidity zone	Medicinal, ornamental	-	Summer	NE
9.	Tita begun, bhit tita	*Solanum torvum* Sw.	Solanaceae	6	Tropical regions	Culinary, medicinal	-	July-March	NE
10.	Aparajita	*Clitoria ternatea* L.	Fabaceae	3	Native to South & Southeast Asia	Ornamental, culinary	-	Any season	NA
11.	Karabi	*Cascabela thevetia* (L.) Lippold	Apocynaceae	3	Native in Central America	Ornamental	-	Summer	LC
12.	Rangan	*Ixora coccinea* L.	Rubiaceae	5	Native to Indian subcontinent	Ornamental	-	Throughout year, best during rainy seasons.	LC
13.	Karanda	*Carissa carandas*	Apocynaceae	8	Terrestrial	Medicine and food	-	March- April	NA
14.	Mauritius Hemp	*Furcraea foetida*	Asparagaceae	~10	Terrestrial	Ornamental	-	February - June	NA

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
15.	Garden croton	*Codiaeum variegatum*	Euphorbiaceae	~90	Terrestrial	Ornamental	-	Winter	LC
16.	Dutch eggplant	*Solanum aculeatissimum*	Solanaceae	6	Terrestrial	Food	-	Winter	NA
17.	Lilly Pilly	*Syzygium myrtifolium*	Myrtaceae	5	Terrestrial	Ornamental	-	Winter	NA
18.	Elephant apple	*Dillenia indica*	Dilleniaceae	~20	Terrestrial	Ornamental	-	June- July	LC
19.	Merlot Coleus	*Coleus scutellarioides*	Lamiaceae	~20	Terrestrial	Ornamental	-	Spring, Summer	NE
20.	False iron wort	*Hyptis capitata*	Lamiaceae	~50	Terrestrial	Medicinal	-	Early winter	NA
21.	Black nightshade	*Solanum nigrum* L.	Solanaceae	5	Terrestrial	Medicinal	-	December to March	Not evaluated

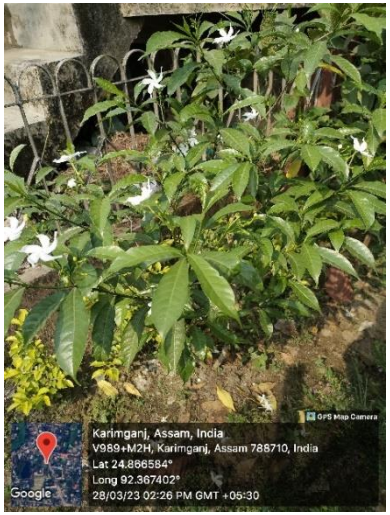
Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
22.	Touch me not	*Mimosa pudica* L.	Fabaceae	~30	Terrestrial	Medicinal	-	November to March	LC
23.	Spider plant	*Cleome houtteana* Schltdl.	Cleomaceae	~10	Terrestrial	Vegetable, medicinal	-	February to March	LC
24.	Devil weed	*Chromolaena odorata* (L.) R.M.King & H.Rob.	Asteraceae	~100	Terrestrial	Ornamental, green manure	Invasive	October-December	Secure
25.	Septic weed	*Senna occidentalis* (L.) Link	Fabaceae	~50	Terrestrial	Medicinal	-	Throughout the year	LC
26.	Spiny amaranth	*Amaranthus spinosus* L.	Amaranthaceae	~30	Terrestrial	Vegetable & Traditional medicine	Invasive	December to April	Secure
27.	Tulsi	*Ocimum tenuiflorum* L.	Lamiaceae	~30	Terrestrial	Traditional medicine	-	September to March	-
28.	Brinjal	*Solanum melongena* L.	Solanaceae	~10	Terrestrial	Vegetable	-	July to September	-

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
29.	Indian turnsole	*Heliotropium indicum* L.	Boraginaceae	~70	Terrestrial	Traditional medicine	-	Throughout the year	LC
30.	Euonymous	*Euonymus japonicus*	Celastraceae	-	Terrestrial, Native to Japan, Korea & China	Ornamental	-	-	-
31.	Natal Fig	*Ficus natalensis subsp. leprieurii*	Moraceae	-	Terrestrial, Native to West tropical Africa	Ornamental	-	Late spring to early summer	LC
32.	Payesh pata	*Pandanus amaryllifolius*	Pandanaceae	-	Terrestrial	Perennial, Ornamental, Culinary	-	-	Rarely flowers

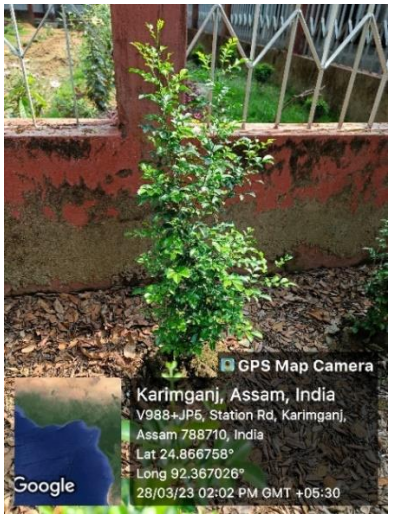
In column 8, '–'indicates the species is neither exotic nor invasive and in other columns, '–' indicates information is not available

1. *Ocimum sanctum* L. (Tulsi)

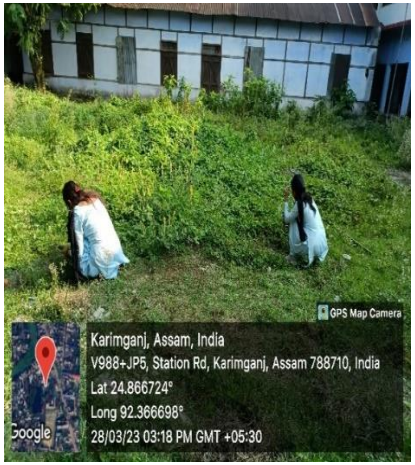
2. *Rosa indica* L. (Indian Rose)



3. *Tabernaemontana divaricate* R.Br. ex Roem. & Schult. (Crepe Jasmine)

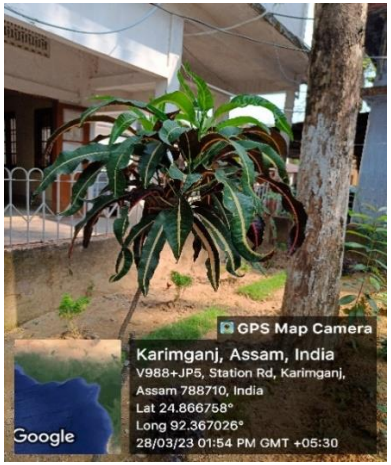


4. *Duranta erecta* L. (Duranta)

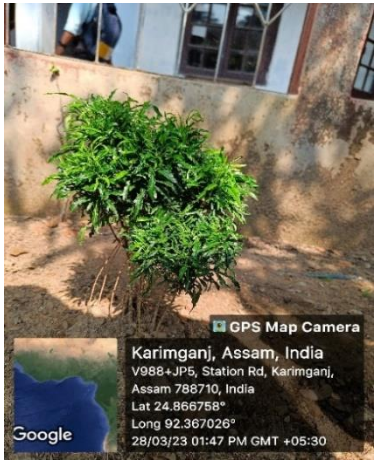


5.*Crotalaria juncea* (Indian hemp)

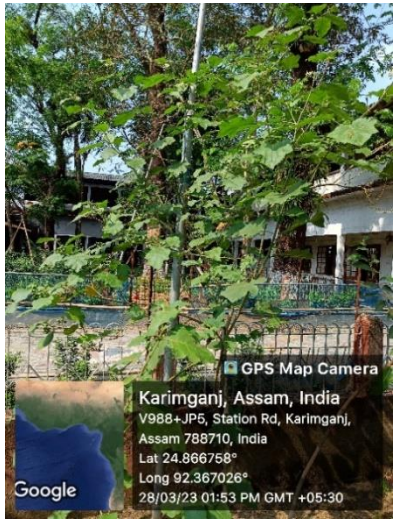
6. *Hibiscus rosa-sinensis* L. (cultivar) (Joba)



7. *Croton sp.* (Patabahar)

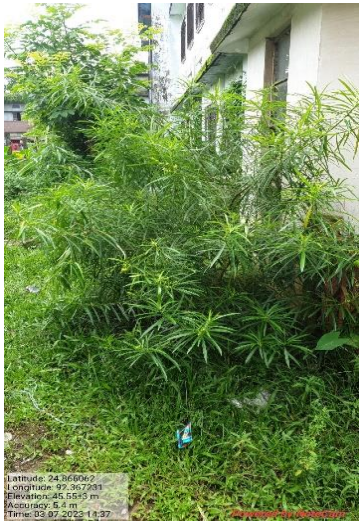


8. *Polyscias fruticose* (L.) Harms (Aralia)



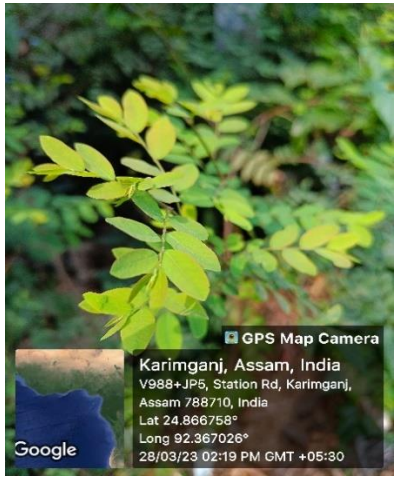
9. *Solanum torvum* Sw. (Tita begun)

10. *Clitoria ternatae* L. (Aparajita)

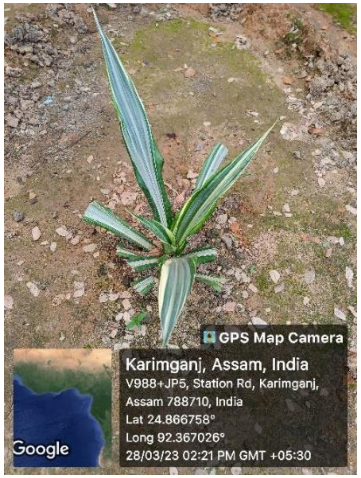


11. *Cascabela thevetia* L. (Karabi)

12.*Ixora coccinea* L. (Rangan)

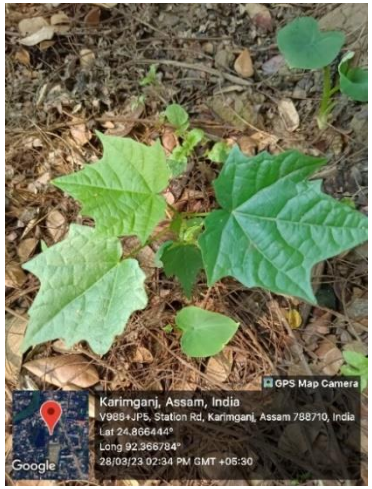


13. *Carissa carandas* (Karanda)



14. *Furcraea foetida* (Mauritius Hemp)

15. *Codiaeum variegatum* (Garden croton)



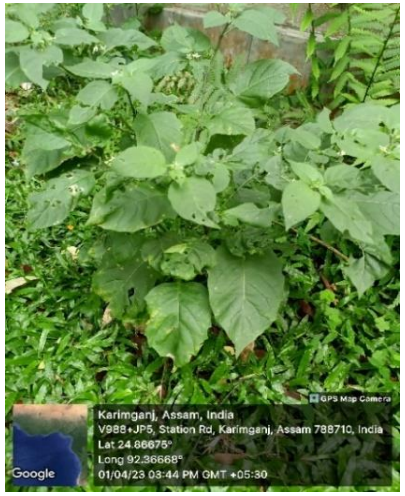
16. *Solanum aculeatissimum* (Dutch Eggplant)

17. *Syzygium myrtifolium* (Lilly Pilly)

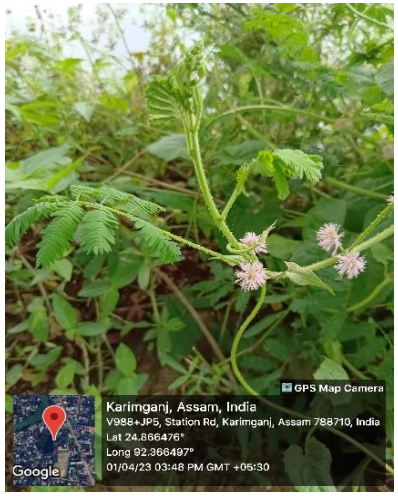
18. *Dillenia indica* (Elephant apple)

19. *Coleus scutellarioides* (Merlot Coleus)

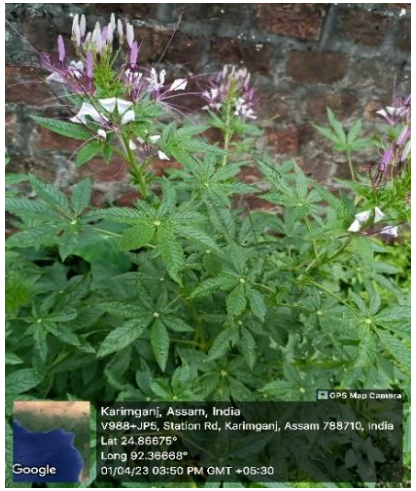
20. *Hyptis capitate* (False ironwort)



21. *Solanum nigrum* (Black nightshade)



22. *Mimosa pudica* (Touch-me-not)



23. *Cleome houtteana* (Spider plant)

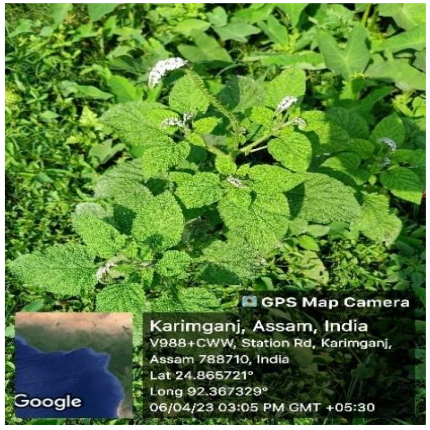
24. *Chromolaena odorata* (Devil weed)

25. *Senna occidentalis* (L.)
LinkSeptic weed

26. *Amaranthus spinosus* L.
(Spiny amaranth)

27. *Ocimum tenuiflorum*
(Tulsi)

28. *Solanum melongena*
(Brinjal)



29. *Heliotropium indicum*
*(*Indian turnsole)

30. *Euonymus japonicus*
(Euonymous)

31. *Ficus natalensis subsp. leprieurii*
(Natal fig)

32. *Pandanus amaryllifolius*

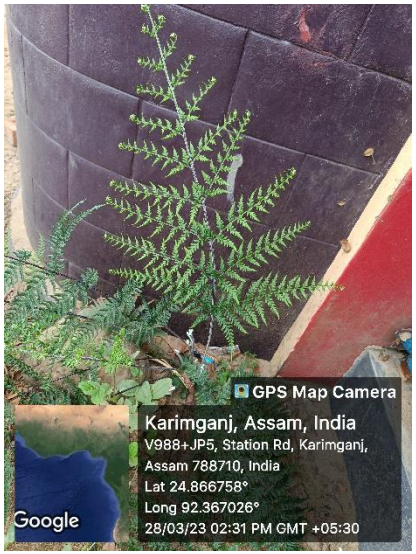
(Payesh pata)

Table: 11 (c) List of fern and fern allies of Karimganj College

Sl.No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
1.	Paloi	*Diplazium esculentum*	Athyriaceae	~200	Terrestrial	Food	-	-	LC
2.	Silver fern	*Cyathea dealbata*	Cyatheaceae	2	Terrestrial	Ornamental	-	-	**NA**
3.	Dragon's Scale	*Drymoglossum piloselloides*	Polypodiaceae	~150	Epiphytic	Medicinal	-	-	**NE**

In column 8, '–' indicates the species is neither exotic nor invasive and in other columns, '–' indicates information is not available

1.*Diplazium escul entum* (Paloi)



2. *Cyathea dealbata* (Silver fern)

3. *Drymoglossum piloselloides* (Dragon's Scale)

Table: 11 (d) List of herb species of Karimganj College

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
1.	Nayantara	*Catharanthus roseus* (L.) G. Don	Apocynaceae	13	Cosmopolitian	Medicinal, garden plants	-	July-September	NA
2.	Lalsa	*Pseuderanthemum carruthersii* (Seem.) Guillaumin	Acanthaceae	~350	Terrestrial	Ornamental	-	Summer	NA
3.	Red Verbena	*Verbena peruviana* (L.) Britton	Verbenaceae	4	Terrestrial, Bolivia, Argentina etc.	Ornamental	-	Winter	NA
4.	Dracaena	*Dracaena* fragrans (L.) Ker gawl.	Asparagaceae	4	Terrestrial, Native throughout tropical Africa	Ornamental	-	Winter	NA
5.	Wondering jew	*Tradescentia zebrina* (Schinz) D. R. Hunt	Commelinaceae	Innumerable	Wetland and rainforest, Native to Mexico, Central America and Columbia	Ornamental, Garden Plant	-	Throughout the year	NA
6.	Chandramallika	*Chrysenthemum* sp.	Asteraceae	150	Tropical, Native to east Asia and northeastern Europe.	Ornamental, culinary, insecticidal, environmental uses	-	Different for different cultivars	NE

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
7.	Waxweed	*Cuphea balsamona*	Lythraaceae	~50	Terrestrial	Ornamental	-	Throughout the year	-
8.	Dianthus (white)	*Dianthus caryophyllus* L.	Caryophyllaceae	5	Terrestrial, Native to Southern Asia and Northern Africa	Ornamental	-	Rainy season	NA
9.	Petunia	*Petunia* sp.	Solanaceae	~10	Terrestrial, Native to South-America	Ornamental, cultural	-	Spring to frost	NE
10.	Kachu	*Colocasia esculenta* (L.) Schott	Araceae	50	Terrestrial, Native to South east Asia	Vegetable & Medicinal Herb	-	August to October	LC
11.	Oysterplant, Boat lily	*Tradescantia spathacea* Sw.	Commelinaceae	5	Tropical and subtropical forests, hilly areas	Ornamental: house plant/ garden plant, a poison, a medicine	-	Throughout the year	-
12.	Banana, kola	*Musa paradisiaca*	Musaceae	10	Southeast Asia, Indian subcontinent	Edible fruit, medicinal, fodder	-	Flower may appear on mature plants on summer	LC
13.	Genda	*Tegetes* sp.	Asteraceae	5	Tropical, subtropical	Ornamental	-	Autumn-Winter	NA

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
14.	Moss rose	*Portulaca grandiflora* Hook.	Portulacaceae	~20	Widespread in South Asia	Ornamental	-	Summer	NE
15.	Kalanchoe	*Kalanchoe blossfeldiana* Poelln.	Crassulaceae	~10	Cultivated	Ornamental,	-	Late autumn to spring	NE
16.	Marigold	*Tagetes patula*	Asteraceae	~10	Terrestrial	Medicinal, Ornamental	-	July-October	NA
17.	Heart's delight/heart of Jesus	*Caladium bicolor* (Aiton) Vent.	Araceae	~30	Tropical areas	Ornamental, poisonous		Summer, fall, spring	NA
18.	Syngonium, arrowhead plant	*Syngonium podophyllum* Schott	Araceae	5	Tropical areas	Ornamental, poisonus Native to Latin America	-	Summer	NA
19.	Kochu	*Colocasia gigantea*	Araceae	~10	Terrestrial	Perennial Food	-	Spring	NA
20.	Bluemink	*Ageratum houstonianum*	Asteraceae	~30	Terrestrial	Annual Ornamental	-	Spring	NA
21.	Alligator weed	*Alternanthera* sp.	Amaranthaceae		Terrestrial & aquatic	Perennial Medicinal Herb	invasive	January to September	-

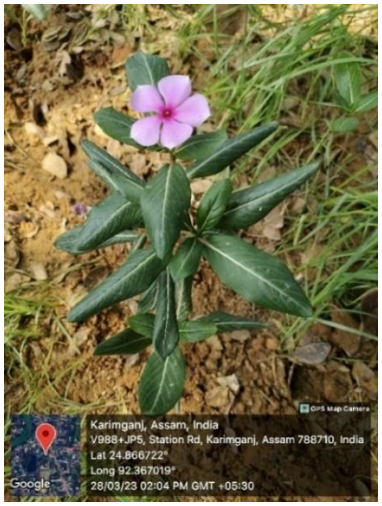
Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
22.	Blumea	*Blumea balsamifera*	Asteraceae	~20	Terrestrial	Perennial Medicinal	-	Throughout the year	NA
23.	Bishalyakarani	*Barleria lupulina*	Acanthaceae	~50	Terrestrial	Perennial Medicinal	-	December to January	NA
24.	Bengal Arum	*Typhonium blumei*	Araceae	~50	Terrestrial	Perennial Medicinal	-	Spring	NA
25.	Ironweed	*Cyanthillium cinereum*	Asteraceae	~50	Terrestrial	Annual Medicinal	-	Throughout the year	NA
26.	Field Sowthistle	*Sonchus arvensis*	Asteraceae	~50	Terrestrial	Perennial Medicinal	-	July - October	NE
27.	Flax Leaved Horseweed	*Erigeron bonariensi*	Asteraceae	~50	Terrestrial	Annual Medicinal	-	August-September	NE
28.	Marsh yellow cress	*Rorippa palustris*	Brassicaceae	~50	Terrestrial	Perennial Food	-	April- July	LC
29.	Black mustard	*Brassica nigra*	Brassicaceae	~5	Terrestrial	Annual Food	-	Summer	LC
30.	Thankuni	*Centella asiatica*	Apiaceae	~100	Terrestrial	Perennial Medicinal	-	April- May	LC

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
31.	Aglaonema	*Aglaonema sp.*	Araceae	~10	Terrestrial	Perennial Ornamental	-	Winter	LC
32.	Touch-me-not	*Mimosa pudica*	Fabaceae	~200	Terrestrial	Annual, Medicinal Nitrogen Fixation	-	November-March	LC
33.	Leucas	*Leucas aspera*	Lamiaceae	~100	Terrestrial	Annual, Medicinal	-	November-February	NA
34.	Scarlet sage	*Salvia splendens*	Lamiaceae	~20	Terrestrial	Perennial, Ornamental	-	March to October	NA
35.	Four o'clock flower	*Mirabilis jalapa*	Nyctaginaceae	~10	Terrestrial	Annual, Medicinal	-	Summer	NA
36.	Portulaca	*Portulaca oleracea*	Portulacaceae	~20	Terrestrial	Annual , Ornamental	-	Winter	NE
37.	Little Ironweed	*Cyanthillium cinereum*	Asteraceae	100	Terrestrial	Annual, Medicinal Herb	-	Summer	-
38.	Benghal dayflower	*Commelina benghalensis* L.	Commelinaceae	100	Terrestrial	Perennial, Medicinal	invasive	June to October	LC
39.	Bhringraj	*Eclipta prostrata* (L.) L.	Asteraceae	10	Terrestrial	Annual, Medicinal Herb	-	Throughout the year	-

Sl.No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN Status
40.	Blumea	*Blumea laciniata* (Roxb.) DC.	Asteraceae	100	Terrestrial	Annual, Medicinal Herb	-	Throughout the year	-
41.	Chick weed	*Ageratum conyzoides* L.	Asteraceae	100	Terrestrial	Annual, Medicinal Herb	invasive	December to May	-
42.	Hedge mustard	*Sisymbrium officinale* (L.) Scop.	Brassicaceae	100	Terrestrial	Perennial, Medicinal Herb	-	June to July	LC
43.	Pathorkuchi	*Bryophyllum pinnatum* (Lam.) Oken	Crassulaceae	100	Terrestrial	Perennial, Medicinal Herb	-	January to February	-
44.	Creeping wood sorrel	*Oxalis corniculata* L.	Oxalidaceae	500	Terrestrial	Perennial, Food & Medicinal Herb	-	March to October	N E
45.	Spider plant	*Chlorophytum comosum*	Asparagaceae	-	Terrestrial	Ornamental	-	Summer	-
46.	Rattlesnake plant	*Geoppertia insignis*	Marantaceae	-	Terrestrial	Ornamental	-	Late spring to early summer	-
47.	Snake plant	*Sansevieria trifasciata*	Asparagaceae	-	Terrestrial	Ornamental	-	Usually in spring	-
48.	Arrowroot plant	*Maranta arundinaceae*	Marantaceae	-	Terrestrial	Ornamental	-	Spring-summer	-

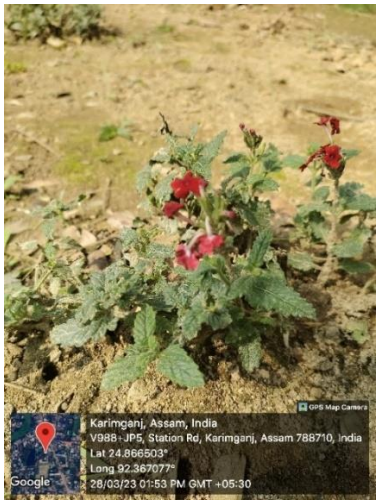
Sl.No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN Status
49.	Monstera	*Monstera sp.*	Araceae	-	Terrestrial	Ornamental	-	Throughout the year	-
50.	Devil's ivy	*Epipremnum aureum*	Araceae	-	Terrestrial	Ornamental	-	Rarely bloom	-
51.	Sweet potato	*Ipomoea batatas*	Convolvulaceae	-	Terrestrial	Food	-	Spring-summer	-
52.	Knotweed	*Persicaria senticosa*	Polygonaceae	-	Terrestrial	Medicinal	-	July-August	-
53.	Stromanthe	*Stromanthe sanguinea*	Marantacear	-	Terrestrial	Ornamental	-	March-April	-
54.	Prayer plant	*Goeppertia ornate*	Marantaceae	-	Terrestrial	Ornamental	-	Late spring to early summer	-

In column 8, '–' indicates the species is neither exotic nor invasive and in other columns, '–' indicates information is not available

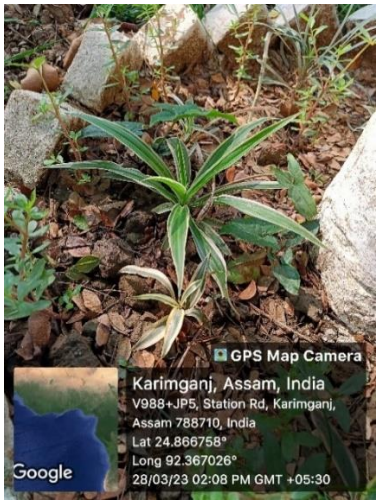


1.*Catharanthus roseus* (L.) G. Don (Nayantara)

2. *Pseuderanthemum carruthersii* (Seem.) Guillaumin (Lalsa)

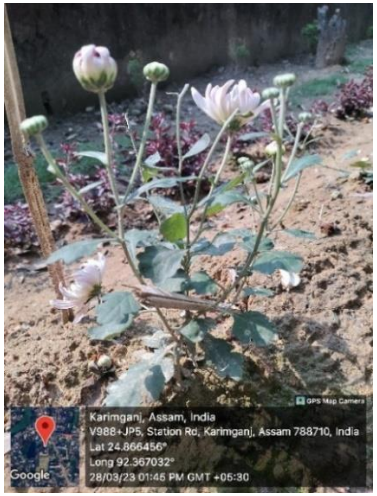


3. *Verbena peruviana* (L.) Britton (Red verbena)



4. *Dracaena sp.* (Dracaena)

5.*Tradescentia zebrina* (Schinz) D. R. Hunt (Wondering jew)

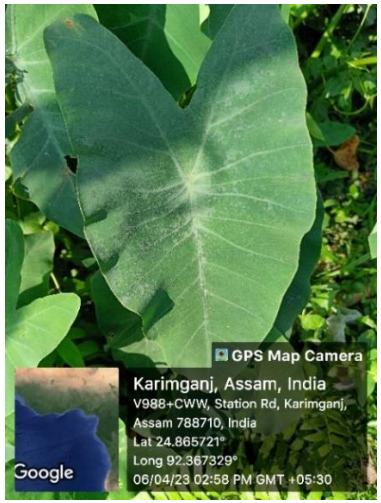


6. *Chrysenthemum* sp (Chandramallika)

7. *Cuphea balsamona* (Waxweed)

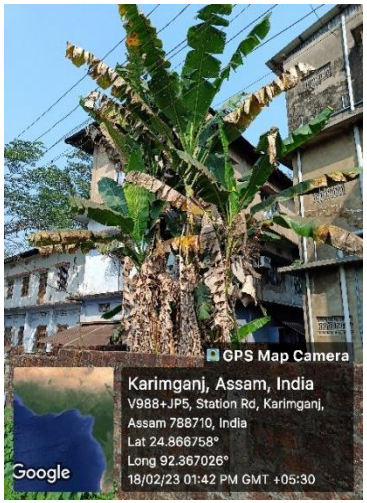
8. *Dianthus caryophyllus* L. (Dianthus)

9. *Petunia* sp. (Petunia)



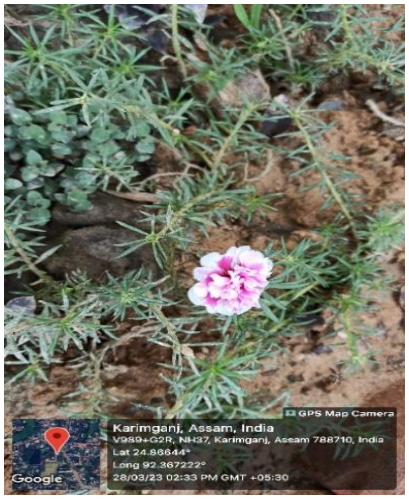
10. *Colocasia esculenta* (Kachu)

11. *Tradescantia spathacea* Sw. (Boat Lily)



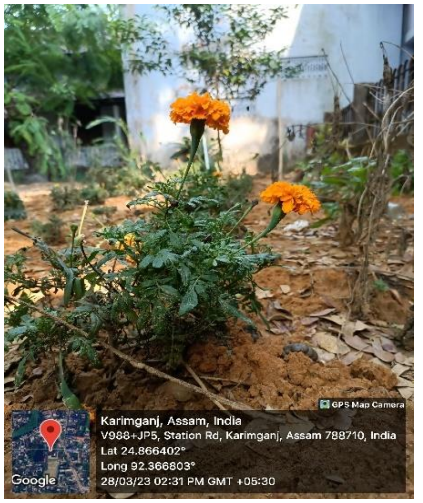
12. *Musa paradisiaca* (Kola)

13.*Tegetes* sp. (Genda)



14. *Portulaca grandiflora* Hook. (Moss rose)

15. *Kalanchoe blossfeldiana* Poelln. (Kalanchoe)

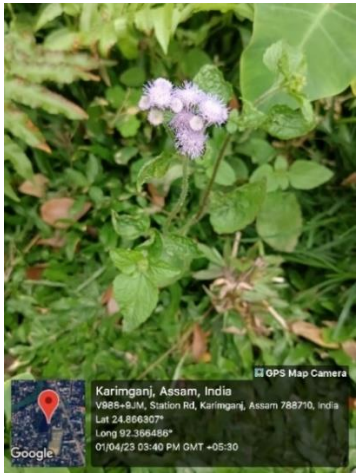


16. *Tagetes patula* (Marigold)

17. *Caladium bicolor* (Aiton) Vent.

18. *Syngonium podophyllum Schott*

19. *Colocasia gigantean* (Kochu)



20. *Ageratum houstonianum* (Bluemink)

21. *Alternanthera* sp.

(Alligator weed)

22. *Blumea balsamifera*

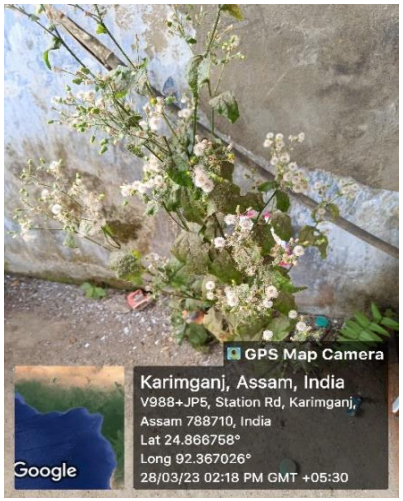
(Blumea)

23. *Barleria lupulina*

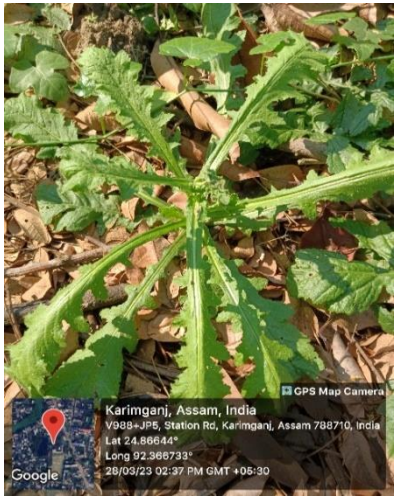
(Bishalyakarani)

24. *Typhonium blumei*

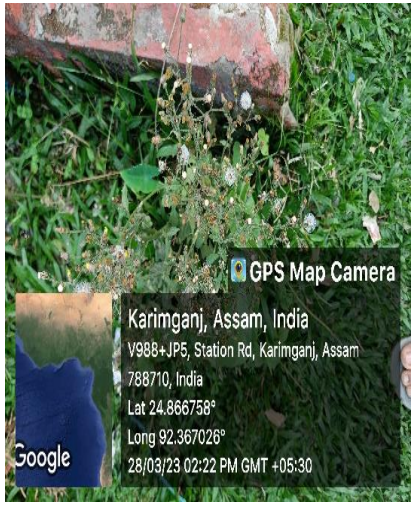
(Bengal Arum)



25. *Cyanthillium Cinereum*
(Ironweed)

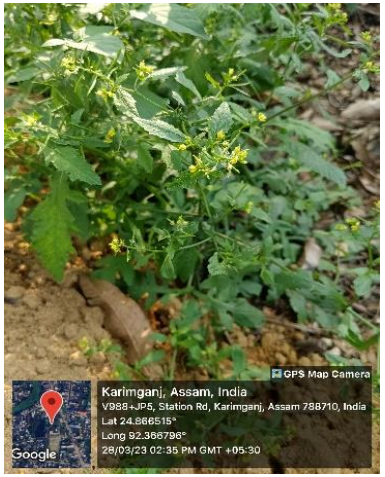


26. *Sonchus arvensis*
(Field Sowthistle)

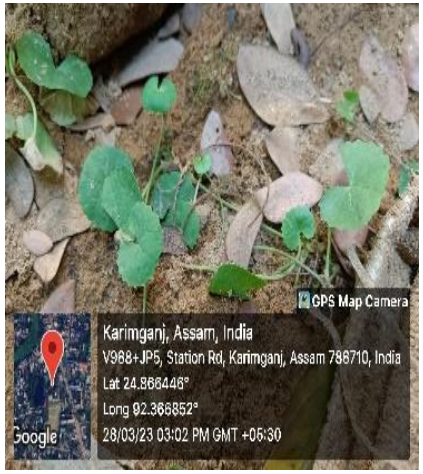


27. *Erigeron bonariensi*
(Flax LeavedHorseweed)

28. *Rorippa palustris*
(Marsh yellow cress)

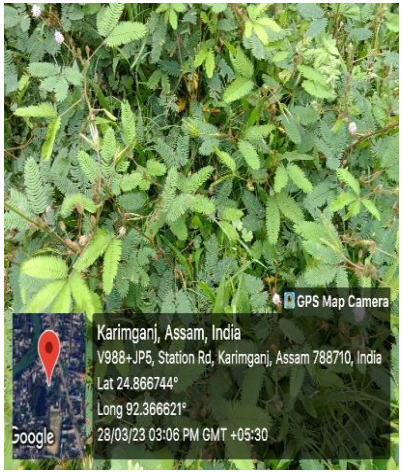


29. *Brassica nigra* (Black mustard)



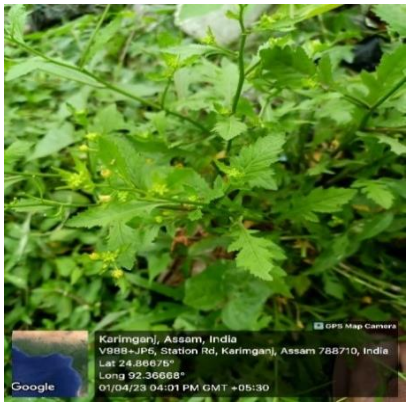
30. *Centella asiatica* (Thankuni)

31. *Aglaonema sp.* (Aglaonema)



32. *Mimosa pudica* (Touch-me-not)

41. *Ageratum conyzoides*
(Chick weed)



42. *Sisymbrium offinale*
(Hedge Mustard)

43.*Bryophyllum pinnatum*
(Pathorkuchi)

44. *Oxalis corniculata*
(Creeping woodsorrel)

45. *Chlorophytum comosum*
(Spider plant)

46. *Geoppertia insignis*
(Rattlesnake plant)

47. *Sansevieria trifasciata*
(Snake plant)

48. *Maranta arundinaceae*
(Arrowroot plant)

49. *Monstera* sp.
(Monstera)

50. *Epipremnum aureum*
(Devil's ivy)

51. *Ipomoea batatas*
(Sweet potato)

52. *Persicaria senticosa*
(Knotweed)

53. *Stromanthe sanguinea*
(Stromanthe)

54. *Goeppertia ornate*
(Prayer plant)

Table: 11 (e) List of grass species of Karimganj College

Sl.No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
1.	Indian Lemon grass	*Cymbopogon schoenanthus* (L.) Spreng.	Poaceae	1	Tropical, subtropical, Native to Southern Asia and Northern Africa	Herbal tea, herbal oil, tonic, cosmetics & moisturizer	-	Summer	NA
2.	Bermuda grass	*Cyanodon dactylon* (L.) Pers.	Poaceae	~200	Cosmopolitan	Religious, medicinal, ornamental	-	Late summer	NE

In column 8, '–' indicates the species is neither exotic nor invasive

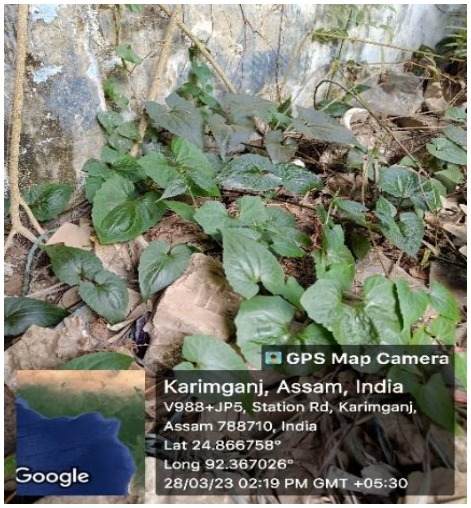
1. *Cyanodon dactylon* (L.) Pers.
(Durba)

2. *Cymbopogon schoenanthus* (L.) Spreng.
(Lemon Grass)

Table: 11 (f) List of climber species of Karimganj College

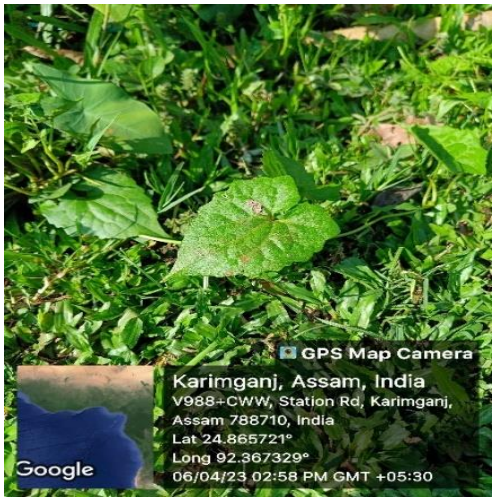
Sl.No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Perennial/annual /seasonal	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN Status
1.	Refugee lota	*Mikania micrantha*	Asteraceae	~100	Terrestrial	Perennial	Medicinal	Invasive	September to October	NA
2.	Velvetleaf	*Cissampelos pareira* L.	Menispermaceae	100	Terrestrial	perennial	Medicinal	-	August to October	NE
3.	Climbing hempweed	*Mikania scandens* B.L.Rob.	Asteraceae	200	Terrestrial	perennial	Traditional Medicine	Invasive	August to September	Secure
4.	Kumra	*Cucurbita pepo* L.	Cucurbitaceae	20	Terrestrial	Annual	Vegetable & Medicine	-	July to September	LC
5.	Misti Kumra	*Cucurbita maxima* Duch.	Cucurbitaceae	20	Terrestrial	Annual	Vegetable & Medicine	-	July to September	LC

In column 9, '–' indicates the species is neither exotic nor invasive



1. *Mikania micrantha* (Refugee lota)

2. *Cissampelos pareira* (Velvet leaf)



3. *Mikania scandens* (Climbing hempweed)

4. *Cucurbita pepo* (Kumra)

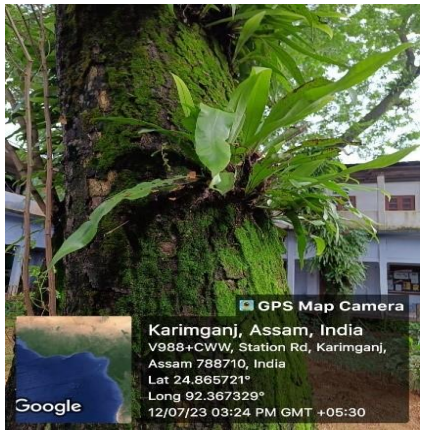
5. *Cucurbita maxima* (Misti Kumra)

Table: 11 (g) List of epiphytes and parasitic plant species of Karimganj College

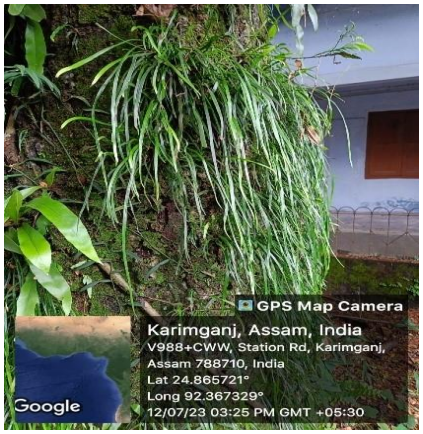
Sl. No	Common Name	Scientific name	Family	Nos.	Landscape / Habitat	Perennial/annual/seasonal	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN Status
1.	Dendrobium	*Dendrobium* sp.	Orchidaceae	1	Epiphytic	Perennial	ornamental	-	April-May	-
2.	Fishtail fern	*Microsorum punctatum*	Polypodiaceae	-	Parasitic	Perennial	Parasitic	-	-	-
3.	Shoestring fern	*Vittaria* sp.	Pteridaceae	-	Parasitic	Perennial	Parasitic	-	-	-
4.	Bird's nest fern	*Asplenium nidus*	Aspleniaceae	-	Parasitic	Perennial	Parasitic	-	-	-
5.	Oakleaf fern	*Drynaria quercifolia*	Polypodiaceae	-	Parasitic	Perennial	Parasitic	-	-	-
6.	Bhatou ful	*Papilionathe teres*	Orchidaceae	5	Epiphytic	Perennial	Ornamental	-	April-May	-
7.	Ronga Kopou ful	*Aeredes multiflora*	Orchidaceae	5	Epiphytic	Perennial	Ornamental	-	April-May	-
8.	Bulbophylum	*Bulbophylum* sp.	Orchidaceae	1	Epiphytic	Perennial	Ornamental	-	April-May	-

In column 8, '–' indicates the species is neither exotic nor invasive and in other columns, '–' indicates information is not available

1. *Dendrobium* sp.
(Dendrobium)



2. *Microsorum punctatum*
(Fishtail fern)



3. *Vittaria* sp.
(Shoestring fern)

4. *Drynaria quercifolia*
(oakleaf fern)

5. *Asplenium nidus*
(Bird's nest fern)

6. *Papilionathe teres*
(Bhatou ful)

7. *Aeredes odorata*
(Ronga Kopou ful)

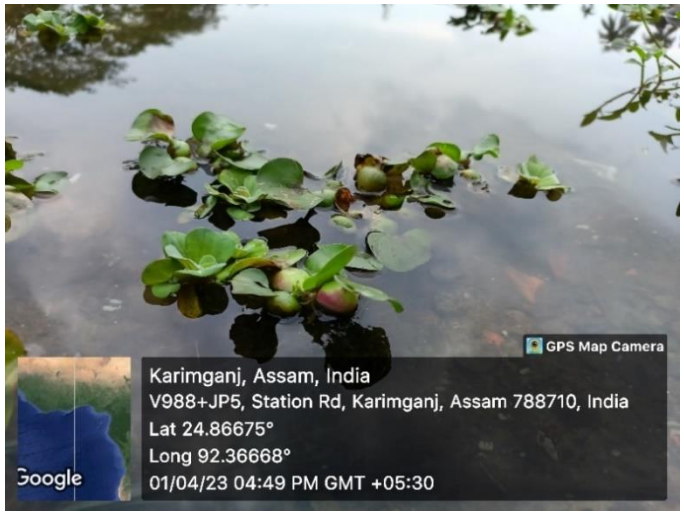
8. *Bulbophylum* sp
. (Bulbophylum)

Table: 11 (h) List of aquatic plant species of Karimganj College

Sl. No	Common Name	Scientific name	Family	Number	Landscape / Habitat	Importance (as economic, social, cultural etc.)/Use/Associated TK	Other details like exotic, invasive (in India)	Flowering season	IUCN status
1.	Kochuripana	*Pontederia crassipes* Mart.	Pontederiaceae	~100	Aquatic	Bioenergy, phytoremediation, agriculture etc	Invasive	Spring- early Summer	NA
2.	Kolmi shak	*Ipomoea aquatica* Forssk.	Convolvulaceae	~100	Aquatic	Food, phytoremediation, animal feed, medicinal	-	Summer-rainy season	LC
3.	Alligator weed	*Alternanthera philoxeroides*	Amaranthaceae	100	Aquatic	Food, medicinal	-	Summer-rainy season	-

In column 8, '–' indicates the species is neither exotic nor invasive

In column 10, '–' indicates information is not available



1. ***Pontederia crassipes*** **(Water hyacinth/** Kochuripana ***)***

2. ***Ipomoea aquatica*** **(Kolmi shak)**

3. ***Alternanthera philoxeroides*** **(Alligator weed)**

Faunal Species of Karimganj College, Assam

Table: 12 List of animal species of Karimganj College campus

Sl. No	Common Name	Scientific name	Family	Landscape / Habitat	Importance (economic, social, cultural etc.)/use/associated TK	Other details like exotic/ Indigenous	IUCN Status
1.	Rhesus monkey	*Macaca mulatta*	Cercopithecidae	Both arboreal and terrestrial	Great value in medical and scientific research	Indigenous	LC
2.	Goat	*Capra aegagrus hircus*	Bovidae	Terrestrial	An important source of protein (both milk and meat)	Indigenous	No special status
3.	Cow	*Bos sp.*	Bovidae	Terrestrial	Provides milk.	Indigenous	-
4.	Dog	*Canis lupus familiaris*	Canidae	Terrestrial	Keep ecosystem clean by removing dead or diseased animals from environment.	Indigenous	LC
5.	Cat	*Felis Catus*	Felidae	Terrestrial	They are predator, drive away rodents	Indigenous	LC
6.	Squirrel	*Sciurus* sp.	Sciuridae	Arboreal	Helps in seed dispersal and forest regeration, food source for other animals	Indigenous	LC
7.	Checkered keelback	*Fowlea piscator*	Colubridae	Both aquatic and terrestrial	They eat insects and are found in the middle of many food chains.	Indigenous	LC
8.	Calotes	*Calotes versicolor*	Agamidae	Arboreal	Control insect population & acts as a prey of snakes and birds	Indigenous	LC
9.	Common wall lizard	Hemidactylus frenatus	Gekkonidae	Terrestrial	Good pest controllers	Indigenous	LC

Sl. No.	Common Name	Scientific name	Family	Landscape / Habitat	Importance (economic, social, cultural etc.)/use/associated TK	Other details like exotic/ Indigenous	IUCN Status
10.	Endogeic earthworm	*Pheretima posthuma*.	Megascolecidae	Terrestrial	Increase soil fertility and improves soil structure	Indigenous	-
11.	Epigeic earthworms	*Eisenia* sp.	Lumbricidae	Terrestrial	Improves soil quality	Indigenous	NE
12.	Leech	*Hirudinaria* sp.	Hirudinidae	Terrestrial	Serve as food for some higher predators in the food chain	Indigenous	-
13.	Black garden ant	*Lasius niger*	Formicidae	Terrestrial	They eat and clean the environment.	Indigenous	NE
14.	Red ant	*Solenopsis* sp.	Formicidae	Terrestrial	Decrease some pest insect numbers	Indigenous	
15.	The Commander	*Moduza Procris*	Nymphalidae	Aerial	Helps in pollination	Indigenous	NE
16.	Pale Grass Bluebutterfly	*Pseudozizeeria maha*	Lycaenids	Aerial	Useful as indicator for radioactive pollution	Fairly Common	-
17.	Lemon pansy	*Junonia lemonias*	Nymphalidae	Aerial	Good Pollinators	Indigenous	NE
18.	Plain Tiger	*Danaus chrysippus*	Nymphalidae	Aerial	Valuable Pollinators	Uncommon	
19.	Common Mormon	*Papilio polytes*	Papilionidae	Aerial	Helps in pollination	Common	LC
20.	Scalloped grass yellow	*Eurema alitha*	Pieridae	Aerial	Helps in pollination	Common	-
21.	Grey pansy	*Junonia atlites*	Nymphalidae	Aerial	Helps in pollination	Common	LC
22.	Cabbage White Butterfly	*Pieris rapae*	Pieridae	Aerial	Helps in pollination	Common	LC
23.	TheCommon Crow	*Euploea core*	Nymphalidae	Aerial	Helps in pollination	Common	LC

Sl. No.	Common name	Scientific name	Family	Landscape / Habitat	Importance (economic, social, cultural etc.)/use/associated TK	Other details like exotic/ Indigenous	IUCN Status
24.	Peacock pansy	*Junonia almana*	Nymphalidae	Aerial	Helps in pollination	Common	LC
25.	Baron	*Euthalia aconthea*	Nymphalidae	Aerial	Helps in pollination	Common	NE
26.	Yellow waxtail	*Ceriagrion coromandelianum*	Coenagrionidae	Aerial	Helps in pollination	Very Common	Threatened Species
27.	Variegated flutterer	*Rhyothermis variegata*	Libellulidae	Aerial	Helps in pollination	Common	LC
28.	*Dragon fly*	*Neurothemis* sp.	Libellulidae	Predators (particularly of mosquitos prey to birds and fish	Important environmental, helps in pollination indicator.	Common	Threatened Species.
29.	Black-hooded oriole	*Oriolus xanthornus*	Oriolidae	Aerial	Can be used to provide early warning of environmental problems.	-	LC
30.	Spotted dove	*Spilopelia chinensis*	Columbidae	Aerial	Helps in seed dispersal	-	LC
31.	Tailor bird	*Orthotomus sutorius*	Cisticolidae	Aerial	Control insect population	-	LC
32.	Crow	*Corvus* sp.	Corvidae	Aerial	Being scavenger clean up garbage	-	LC
33.	Red vented bulbul	*Pycnonotus cafer*	Pycnonotidae	Aerial	Pollinators and helps in seed dispersal	-	LC
34.	White owl	*Bubo* sp.	Strigidae	Aerial	Control insect population, play a very important role in controlling the rodent population.	-	LC

Sl. No.	Common name	Scientific name	Family	Landscape / Habitat	Importance (economic, social, cultural etc.)/use/associated TK	Other details like exotic/ Indigenous	IUCN Status
35.	Black drongo	*Dicrurus macrocercus*	Dicruridae	Aerial	Control insect population	Indigenous	LC
36.	Sparrow	*Passer domesticus indicus*	Passeridae	Aerial	Control insect population	Indigenous	LC
37.	Domestic duck	*Anas* sp.	Anatidae	Aquatic	Natural predators against insects, slugs and snails , important source of meat and egg	Indigenous	LC
38.	Indian cormorant	*Phalacrocorax sp.*	Phalacrocoracidae	Aquatic	Facilitates the dislocation of organic matter between aquatic and terrestrial ecosystems	Indigenous	LC
39.	Kingfisher	*Alcedo atthis*	Alcedinidae	Aerial	good indicators of freshwater community health	Indigenous	LC
40.	Oriental magpie-robin	*Copsychus saularis*	Muscicapidae	Aerial	Control insect population	Indigenous	LC
41.	Blue-throated barbet	*Psilopogon asiaticus*	Megalaimidae	Aerial	Play vital role in seed dispersal	Indigenous	LC
42.	Parrot	*Psittacara holochlorus*	Psittacidae	Aerial	Seed dispersers	Indigenous	LC
43.	Cuckoo	*Cuculus canorus*	Cuculidae	Aerial	messenger of spring	Indigenous	LC
44.	Common moyna	*Acridotheres tristis*	Sturnidae	Aerial	Helpful in controlling insects, helps in seed dispersal	Indigenous	Invasive species
45.	Woodpecker	*Dryocopus pileatus*	*Picidae*	Aerial	Keystone species	Indigenous	LC

Sl. No.	Common name	Scientific name	Family	Landscape / Habitat	Importance (economic, social, cultural etc.)/use/associated TK	Other details like exotic/ Indigenous	IUCN Status
46.	Indian Flapshell Turtle	*Lissemys punctata*	Trionychidae	Aquatic	Effective and voracious predators maintaining the balance of various prey species, they are also cleaners.	Indigenous	LC
47.	Swamp eel	*Monopterus* sp.	Synbranchidae	Aquatic	Medicinally valuable, nutritionally rich food	-	LC
48.	Tilapia	*Oreochromis niloticus*	Cichlidae	Aquatic	They are rich in phosphorus, vitamin B12. Low in fat	Exotic	LC
49.	Rohu	*Labeo rohita*	Cyprinidae	Aquatic	Important food fish	Indigenous	LC
50.	Catla	*Catla catla*	Cyprinidae	Aquatic	Important food fish	Indigenous	NE
51.	Mrigel	*Cirrhinus mrigala*	Cyprinidae	Aquatic	Important food fish		LC
52.	Grass carp	. *Ctenopharyngodon idella*		Aquatic	Important food fish	Exotic	LC
53.	Puti	*Puntius* sp.	Cyprinidae	Aquatic	Important food fish	Indigenous	LC

'–' indicates information is not available

1. *Macaca mulatta* (Rhesus monkey)

2. *Capra aegagrus hircus* (Goat)

3. Bos sp. (Cow)

4. *Canis lupus familiaris* (Dog)

5. *Felis Catus* (Cat)

6. *Sciurus* sp. (Squirrel)

8. ***Calotes versicolor*** **(Calotes)**

15. ***Moduza Procris*** **(The Commander)**

16. ***Pseudozizeeria maha*** **(Pale Grass Blue Butterfly)**

17. ***Junonia lemonias*** **(Lemon pansy)**

18. ***Danaus chrysippus*** **(Plain Tiger)**

19. ***Papilio polytes*** **(Common Mormon)**

*Sl. nos. of photographs are according to their nos. in the table

20. *Eurema alitha* (Scalloped grass yellow)

21. *Junonia atlites* (Gray pansy)

22. *Pieris rapae* (Cabbage White Butterfly)

23. *Euploea core* (The Common Crow)

24. *Junonia almana* (Peacock pansy)

25. *Euthalia aconthea* (Baron)

*Sl. nos. of photographs are according to their nos. in the table

26. ***Ceriagrion coromandelianum***

(Yellow waxtail/Damsel fly)

27. ***Rhyothermis variegate***

(Variegated flutterer/Dragon fly)

28. ***Neurothermis*** **sp.**

(Fulvous forest skimmer/Dragon fly)

29. ***Oriolus*** **sp.(Black-hooded oriole)**

30. ***Spilopelia*** **sp.** **(Spotted dove)**

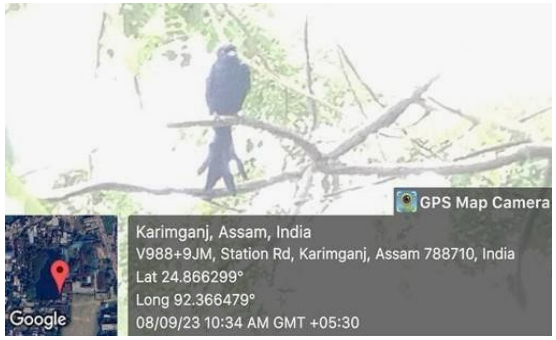
31. ***Orthotomus*** **sp. (Tailor bird)**

*Sl. nos. of photographs are according to their nos. in the table

32. *Corvus* sp. (Crow)

33. *Pycnonotus* sp.*(*Red -vented bulbul)

34. *Bubo* sp. (White owl)



35. *Dicrurus* sp. (Black drongo)

36. *Passer domesticus indicus* (Sparrow)

35. *Anas sp.* (Domestic duck)

*Sl. nos. of photographs are according to their nos. in the table

40. *Copsychus* sp.(Oriental magpie -robin)

41. *Psilopogon asiaticus* (Blue-throated barbet)

45. *Lissemys punctata* (Indian Flapshell Turtle)

46. *Monopterus* sp. (Swamp eel)

47. *Oreochromis niloticus* (Tilapia) 48. *Labeo Rohita* (Rohu) 49. *Catla catla* (Catla) 50. *Cirrhinus mrigala* (Mrigel)

51. *Ctenopharyngodon idella* (Grass carp) 52. *Puntius* sp. (Puti)

*Sl. nos. of photographs are according to their nos. in the table

Chapter 4

4.1. Good Practices

To make environment green and sustainable and to inculcate environment consciousness amongst the stakeholders and community people, the college follows and implements following eco-friendly practices:

- Vermicomposting is practiced in the College campus.
- Ban on single use plastics inside the campus.
- Ban on Tobacco usage inside the campus.
- Regular plantation and cleanliness drive inside the College Campus, in the adopted village and in the neighbouring community.
- A seasonal kitchen garden is maintained in the college campus. Also, a small herbal garden consisting of plants with medicinal values (viz., such as Tulshi, Giloy, Basil, Ajwain etc.) is developed inside the college campus.
- Chemical fertilizers and chemical pesticides are not used.
- An aquatic ecosystem (pond) is maintained with many fish species which generates substantial amount of revenue for the college every year.
- Artificial nests, bird's feeder etc. are installed to attract birds as a part of biodiversity conservation.
- Proper waste management techniques are practiced inside the college campus.
- Environmental awareness campaigns are regularly carried out in the campus and in community to educate the students and the citizens.

Green initiatives in the adopted village

Karimganj college has adopted a village named Kornamadhu which is about 5 Km distance from the college. College has taken a sincere effort to make a difference in the lives of

denizens through various green and sustainable practices viz, planting fruit tree saplings, arranging various awareness programmes, providing skill development trainings as for example **sewing training** so that village women can develop their sewing skills and achieve economic independence.

4.2 Green Practices with Photo Evidence

The Green Practices is an initiative of the college to protect the environment. The campus protects age old trees. In addition to this, several new trees are also planted. The Eco club, Environment and Climate Cell, Beautification and Plantation Committee, NSS Unit, Ecology & Environmental Science and Botany & Biotechnology Department of the college are very active to create awareness regarding environment protection and conservation and also in the maintenance of ecofriendly college campus. Followings are some photographs of green practices:

5th June, 2020, World Environment Day (celebration amid COVID-19 pandemic)

Activity: Students planted saplings in their home garden.

19th February, 2021

Activities

- **Prof. L.K. Bhattacharya** Memorial Lecture on ***Global Warming-it's Impact on Biodiversity.***

Speaker: Shri Shyamal Prasad Choudhury, Environmental Activist, Incharge CD Plant. AE. Environment Cell (Retd.) HPC, Panchgram, Hailakandi , Assam.

- **Prof. P. Bhattacharya** Memorial Lecture on ***Recent Advances in Agricultural Science.***

Speaker: Dr. Ashim Chakravorty, Associate professor, Department of Botany, Sripat Singh College, Jiaganj , Murshidabad, West Bengal.

5th June, 2021World Environment Day (Virtual mode)
Activities: Students planted saplings in their home garden.

- Webinar on the theme **'Ecosystem Restoration'.**

Iconic Week "4th -10th Oct, 2021": Celebration of **Iconic Week "4th - 10th Oct, 2021"** under **Azadi ka Amrit Mahotsav.**

Activity: Plantation Drive

April 22, 2022, World Earth Day

Activities: Cleanliness drive

- Plantation programme
- Awareness campaign.

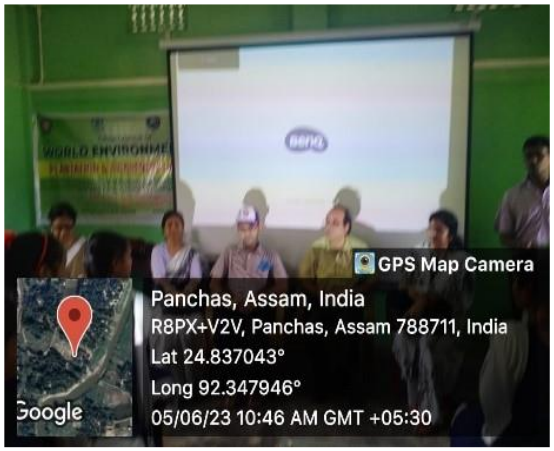
5th June, 2022, World Environment Day

Activities: Students performed **street drama** titled **'Clean India, Green India'** in different market areas of Karimganj town and in the adopted village of the college

- Distribution and plantation of fruit tree saplings, leaflets distribution by NSS volunteer.

15th July-15thAugust, 2022

Activity: Chief Minister's Institutional Plantation Programme **(CMIPP)** on the Occasion of Completion of Yearlong Celebration of **Azadi ka Amrit Mahotsav.**



5th June, 2023, , World Environment Day

Activities: Invited talk on the '**Plastic pollution**' in the adopted village of the college

- Awareness campaign on '***say no to single use plastic'*** and **ban on single use plasic items** inside Karimganj College campus
- Sapling plantation.

Swachha Bharat Abhiyan

30th September to 2 nd October

Activities: 3- day Cleanliness drive

- Inside college campus
- In different areas of Karimganj town

'Amrit Brikshya Abhiyan' on 17.09.23

Activity: Tree plantation drive inside college campus and in Municipality Housing Complex

Chapter 5

5.1 Conclusion

Karimganj College always strives for all-round development of the students. College has taken enormous efforts to maintain green campus in a sustainable manner and also conducting a large number of in campus and off campus activities for the benefit of all associated with it and its neighbouring community. The external audit team opines that the overall campus is maintained well from an environmental perspective and suggested few things that are important to initiate urgently viz., installation of rainwater harvesting unit and solar panel.

5.2. Recommendations

1. Name plates of plants with QR code should be displayed near the plants.
2. Plant Ownership Program should be initiated. Trees should be owned by staff as well as students. The names of staffs / students should also be displayed near the plants.
3. Green building guidelines should be followed for future construction activities of the College.
4. Rain water harvesting unit should be installed with more recharge pit in suitable areas inside the campus.
5. Water meter should be installed for monitoring the water consumption in each block/ department.
6. Waste water treatment plant should be installed.

References

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- Energy Conservation Act 2010
- The Water [Prevention & Control of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Air [Prevention & Control of Pollution] Act – 1981 (Amended 1987)
- E-waste management rules, 2016

- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- Welford, R. (2002) Corporate Environmental Management, Earthscan Publication Ltd. London.

ANNEXURE I

Awareness against food wastage

Vermicompost Tank

ICT based teaching learning process

Induction programme

Book donation programme

Reuse of furniture wood as barricade frames for garden

Reuse of construction and demolition waste

Sanitary Napkin vending machine

Sanitary Napkin incinerator

Dustbins for waste segregation

E-waste Collection Centre

Chemical Waste Disposal Tank(Liquid)

Chemical Waste Disposal Tank (Solid)

Bio-Waste Disposal Tank

ANNEXURE II

Students are busy in maintaining college garden

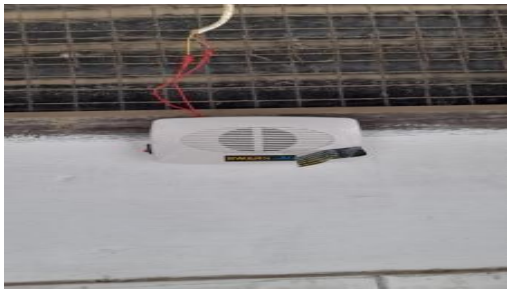
A Blue throated barbet looking out of its nest

Nest of Tailor bird

Welcoming Prof. Gurudas Das, NIT Silchar with plant saplings

Stickers displayed throughout the college campus to create awareness on energy saving

ANNEXURE III



Sensor installed in overhead tank to prevent overflow of water

College pond

Instructions to turn off the water taps after use

Sprinkler use

Cleaning of reservoir and overhead tanks

Ground Water Recharge Pit

ANNEXURE IV

Silence Zone (library) inside the Campus

No honking signage

DG Set for Power Back up