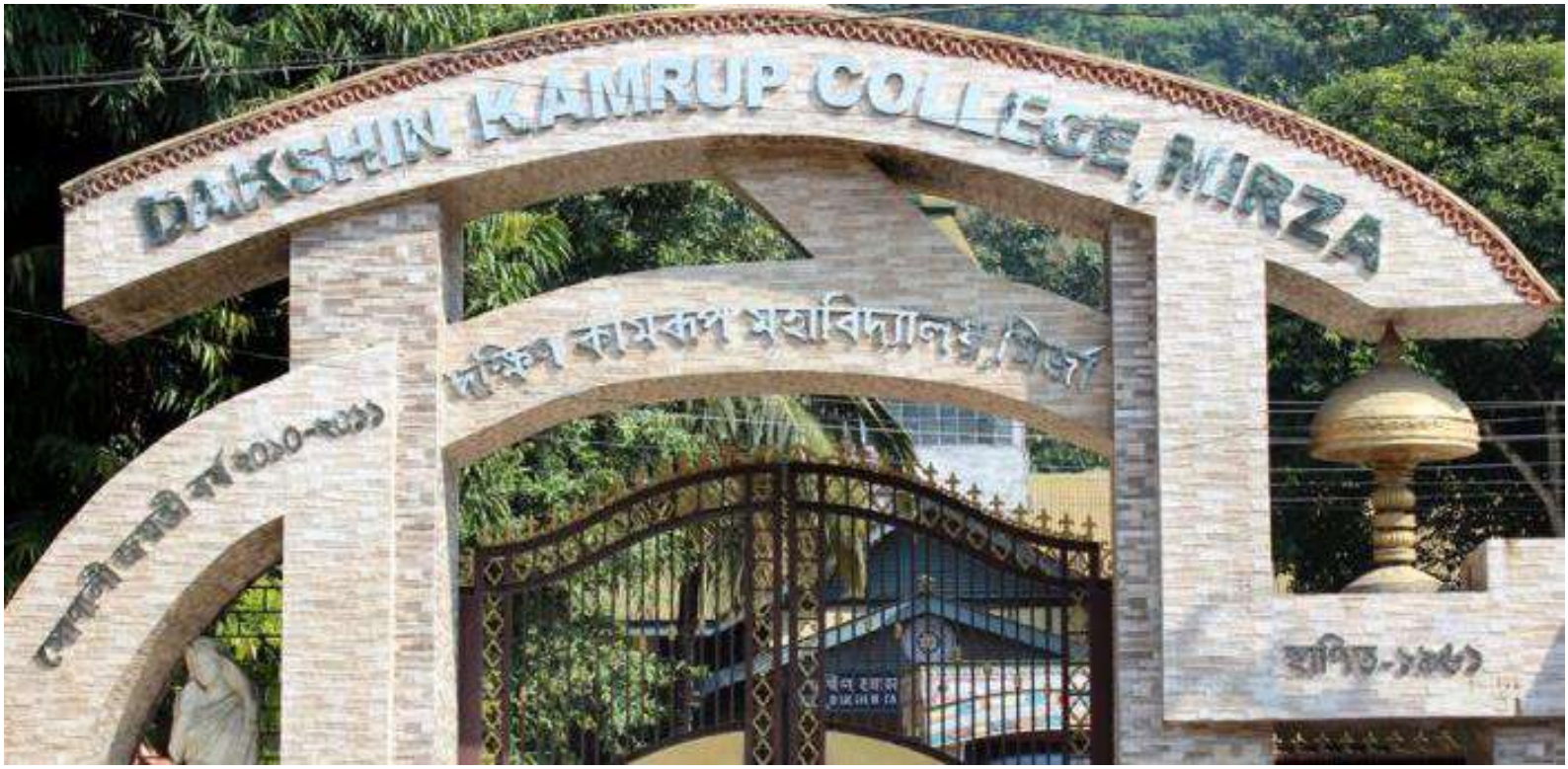
GREEN AUDIT

DAKSHIN KAMRUP COLLEGE
2021-2022



Centre for the Environment
Indian Institute of Technology Guwahati
Guwahati-781039, Assam, India

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Under the consultation of

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EXECUTIVE SUMMARY

Green audit is defined as an official examination of the effects a college has on the environment. As a part of such practice, internal environmental audit (Green Audit) is conducted to evaluate the actual scenario at the campus. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. Green auditing and the implementation of mitigation measures is a win-win situation for all the college, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus.

Green auditing promotes financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

In Dakshin Kamrup College, the audit process involved initial interviews with management to clarify policies, activities, records and the cooperation of staff and students in the implementation of mitigation measures. This was followed by staff and student interviews, collection of data through the questionnaire, review of records, observation of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the green auditing process in the college. The baseline data prepared for the Dakshin Kamrup College, will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development of the college. Existing data will allow the college to compare its programmes and operations with those of peer institutions, identify areas in need of

improvement, and prioritize the implementation of future projects. We expect that the management will be committed to implement the green audit recommendations.

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CHAPTER 1

INTRODUCTION

Dakshin Kamrup College is a pioneering institution of higher learning in the entire South Kamrup area and in fact it emerged as one of the apex higher educational institutions in the state of Assam. The college is so named because it is the fruit of the untiring and relentless efforts of the people of Dakshin Kamrup area. Dakshin Kamrup, as the name indicates, is a vast area of Kamrup District stretching over hundred and fifty miles along the southern bank of the mighty Brahmaputra. This rural area has a rich cultural heritage, but its literacy percentage is rather low. Palasbari, famous for timber and Muga industry, is its prime trade centre. But this place has lost its old glory due to devastating erosion caused by the Brahmaputra. Educationists, social workers, student, and a cross-section of the public had long felt the need for a centre of higher education in this vast area and their dream was fulfilled when this college came into existence on November 14, 1961. During early days this was the only institution for higher education in this vast rural area. Passing through glorious 50 years, the college has fulfilled the long cherished hope and aspirations of the people of Dakshin Kamrup.

Today this college, humble though its beginning was, has grown into a full-fledged one. It provides the students with all facilities for pursuit of knowledge. It is now flourishing not only as an academic institution, but also as a centre for sports and culture. It has grown into a full-fledged higher educational institution. It provides the students with all possible modern teaching aids and facilities for the pursuit of knowledge. The college is located at Mirza, which was an ideal village at the time of its establishment and today it is a fast growing and expanding township with many private sector higher educational institutions. Mirza is about 35 km to the west of Guwahati City in the District of Kamrup. The National Highway No. 37 runs through it. The catchments area surrounding Mirza comprises a vast area touching the river Brahmaputra on the North. The Meghalaya border is about 25 km in south and the district of Goalpara is about 120 km west of it.

The enthusiasm and pace towards progress were in no way hindered due to the humble beginning of the institution. In 1967, the college was affiliated to Gauhati University and in

1972 it was brought under deficit grants-in-aid system of the Assam government. The science section was introduced in 1979 and brought under the same funding scheme in 1987.

Beginning modestly, the college has now provincialized under the Govt. of Assam on 01-01-2006 and grown to the present status of a full-fledged institution. Today the college has 4700 regular students on the rolls, 24 departments (Arts, Science, Commerce and B.Voc) offering both Honours and Regular courses of study along with Post Graduate course in Assamese and Zoology. The college also have course in Post Graduate Diploma in Computer Science. There are 101 experienced teachers constantly rendering service for the development of the students. The Governing Body is the overall managing authority of the college. The Principal is the head of the institution. He has under him 54 non-teaching employees. The college functions according to the Assam Provincialized College Management Rules of 2006.

Dakshin Kamrup College has satisfactory infrastructural facilities- a well-stocked library, a separate administrative building, a Boys' common room, a Girls' common room, a well-built Girls' hostel (having 80 seats), the science departments with fully equipped laboratories and classrooms, Conference Hall, Digital Class Room, an indoor sports complex and a canteen etc. The construction of a scientific auditorium hall with a plane estimate of Rs. 5 crores are in progress. Besides these, a big plot of 26 bighas (3.48 hectares) has enriched the college assets where a 30 seated Boys' hostel, a big playground, a fishery and a plot of land for plantation project exist.

The college has a few adopted villages where the college fraternity has launched various educational, economic, developmental and health security schemes to empower the rural people as steps towards its community extension services.

The college has so far succeeded in facilitating advancement and dissemination of quality education. Many students have completed their courses of study in this college with academic distinction and established themselves as able and responsible citizens of the nation. But education is a dynamic process that needs renovation and upgradation, so as to meet the needs of a changing society. Therefore, to meet the challenges in education in the 21st century and to contribute to the knowledge-based economy, the college has proposed to prepare itself aptly.

1.1 VISION AND MISSION

The college aims not only at achieving excellence in higher education but also the all-round development - physical, intellectual, and moral - of the students. The famous Upanisadic hymn – "Tamaso Ma Jyotirgamaya" engraved in the emblem signifies the motto of the college. Thus, the college has noble mission to pursue. The vision of the college centres round its strong wish to become a centre of excellence in the academic field of the entire North Eastern Region. Apart from education it wants the young generation to reconstruct a society based on dignity of labour, moral and spiritual values. The institute aims at imparting futuristic education and instils high standards of discipline through its dedicated faculty. By making the students strong in physical science, social science and humanities and ethics the college aims at setting up a national standard.

1.2 TOTAL CAMPUS AREA & COLLEGE BUILDING SPREAD AREA

Campus area 383.47 m^2.

Built up area 237.67 m^2.

List of Places from Where Students Commute

Amranga	Barduar Tea Garden No.1	Batakuchi
Amring	Barduar Tea Garden No.2	Bejartari
Amtola	Barduar Tea Garden No.3	Beri Gaon
Andherijuli	Baregaon No.1	Betlanchi
Bagapani F.V.	Baregaon No.2	Betlanchi N.C.
Bahu Para	Barhanti Rangamati	Bhalakhowa
Bahuwa	Barkukuria	Bhalakhowa N.C.
Balahpur	Barpatima	Bhalla
Bangeli Bila N.C.	Bartari	Bhaluk F.V.
Bangshor	Bashimari F.V.	Bhaluk Khawa N.C.
Baniapara	Batabari	Bhatkhowadia N.C.
Baranti Maniari	Batabari Gaon	Bherbheri
Barbhui	Batabari N.C.	Bholapara
Bardia Gaon	Batabari Pathar	Biro Gaon
Bardia N.C.	Batabari Pathar N.C.	Biturtari

Bongara
Challi
Charaimari
Chayani Moniari
Chayani Rangamati
Choutala
Dahajatia
Dakhala
Dalong Molong F.V.
Darchala
Dariartari
Dewanbil F.V.
Dhalipar
Dhani Para
Dhantula Rangamati
Dhengargaon
Dighalkuchi
Dimali F.V.
Dole Gaon
Dumopaham N.C
Futuri No.1
Futuri No.2
Futuri No.3
Galiya F.V.
Garbhanga F.V.
Garo Para
Garubanda F.V.
Gatuwa
Ghoramara
Guimara
Haropara
Hatimura
Hudumpur
Jaji Gaon
Jalnamdani
Jaluk Paham N.C.
Japangbari
Jara Sal F.V.
Jarabari Gaon
Jiakur No.1
Jiakur No.2
Jimirigaon
Jimirigaon N.C.
Joypur
Joypur F.V.
Kachari Allibari
Kaita Sidhi
Kajalartari
Kalapani No.1
Kalapani No.2
Kalardia
Kallapara
Kallapara N.C.
Kamargaon
Kandulimari
Kanthang Paham N.C.
Karipara
Katal Para
Katal Para N.C.
Kawasing F.V.
Kenduri Gaon
Keotpara
Khena Alli Bari
Khonapara
Khope Gaon
Kokjar
Kumar Bori
Kuruwa
Losana
Madanpur
Magur Para
Mahmarang
Mairapur
Mairapur Grant
Majkuchi
Majpara
Maliata
Mallartari
Manik Pur F.V.
Marabhitha
Muhudi
Nagaon
Nagaon F.V.
Nalbari F.V.
Nalgaon
Nargaon
Nongtaria Paham N.C.
Pagladia N.C.
Panikhaiti
Parakuchi
Pat Gaon Bandha Para
Pat Gaon Bandha Para N.C.
Pat Haledhiya
Patgaon
Patgaon Barmokam

Pathelipara	Salbari F.V.	Sikarhati
Pazi Bindha	Salesala	Simina No.1
Puijala	Salmer	Simina No.2
Raja Para	Salmer N.C.	Singimari
Rajapanichanda	Santola	Siyalmara N.C.
Rajapukhuri	Sapartari	Sulikata
Rampur No.1	Sapathuri	Tangan Para
Rampur No.2	Sarania	Tatibama
Rampur No.3	Sasal Para No.2	Tezpur
Rangapara	Sasalpara No.1	Thengapara
Rani Khamar	Sathikarpa	Titua Gaon
Roumari	Satpakhali	Umchur
Sadilapur	Satpur	Umchur N.C.
Sajan Para	Sengaratari	Urput

1.3 PREVIOUS NAAC GRADING

NAAC accreditation First cycle: **B+** Grade, **76** (CGPA) in **2004.**

NAAC re-accreditation Second cycle: **B** Grade, **2.81** (CGPA) in **2014.**

1.4 CAMPUS INFRASTRUCTURE

Sudhakantha Dr. Bhupen Hazarika Auditorium

The college has an auditorium with a seating capacity of 1500 converging point of academic and cultural activities.

Girls' Common Room

The college has one Girls' Common Room which can accommodate 100 girls, aimed at conducting rehearsal for small scale events like music, dance and drama club activities and meetings of various student support organizations.

Boys' Common Room

The college has one Boys' Common Room which can accommodate 100 boys, aimed at conducting rehearsal for small scale events like music, dance and drama club activities and meetings of various student support organizations.

The Digitage Hall

The college has one seminar/ conference hall, equipped with audio-visual facilities for the smooth conduct of seminars, conferences and other activities.

Conference Room

The college has one conference hall, equipped with audio-visual facilities for the smooth conduct of seminars, conferences and other activities.

IQAC Room

The IQAC room has the offices of the Coordinators of IQAC.

Library

The college library is fully computerized and digitalized with Machine Readable Catalogue facility and has a collection of 56,759 books, 1,99,500 e-books and a subscription of about 25 hard copy of periodicals and 6000 e-journals. Internet browsing facility is also available.

Computer Labs

The college has three well-equipped computer labs.

D. K. College Canteen

The college canteen caters to the nutritional needs of the staff and students at subsidized rates. The canteen functions from 8.00 am to 4.30 pm.

Girls' Hostel

A full-fledged Girls' Hostel having all modern amenities which has been functioning for the last decade offers accommodation for girls. There are 80 number of seats, allotted on the basis merit. However, girls coming from places with inadequate transport and communication facilities are given priority. A separate form for admission to the hostel, obtainable from the Warden on the day of college admission, is to be filled.

Boys' Hostel

There are 50 number of seats, allotted on the basis merit. However, boys coming from places with inadequate transport and communication facilities are given priority. A separate form for admission to the hostel, obtainable from the Warden on the day of college admission, is to be filled.

Sports and Games facilities

The College has a Basketball Court, Shuttle Badminton Court, Fitness Centre etc.

Sports Complex

Built with UGC assistance, the college has an Indoor Sports Complex with state of the art equipment. It provides facilities for indoor sports and games.

Gymnasium

The college has a well-equipped gymnasium for students and college staff.

Green House

The Green House has a collection of orchids maintained by Advanced Level Institutional Biotech Hub, D.K. College, Mirza. The main objective of this orchid house is the collection and conservation of local orchid species of the region. of Assam.

Health Centre

The College has a Health Centre with basic facilities to serve faculty, staff and students of college.

National Service Scheme (NSS)

The college has a separate room for National Service Scheme (NSS).

National Cadet Corps (NCC)

The college has a separate room (temporary) for NCC.

Krishna Kanta Handiqui State Open University Centre

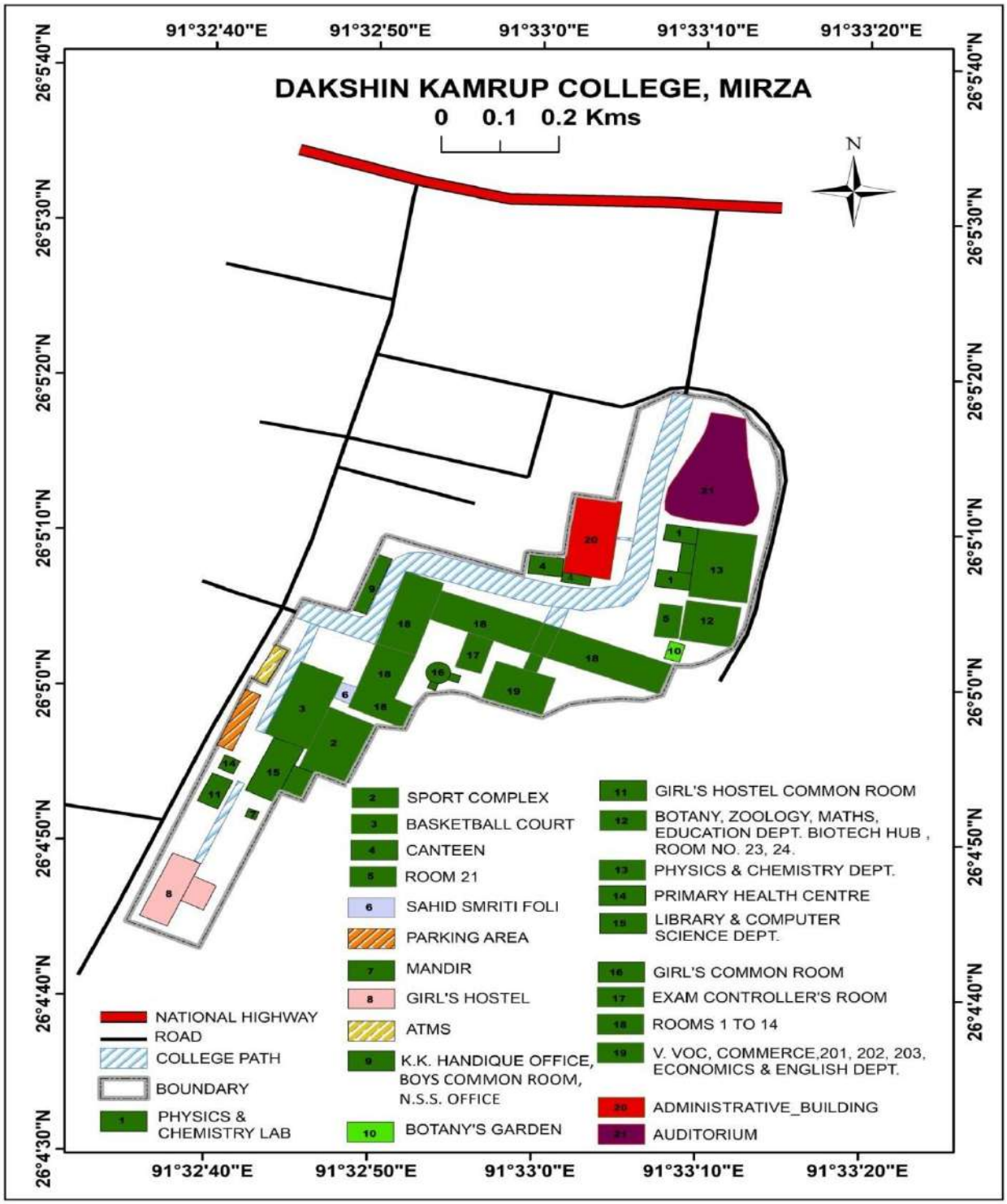
The college has a separate room for Krishna Kanta Handiqui State Open University (KKHSOU) Centre.

Solar Power Plant

The college has a rooftop solar power plant of 20 kVA installed in the campus.

BUILDING LAYOUT

DAKSHIN KAMRUP COLLEGE CAMPUS, MIRZA



Source: Data given by Department of Geography

CHAPTER 2

PRE-AUDIT STAGE

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the auditee and deal with any concerns. It was held at Dakshin Kamrup College on 29th November, 2021. The meeting was an opportunity to gather information that the audit team can study before arriving on the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance of the audit itself. In Dakshin Kamrup College pre-audit meeting was conducted successfully and necessary documents were collected directly from the college before the initiation of the audit processes. Actual planning of audit processes was discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the college management. The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself. The audit team worked together, under the leadership of the lead auditor, to ensure completion within the brief and scope of the audit.

2.1 COMMITMENT OF THE COLLEGE MANAGEMENT

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on the environment, campus farming, planting more trees on the campus etc., after the green auditing. The management of the college was willing to formulate policies based on green auditing report.

2.2 SCOPE AND GOALS OF GREEN AUDITING

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economical, financial, social, environmental factor. It is necessary to conduct green audit in college campus because students become aware of the green audit, its

advantages to save the planet and they become good citizen of our country. Thus, Green audit becomes necessary at the college level. A very simple indigenized system has been devised to monitor the environmental performance of Dakshin Kamrup College. It comes with a series of questions to be answered on a regular basis. This innovative scheme is user friendly and totally voluntary. The aim of this is to help the institution to set environmental examples for the community, and to educate the young learners.

2.3 BENEFITS OF THE GREEN AUDITING

- ✓ To provide basis for improved sustainability
- ✓ To create a green campus
- ✓ To enable waste management through reduction of waste generation, solid- waste and water recycling
- ✓ To create plastic free campus and evolve health consciousness among the stakeholders
- ✓ More efficient resource management
- ✓ Recognize the cost saving methods through waste minimizing and managing
- ✓ Point out the prevailing and forthcoming complications
- ✓ Authenticate conformity with the implemented laws
- ✓ Empower the organizations to frame a better environmental performance
- ✓ Enhance the alertness for environmental guidelines and duties
- ✓ Impart environmental education through systematic environmental management approach and Improving environmental standards
- ✓ Benchmarking for environmental protection initiatives
- ✓ Financial savings through a reduction in resource use
- ✓ Development of ownership, personal and social responsibility for the College and its environment
- ✓ Enhancement of college profile
- ✓ Developing an environmental ethic and value systems in youngsters.
- ✓ Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

2.4 TARGET AREAS OF GREEN AUDITING

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals,

and their results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency. All these indicators are assessed in process of "Green Auditing of educational institute". Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

2.4.1 AUDITING FOR WATER MANAGEMENT

Water is a natural resource; all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all, now and in the future. A small drip from a leaky tap can waste more than 180 liters of water to a day; that is a lot of water to waste - enough to flush the toilet eight times! It is therefore essential that any environmentally responsible institution should examine its water use practices. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible institution examine its water use practices.

2.4.2 AUDITING FOR ENERGY MANAGEMENT

Energy cannot be seen, but we know it is there because we can see its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60W to 100W while an energy efficient light emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

2.4.3 AUDITING FOR WASTE MANAGEMENT

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes, schools and colleges such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable college. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

2.4.4 AUDITING FOR GREEN CAMPUS MANAGEMENT

Biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's delicate balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings. Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to approximately 21 Kg of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. Trees on the campus impact the mental health of the students as well; studies have shown that trees greatly reduce stress, which a huge deal is considering many students are under some amount of stress.

2.4.5 AUDITING FOR CARBON FOOTPRINT MANAGEMENT

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 412.5 ppm of the Earth's atmosphere in 2020 higher than at any point in at least the past 800,000 years. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method travelled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examine its carbon footprint.

2.5 METHODOLOGY OF GREEN AUDITING

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The criteria, methods and recommendations used in the audit were based on the identified risks. The methodology includes: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the document, interviewing responsible persons and data analysis, measurements and recommendations. The methodology adopted for this audit was a three step process comprising of:

2.5.1 DATA COLLECTION

In preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements.

Following steps were taken for data collection:

- The team went to each department, centres, Library, canteen etc.

- Data about the general information was collected by observation and interview.
- The power consumption of appliances was recorded by taking an average value in some cases.

2.5.2 DATA ANALYSIS

Detailed analysis of data collected include: calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the Assam Power Distribution Company Limited (APDCL). Data related to water usages were also analysed using appropriate methodology.

2.5.3 RECOMMENDATION

On the basis of results of data analysis and observations, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. Use of fossil fuels has to be reduced for the sake of community health. The above target areas particular to the college was evaluated through questionnaire circulated among the students for data collection. Five categories of questionnaires were distributed. The formats of these are given below.

2.6 SURVEY FORMS

FORM I

Auditing for Water Management

1. List uses of water in your college.
2. What are the sources of water in your college?
3. How many Tube wells/ Bore well are there in your college?
4. No. of motors used for pumping water from each well?
5. What is the total horse power of each motor?
6. What is the depth of each Tube wells/ Bore well?
7. What is the present depth of water in each Tube wells/ Bore well?
8. How does your college store water?
9. Quantity of water stored in your overhead water tank? (in litres)
10. Quantity of water pumped every day? (in litres)
11. If there is water wastage, specify why.
12. How can the wastage be prevented / stopped?
13. Locate the point of entry of water and point of exit of waste water in your College.
14. Where does waste water come from?
15. Where does the waste water go?
16. What are the uses of waste water in your college?
17. What happens to the water used in your labs? Whether it gets mixed with ground water?
18. Is there any treatment for the lab water?
19. Whether green chemistry methods are practiced in your labs?
20. Write down four ways that could reduce the amount of water used in your college.
21. Record water use from the college water meter for twelve months.
22. Bimonthly water charges paid to water connections if any
23. No. of water coolers. Amount of water used per day? (in litres)
24. No. of water taps. Amount of water used per day?
25. No. of bath rooms in staff rooms, common, hostels amount of water used per day?
26. No. of toilet, urinals. Amount of water used per day?
27. No. of water taps in the canteen. Amount of water used per day?

28. Amount of water used per day for garden use.

29. No. of water taps in laboratories. Amount of water used per day in each lab?

30. Total use of water in each hostel?

31. At the end of the period, compile a table to show how many litres of water have been used in the college for each purpose.

32. Is there any water used for agricultural purposes?

33. Does your college harvest rain water?

34. If yes, how many rain water harvesting units are there? (Approx. amount)

35. How many of the taps are leaky? Amount of water lost per day?

36. Are there signs reminding people to turn off the water? Yes / No

37. Is there any waterless toilets? _____

38. How many water fountains are there? _____

39. How many water fountains are leaky? _____

40. Is drip irrigation used to water plants outside? YES/NO

41. How often is the garden watered?

42. Quantity of water used to watering the ground?

43. Quantity of water used for bus cleaning? (Litres per day)

44. Amount of water for other uses? (items not mentioned above)

45. Area of the college land without tree/building canopy.

46. Is there any water management plan in the college?

47. Are there any water saving techniques followed in your college? What are they?

48. Please share Some IDEA for how your college could save more water.

FORM II

Auditing for Energy Management

1. List ways that you use energy in your college. (Electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others).
2. Electricity bill amount for the last year (by month)
3. Amount paid for LPG cylinders for last one year (by month)
4. Weight of firewood used per month and amount of money spent?
Also mention the amount spent for petrol/diesel/ others for generators?
5. Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some.
6. How much money does your college spend on energy such as electricity, gas, firewood, etc. in a month. (Record monthly for the year 2020-21).
7. How many CFL bulbs has your college installed? Mention use (Hours used/day for how many days in a month)
8. Energy used by each bulb per month? (for example- 60-watt bulb x 4hours x number of bulbs = kwh).
9. How many LED bulbs are used in your college? Mention the use (Hours used/day for how many days in a month)
10. Energy used by each bulb per month? (kwh).
11. How many incandescent (tungsten) bulbs have your college installed? Mentions use (Hours used/day for how many days in a month)
12. Energy used by each bulb per month? (kwh).
13. How many fans are installed in your college? Mention use (Hours used/day for how many days in a month)
14. Energy used by each fan per month? (kwh)
15. How many air conditioners are installed in your college? Mention use (Hours used/day, for how many days in a month)
16. Energy used by each air conditioner per month? (kwh).
17. How many electrical equipment including weighing balance are installed your college? Mention the use (Hours used/day for how many days in a month)
18. Energy used by each electrical equipment per month? (kwh).

19. How many computers are there in your college? Mention the use (Hours used/day for how many days in a month)

20. Energy used by each computer per month? (kwh)

21. How many photocopiers are installed by your college? Mention use (Hours used/day for how many days in a month).

22. How many cooling apparatuses are in installed in your college? Mention use (Hours used/day for how many days in a month)

23. Energy used by each cooling apparatus per month? (kwh)

Mention use (Hours used/day for how many days in a month)

24. Energy used by each photocopier per month? (kwh) Mention the use (Hours used/day for how many days in a month) how many inverters your college installed? Mentions use (Hours used/day for how many days in a month)

25. Energy used by each inverter per month? (kwh)

26. How many electrical equipment are used in different labs of your college?

Mention the use (Hours used/day for how many days in a month)

27. Energy used by each equipment per month? (kwh)

28. How many heaters are used in the canteen of your college? Mention the use (Hours used/day for how many days in a month)

29. Energy used by each heater per month? (kwh)

30. No of street lights in your college?

31. Energy used by each street light per month? (kwh)

32. No of TV in your college and hostels?

33. Energy used by each TV per month? (kwh)

34. Any other item that uses energy (Please write the energy used per month) Mention the use (Hours used/day for how many days in a month)

35. Are any alternative energy sources/nonconventional energy sources employed / installed in your college? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.

36. Do you run “switch off” drills at college?

37. Are your computers and other equipment put on power-saving mode?

38. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby mode most of the time? If yes, how many hours?

39. What are the energy conservation methods adapted by your college?

40. How many boards displayed for saving energy awareness?

41. How much ash is collected after burning fire wood per day in the canteen?

42. Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

Calculation of energy for electrical appliances

Appliance	Power used in (watt)	Usage per day (hours)	Number of appliances	Average kWh per day (Watt X hours X Number X 1000)	Average kWh per month (Watt X hours X Number X 1000 x 30)
Incandescent bulb					
CFL					
LED					
Other appliances					

FORM III

Auditing for Waste Management

1 What is the total strength of students, teachers and Non-teaching staff in your College?

	No. of Students	No. of Teachers No.	Non-teaching staff
Gents			
Ladies			
Total			

2 Which of the following are available in your College? Give area occupied and number

Garden area	Garbage dump (number)
Playground area	Laboratory
Kitchen	Canteen
Toilets (number)	Car/scooter shed area
Number of class rooms	Office rooms
Others (specify)	

3 Which of the following are found near your college?

Mark the level of disturbance it creates for the college in a scale of 1 to 9.

Municipal dump yard

Garbage heap

Public convenience

Sewer line

Stagnant water

Open drainage

Industry – (Mention the type)

Bus / Railway station

Market / Shopping complex / Public halls

WASTE

Does your college generate any waste?

If so, what are they? How much quantity? Number or weight

E-waste

Hazardous waste (toxic)

Solid waste

Dry leaves

Canteen waste

Liquid waste

Glass

Unused equipment

Medical waste if any

Napkins

Others (Specify)

Is there any waste treatment system in the college?

Is there any treatment for toilet/urinal/sanitary napkin waste?

1. What is the approximate quantity of waste generated per day? (in Kilograms)

Office

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg				
> 10 kg.				

Laboratories

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg				
> 10 kg.				

Canteen/kitchen

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg				
> 10 kg.				

2. Why waste is a problem?

3. Whether waste is polluting ground/surface water? How?

4. Whether waste is polluting the air of the college? How?

5. How is the waste generated in the college managed? Methods

   i. Composting

   ii. Recycling

iii. Reusing

iv. Others (specify)

6. How many separate boxes do you think you would need to put into a classroom to start a waste segregation and recycling campaign? What should be the use for each box? (Develop a colour code with reasons)

7. Do you use recycled paper in College?

8. Is there any waste wealth program practiced in the college?

9. How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.

10. Can you achieve zero garbage in your college? (Reduce, Recycle, Reuse, Refuse) If yes, how?

FORM IV

Auditing for Green Campus Management

1. Is there a garden in your college? Area?
2. Do students spend time in the garden?
3. List the plants in the garden, with approx. numbers of each species.
4. Suggest plants for your campus. (Trees, vegetables, herbs, etc.)
5. List the species planted by the students, with numbers.
6. Whether you have displayed scientific names of the trees in the campus?
7. Is there any plantations in your campus? If yes specify area and type of plantation.
8. Is there any vegetable garden in your college? If yes, how much area?
9. Is there any medicinal garden in your college? If yes, how much area?
10. What are the vegetables cultivated in your vegetable garden? (Mention the quantity of harvest in each season)
11. How much water is used in the vegetable garden and other gardens? (Mention the source and quantity of water used).
12. Who is in charge of gardens in your college?
13. Are you using any type of recycled water in your garden?
14. List the name and quantity of pesticides and fertilizers used in your gardens?
15. Whether you are doing organic farming in your college? How?
16. Do you have any composting pit in your college? If yes, what are you doing with the compost generated?
17. What do you doing with the vegetables harvested? Do you have any student market?
18. Is there any botanical garden in your campus? If yes give the details of campus flora.
19. Give the number and names of the medicinal plants in your college campus.
20. Any threatened plant species planted/conserved?
21. Is there a nature club in your college? If yes, what are their activities?
22. Is there any arboretum in your college? If yes details of the trees planted.
23. Is there any fruit yielding plants in your college? If yes details of the trees planted.
24. Is there any groves in your college? If yes details of the trees planted.
25. Is there any irrigation system in your college?
26. What is the type of vegetation in the surrounding area of the college?
27. What are the nature awareness programmes conducted in the campus? (2020-21)

28. What is the involvement of students in the green cover maintenance?

29. What is the total area of the campus under tree cover? Or under tree canopy?

30. Share your IDEAS for further improvement of green cover.

FORM V

Auditing for Carbon Footprint

1. What is the total strength of students and teachers in your College?

	No. of Students	No. of Teachers	No. of Non-teaching staff
Gents			
Ladies			
Total			

2. Total Number of vehicles used by the stakeholders of the college. (per day)

3. No. of cycles used

4. No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day)

5. No. of cars used (average distance travelled and quantity of fuel and amount used per day)

6. No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used per day)

7. No. of persons using college conveyance by the students, non-teaching staff and teachers (average distance travelled and quantity of fuel and amount used per day)

8. Number of parent-teacher meetings in a year? Parents turned up (approx.)

9. Number of visitors with vehicles per day?

10. Number of generators used per day (hours). Give the amount of fuel used per day.

11. Number of LPG cylinders used in the canteen (Give the amount of fuel used per day and amount spent).

12. Quantity of kerosene used in the canteen/labs (Give the amount of fuel used per day and amount spent).

13. Amount of taxi/auto charges paid and the amount of fuel used per month for the transportation of vegetables and other materials to canteen.

14. Amount of taxi/auto charges paid per month for the transportation of office goods to the college.

15. Average amount of taxi/auto charges paid per month by the stakeholders of the college.

16. Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent).

17. Suggest the methods to reduce the quantity of use of fuel used by the stakeholders/ students/ teachers/ non-teaching staff of the college.

CHAPTER 3

AUDIT STAGE

In Dakshin Kamrup College green auditing was done with the help of Prof. Subhendu Sekhar Bag, (CChem, FRSC, FICS) Professor, Department of Chemistry & Centre for the Environment, IIT Guwahati and his team involving different student groups, teaching and non-teaching staff. The green audit began with the teams walking through all the different facilities at the college, determining the different types of appliances and utilities (lights, taps, toilets, fridges, etc.) as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified several times to clarify the data received through survey and discussions. The whole process was completed within one months from 1st December 2021 to 21st December 2021.

3.1 STUDENT AND STAFF INVOLVED IN GREEN AUDITING

General Co-Ordinator: Dr. Jilmil Bora, Department of English

1. Water Management

Office in Charge: Mr. Jatindra Medhi, SA, Dakshin Kamrup College

Office Staff

Sl. No.	Name	Department
1	Phanidhar Nath	Office Staff
2	Sankar Das	Office Staff
3	Guneswar Das	Office Staff

2. Green Campus Management

Faculty in Charge: Dr. Durlav Narayan Singha, Department of Botany

Dr. Gargi Chakravarty, Department of Botany

Students

Sl. No.	Name	Department
1	Khanjan jyoti Saikia	Physics
2	Kuki Kalita	Botany

3	Dhanraj Das	Zoology

3. Carbon Footprint

Faculty in Charge: Mr. Utpal Das, Department of Chemistry

Students

Sl. No.	Name	Department
1.	Nirupam Das	Chemistry
2.	Himangshu Das	Chemistry
3.	Kaustavmoni Das	Chemistry

4. Energy Management

Faculty in Charge: Dr. Jnanendra Upadhyay, Department of Physics

Students

Sl. No.	Name	Department
1	Chitra Jyoti	Physics
2	Mrinmoy Talukdar	Physics
3	Hrishikesh Nath	Physics

5. Waste Management

Faculty in Charge: Mr. Manabendra Kalita, Department of Biotechnology

Students

Sl. No.	Name	Department
1.	Deepjyoti Medhi	Botany
2.	Nandita Boro	B.Sc. (Regular Course)
3.	Tangrik Chera	Botany

3.2 STUDENT CLUBS AND FORUMS

Eco Club

Faculty in Charge: Mrs. Ellora Choudhury, Department of Zoology

Mrs. Bharati Das, Department of Environmental Studies

Students

Sl. No.	Name	Department
1	Nicee Mali	Zoology
2	Sunny Kalita	Botany
3	Ankita Mazumder	Chemistry

Green Diary

Faculty in Charge: Dr. Madhuri Saikia, Department of History

Ms. Mainee Pathak, Department of Psychology

Students

Sl. No.	Name	Department
1	Madhusmita Kalita	History
2	Sajid Hussain	History
3	Syamashis Choudhury	B.A. (Regular Course)

Women's Cell

Faculty in Charge: Dr. Gargee Chakraborty, Department of English

Ms. Rinti Roy, Department of Botany

Students

Sl. No.	Name	Department
1	Dikshita Kalita	English
2	Banasmita Das	Economics
3	Dhritismita Das	Zoology

Career Guidance Cell

Faculty in Charge: Dr. Archana Mali, Department of Economics

Students

Sl. No.	Name	Department
1	Chindrani Chinaki	Economics
2	Deepjyoti Medhi	Botany
3	Chiranjit Das	B. Voc

Mentoring Cell

Faculty in Charge: Dr. Kumud Bhagabati, Department of Economics

Students

Sl. No.	Name	Department
1	Rimly Richa Pathak	Economics
2	Rituraj Boro	Political Science
3	Jugantar Kalita	Zoology

Flora and Fauna

Faculty in Charge: Dr. Nripendra Kumar Chowdhury, Department of Zoology

Dr. Karuna Kanta Das, Department of Botany

Students

Sl. No.	Name	Department

1.	Dipjyoti Medhi	Botany
2.	Karishma Gogoi	Zoology
4.	Sidhant Patgiri	Zoology

Science Forum

Faculty in Charge: Dr. Durlav Narayan Singha, Department of Botany

Mr. Jayanta Kumar Baishya, Department of Chemistry

Students

Sl. No.	Name	Department
1	Susankar Basak	Physics
2	Trishna Medhi	Chemistry
3	Kankana Kakoti	Botany

Environment and Climate Cell

Faculty in Charge: Mr. Manabendra Kalita, Department of Biotechnology

Students

Sl. No.	Name	Department
1	Heerokjyoti kalita	Botany
2	Dhritismita Roy Choudhury	Botany
3	Karishma Gogoi	Zoology

Entrepreneur Club

Faculty in Charge: Dr. Archana Mali, Department of Economics

Mr. Swarup Jyoti Sarma, Department of Vocational Studies

Students

Sl. No.	Name	Department
1.	Chindrani Chinaki	Economics
2.	Deepjyoti Medhi	Botany
3	Chiranjit Das	B.Voc

National Service Scheme (NSS)

Faculty in Charge: Mr. Ashim Ranjan Sarma, Department of Education

Mr. Adward Steady N. Sangma, Department of Assamese

Students

Sl. No.	Name	Department
1	Deepjyoti Das	B.A. (Regular Course)
2	Gautam Kalita	B.A. (Regular Course)

3	Sumit Kalita	H.S. (Regular Course)

National Cadet Corps (NCC)

Faculty in Charge: Mr. Sourabh Jyoti Sarma, Department of Political Science

Students

Sl. No.	Name	Department
1	Sourav Pandit	B.A. (Regular Course)
2	Pritam Jyoti Nath	B.Sc. (Regular Course)
3	Shruti Boro	Political Science

Library Book Club

Faculty in Charge: Mr. Manash Pratim Baruah, Department of Political Science (Advisor)

Dr. Priyanka Kumar, Department of Physics

Ms. Anuradha Gogoi, Department of Economics

Students

Sl. No.	Name	Department
1	Anamika Nath	Economics
2	Nitul Chakraborty	Physics
3	Manash Pratim Das	Physics

Red Ribbon Club (RRC)

Faculty in Charge: Mr. Adward Steady N. Sangma, Department of Assamese

Students

Sl. No.	Name	Department
1	Shristi Kalita	Political Science
2	Gautam Kalita	B.A. (Regular Course)
3	Hirak Jyoti Mali	Assamese

Sahitya Chora

Faculty in Charge: Dr. Niva Thakuria, Department of Assamese

Students

Sl. No.	Name	Department
1	Nilakshi Das	Assamese
2	Doli Das	Assamese
3	Jyotshna Nath	Assamese

English Study Forum

Faculty in Charge: Dr. Jilmil Bora, Department of English

Students

Sl. No.	Name	Department
1	Ankita Das	English
2	Pooja Rabha	English
3	Rupam Kalita	English

Education Forum

Faculty in Charge: Mrs. Bhabani Baishya, Department of Education

Students

Sl. No.	Name	Department
1	Gitanjali Kalita	Education
2	Leena Das	Education
3	Ankita Kalita	Education

Philosophical Society

Faculty in Charge: Dr. Aditi Devi Choudhury, Department of Philosophy

Students

Sl. No.	Name	Department
1	Bhupali Kumari	Philosophy
2	Nikita Kalita	Philosophy
3	Rittra Kalita	Philosophy

Political Science Progressive Society

Faculty in Charge: Mr. Manash Pratim Baruah, Department of Political Science

Students

Sl. No.	Name	Department
1	Ritumoni Das	Political Science
2	Anjan Das	Political Science
3	Simran Snigdha	Political Science

Students' Aid Fund

Faculty in Charge: Mr. Ashim Ranjan Sarma, Department of Education

Office in Charge : Mr. Jatindra Medhi, SA, Dakshin Kamrup College

Student's Union

President: Dr. Nabajyoti Das, Principal, Dakshin Kamrup College

Students

Sl. No.	Designation	Name
1	President	Nabajyoti Das
2	Vice President	Nikumoni Devi
3	General Secretary	Bhabesh Das
4	Assistant General Secretary	Anita Medhi
5	Sports	Shyamsish Choudhury
6	Cultural	Champak Das
7	Social Service	Binoyjyoti Rabha
8	Magazine	Pragyan Choudhury
9	Debate	Yasmin Hussain
10	Boys' common room	Darpanjyoti Bhagawati
11	Girls' Common room	Nirmali Das
12	Gymnasium	Suman Kalita

Besides the above, the college have the following cells and forums like Botanical Forum, Mathematical Forum, Economics Forum, Dakshin Kamrup College Study Forum and Historical Study Forum.

3.3 COMMENTS ON SITE TOUR

Site inspection was done along with students and staff. Questionnaires were answered during the site tour. Students and staff took much interest in the data collection processes. It was quite interesting and fascinating. It was an environmental awareness program for the students who participated in the green auditing. The experience of green auditing was totally a new experience for most of the students. They have shared their expectations about a green campus and gave suggestions for the audit recommendations.

3.4 REVIEW OF DOCUMENTS AND RECORDS

Documents such as admission registers, registers of electricity, laboratory equipment registers, purchase register, audited statements, and office registers were examined and data were collected. College calendars, college magazines, annual report of the college and NAAC self-assessment reports, UGC report etc. were also verified as part of data collection.

3.5 REVIEW OF POLICIES

Discussions were made with the college management regarding their policies on environmental management. Future plans of the college were also discussed. The management would formulate a revised environment /green policy for the college in the light of green auditing. The purpose of the green audit was to ensure that the practices followed in the campus are to be in accordance with the Green Policy adopted by the institution.

3.6 INTERVIEWS

In order to collect information for green auditing different audit groups interviewed office staff, Principal, teaching and non-teaching staff, students, parents and other stakeholders of the college. Discussions were also made with the office bearers to clarify doubts regarding certain points.

3.7 SITE INSPECTION

College and its premises were visited and analysed by the audit-teams several times to gather information. Campus trees were counted and identified. Vegetable garden, play grounds, canteen, library, office rooms and parking grounds were also visited to collect data. Number and type of vehicles used by the stakeholders were counted and fuel consumption for each vehicle was verified with the user. Number of LPG cylinders used in labs, canteen and hostel kitchen were also counted.

CHAPTER 4

POST AUDIT STAGE

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner. Green audits form a part of a process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit. The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components are crucial in ensuring that the organisation's environmental performance meets the goals set in its green policy. The individual functioning and the success of integration will all play a role in the degree of success or failure of the organisation's environmental performance.

4.1 KEY FINDINGS AND OBSERVATIONS

4.1.1 WATER

Main water uses in the campus

- ✓ Garden
- ✓ Laboratory
- ✓ Cleaning
- ✓ Canteen
- ✓ Drinking
- ✓ Toilets
- ✓ Bathrooms
- ✓ Hostel
- ✓ Washing
- ✓ Office uses

- The sources of water in the college are bore well.
- There are 3 bore wells in the college.

- 3 Numbers of motors used for pumping the water in the college.
- There are 3 motor of 1.0 Horse Power.
- The depth of deepest bore well is 800 feet.
- The present depth of water in each bore wells is 250 feet.
- The college store its water in reservoirs and tanks.
- Number of water tanks for water storage is 11.
- Quantity of water stored in overhead water tank is 15,000 litres.
- 5100 litres of water pumped every day in the campus.
- There is no water wastage from the water supply process.
- To prevented / stopped wastage of water the college author has been taken proper monitoring and preventive measures.
- The college laboratories practice green and sustainable methods in the labs.
- The college follows four basic ways that could reduce the amount of water usage in the campus, which are leakage monitoring, minimizing use of water in toilets and bathroom, used wastewater in garden and ground.
- Number of water tap in the campus is 208.
- Number of toilets and urinals in the campus are 68.
- Number of water taps in canteen are 2.
- 180 litres of water is used per day for gardening.
- A total 40 numbers of water taps are there in laboratories.
- Water used in hostel is 2000 litres.
- There is no leaky tap in the campus.
- There is no water treatment plant in college campus.
- Awareness among all the college fraternity, display on optimal usage of water, code of conduct if necessary, reuse and recycle of water are some of the initiatives taken by the management.
- Water charges paid – No water charges (No municipal water supply, using water from own bore wells)

Overall utilization of water in the College

Sections	Water Use/day
Toilets and urinals	2000 litres
Hostel and bathrooms	2000 litres

Canteen	500 litres
Garden and ground	100 litres
Laboratories	500 litres
Leakage	0 litres
Total	5100 litres

4.1.2 ENERGY

- Electricity, LPG, diesel and solar are the sources of energy in the college.
- Electricity bill amount for the last month (₹1,25,000.00)
- ₹ 4,000.00 paid for LPG cylinders for the last month.
- 10 litres of diesel is used for generators per month and ₹1,000.00 is spent for the last month.
- Use of solar energy, rain water harvesting, no motor vehicle day, use of public vehicle and use of bi-cycle are some energy saving methods employed in the college.
- ₹ 1,30,000.00 is spend on energy such as electricity, gas, and diesel in a month. (Record monthly for the year 2020-21).
- There is no incandescent (tungsten) bulbs in the college.
- There is 4 cooling apparatus are in the college.
- There are no heaters in the college.
- 20 kW Solar energy system is the only alternative energy sources/nonconventional energy sources installed in the college.
- All the computers and other equipment are switch off after use.
- The machineries like computer, weighing balance, printers, etc. are not run on standby mode.
- Rain water harvesting, optimum use of water and reusability, sensor based device in water tank, proper monitoring of all electric appliances, awareness and sign of switch-off the device after use are energy conservation methods adapted by the college.
- Total number of CFL bulbs –158
- Number of LED lights –609
- Number of Fans –611
- Number of Tube Lights –208
- Total Electrical Equipment – 46
- Number of Computers – 127
- Number of Photocopiers – 1

- Number of LCD Monitors – 4
- Number of AC – 26
- Number of CCTV Camera – 10
- Number of Printers – 14
- Number of Gas Cylinder – 12
- Number of Projectors – 12
- Number of Amplifiers – 4
- Number of Exhaust Fans – 28
- Number of Halogen Lights in Indoor Stadium – 8

Energy usage of CFL bulbs in the college

Department/area	Number of CFL bulbs	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Teachers' Common Room	2	15	0.015	6	3.96
Principal Room	34	15	0.015	6	67.32
Department of Environmental Studies	2	15	0.015	6	3.96
Center for Media Study	4	15	0.015	6	7.92
The Digitage Hall	14	15	0.015	6	27.72
Room No. 27	1	15	0.015	6	1.98
Department of Geography	3	15	0.015	6	5.94
Department of History	3	15	0.015	6	5.94
Room No. 25	1	15	0.015	6	1.98
HS Physics Lab	2	15	0.015	6	3.96
Corridoor	1	15	0.015	6	1.98
Museum cum Library	1	15	0.015	6	1.98
Zoology Class Room 1	2	15	0.015	6	3.96
Zoology Class Room 2	4	15	0.015	6	7.92
Zoology Class Room 3	3	15	0.015	6	5.94
Entomology Lab	3	15	0.015	6	5.94
HS Zoology Lab	1	15	0.015	6	1.98
Education Lab	1	15	0.015	6	1.98
HS Botany Lab	5	15	0.015	6	9.9

Botany Degree Class	6	15	0.015	6	11.88
Theory cum Practical Lab 1	4	15	0.015	6	7.92
Research Room	1	15	0.015	6	1.98
Mathematics Computer Lab	2	15	0.015	6	3.96
Mathematics Class Room 1	1	15	0.015	6	1.98
Mathematics Class Room 2	2	15	0.015	6	3.96
Mathematics Faculty Room	2	15	0.015	6	3.96
Room No. 11	1	15	0.015	6	1.98
Room No. 17	1	15	0.015	6	1.98
English Class Room	2	15	0.015	6	3.96
English Faculty Room	5	15	0.015	6	9.9
Economics Class Room	2	15	0.015	6	3.96
Economics Faculty Room	5	15	0.015	6	9.9
B. VOC Room No. 2	1	15	0.015	6	1.98
B. VOC Room No. 1	5	15	0.015	6	9.9
Room No. 8	1	15	0.015	6	1.98
Room No. 7	1	15	0.015	6	1.98
Political Science Faculty Room	2	15	0.015	6	3.96
Room No. 9	1	15	0.015	6	1.98
Department of Assamese	1	15	0.015	6	1.98
Office of IQAC	1	15	0.015	6	1.98
Girls Common Room	2	15	0.015	6	3.96
Room No. 3	1	15	0.015	6	1.98
Sports Complex cum Indoor Stadium	8	15	0.015	6	15.84
Health Centre	1	15	0.015	6	1.98
Library	6	15	0.015	6	11.88
Computer Science Faculty Room	2	15	0.015	6	3.96
Computer Lab	2	15	0.015	6	3.96
South Kamrup Students' Union	1	15	0.015	6	1.98
National Cadet Corps Room	1	15	0.015	6	1.98
Total Energy usage per month (kWh)					312.84

Energy usage of LED bulbs in the college

Department/area	Number of LED bulbs	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Head Assistant Room	1	10	0.01	6	1.32
Teachers' Common Room	1	10	0.01	6	1.32
Office	7	10	0.01	6	9.24
Principal Room	2	10	0.01	6	2.64
Corridor 1st Floor	1	10	0.01	6	1.32
Center for Media Study	6	10	0.01	6	7.92
Room No. 27	2	10	0.01	6	2.64
Department of Geography	5	10	0.01	6	6.6
Department of History	2	10	0.01	6	2.64
Corridor 2nd Floor	2	10	0.01	6	2.64
D. K. College Canteen	4	10	0.01	6	5.28
Sudhakantha Dr. Bhupen Hazarika Auditorium	78	10	0.01	6	102.96
Room No. 1	2	10	0.01	6	2.64
HS Physics Lab	7	10	0.01	6	9.24
Science Building Corridor	8	10	0.01	6	10.56
Science Building Room 1	3	10	0.01	6	3.96
Science Building Room 2	3	10	0.01	6	3.96
Physics Mechanical and Thermodynamic Lab	9	10	0.01	6	11.88
Physics Dark Room	2	10	0.01	6	2.64
Chemistry Lab 1	9	10	0.01	6	11.88
Zoology Lab	6	10	0.01	6	7.92
Chemistry Lab 2	8	10	0.01	6	10.56
Physics Electronics, Electricity, Computer Lab	8	10	0.01	6	10.56
Physics Dark Room 2	2	10	0.01	6	2.64
Physics Faculty Room	6	10	0.01	6	7.92
Physics Material Research Lab	5	10	0.01	6	6.6
Science Building Room 101	2	10	0.01	6	2.64
Science Building Room 102	3	10	0.01	6	3.96
Chemistry Faculty Room	5	10	0.01	6	6.6
Chemistry Class Room	4	10	0.01	6	5.28
HS Chemistry Lab	4	10	0.01	6	5.28
Room No. 21	9	10	0.01	6	11.88
Zoology Faculty Room	5	10	0.01	6	6.6
Cell Biology Lab	3	10	0.01	6	3.96
Museum cum Library	3	10	0.01	6	3.96

Zoology Lab	5	10	0.01	6	6.6
Zoology Class Room 1	2	10	0.01	6	2.64
Zoology Class Room 2	3	10	0.01	6	3.96
Zoology Class Room 3	3	10	0.01	6	3.96
Entomology Lab	1	10	0.01	6	1.32
HS Zoology Lab	4	10	0.01	6	5.28
Education Faculty Room	2	10	0.01	6	2.64
Education Lab	5	10	0.01	6	6.6
Botany Faculty Room	4	10	0.01	6	5.28
Botany Store Room	3	10	0.01	6	3.96
Botany Class Room 1	4	10	0.01	6	5.28
Botany Class Room 2	7	10	0.01	6	9.24
HS Botany Lab	1	10	0.01	6	1.32
Theory cum Practical Lab 2	3	10	0.01	6	3.96
Room No. 22	6	10	0.01	6	7.92
Room No. 23	2	10	0.01	6	2.64
Room No. 24	2	10	0.01	6	2.64
Mathematics Class Room 1	1	10	0.01	6	1.32
Mathematics Faculty Room	1	10	0.01	6	1.32
Room No. 14	9	10	0.01	6	11.88
Room No. 13	9	10	0.01	6	11.88
Room No. 12	7	10	0.01	6	9.24
Room No. 10 C	1	10	0.01	6	1.32
Room No. 10 B	1	10	0.01	6	1.32
Room No. 16	1	10	0.01	6	1.32
Room No. 15	1	10	0.01	6	1.32
Boys Common Room	16	10	0.01	6	21.12
Student Union	3	10	0.01	6	3.96
English Faculty Room	5	10	0.01	6	6.6
Computer & Bio-Information Lab	8	10	0.01	6	10.56
Economics Faculty Room	1	10	0.01	6	1.32
Room No. 203	4	10	0.01	6	5.28
Room No. 202	2	10	0.01	6	2.64
Room No. 201	4	10	0.01	6	5.28
Department of Commerce	2	10	0.01	6	2.64
B. VOC Computer Lab	16	10	0.01	6	21.12
B. VOC	8	10	0.01	6	10.56
B. VOC Room No. 3	1	10	0.01	6	1.32
B. VOC Room No. 2	3	10	0.01	6	3.96
B. VOC Room No. 1	1	10	0.01	6	1.32
Room No. 18	1	10	0.01	6	1.32

Room No. 19	1	10	0.01	6	1.32
Room No. 8	2	10	0.01	6	2.64
Room No. 7	4	10	0.01	6	5.28
Political Science Faculty Room	2	10	0.01	6	2.64
MA Class Room	5	10	0.01	6	6.6
Room No. 9	1	10	0.01	6	1.32
Room No. 10	1	10	0.01	6	1.32
Department of Assamese	3	10	0.01	6	3.96
MA Library	2	10	0.01	6	2.64
Office of IQAC	4	10	0.01	6	5.28
Assamese Store Room	1	10	0.01	6	1.32
Examination Control Room	10	10	0.01	6	13.2
Department of Philosophy	4	10	0.01	6	5.28
Room No. 6	5	10	0.01	6	6.6
Room No. 4	5	10	0.01	6	6.6
Girls Common Room	12	10	0.01	6	15.84
Room No. 4	8	10	0.01	6	10.56
Room No. 2	7	10	0.01	6	9.24
Room No. 1	4	10	0.01	6	5.28
Room No. 3	2	10	0.01	6	2.64
Krishna Kanta Handiqui State Open University Centre	5	10	0.01	6	6.6
National Service Scheme Room	1	10	0.01	6	1.32
Alumini Room	1	10	0.01	6	1.32
Library	15	10	0.01	6	19.8
Computer Science Faculty Room	2	10	0.01	6	2.64
Computer Lab	7	10	0.01	6	9.24
Computer Class Room 1	5	10	0.01	6	6.6
Warden's Quarter	14	10	0.01	6	18.48
Women's Hostel	80	10	0.01	6	105.6
Computer Class Room 2	6	10	0.01	6	7.92
Total Energy usage per month (kWh)					803.88

Energy usage of Fans in the college

Department/area	Number of Fans	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Head Assistant Room	3	40	0.04	6	15.84
Teachers' Common Room	4	40	0.04	6	21.12
Office	11	40	0.04	6	58.08

Principal Room	5	40	0.04	6	26.4
Corridor 1st Floor	3	40	0.04	6	15.84
Department of Environmental Studies	1	40	0.04	6	5.28
Center for Media Study	5	40	0.04	6	26.4
Room No. 27	5	40	0.04	6	26.4
Department of Geography	8	40	0.04	6	42.24
Department of History	9	40	0.04	6	47.52
Room No. 25	2	40	0.04	6	10.56
Corridor 2nd Floor	2	40	0.04	6	10.56
D. K. College Canteen	4	40	0.04	6	21.12
Room No. 1	2	40	0.04	6	10.56
HS Physics Lab	8	40	0.04	6	42.24
Science Building Room 1	5	40	0.04	6	26.4
Science Building Room 2	5	40	0.04	6	26.4
Physics Mechanical and Thermodynamic Lab	12	40	0.04	6	63.36
Physics Dark Room	2	40	0.04	6	10.56
Chemistry Store Room	3	40	0.04	6	15.84
Chemistry Lab 1	1	40	0.04	6	5.28
Zoology Lab	3	40	0.04	6	15.84
Chemistry Lab 2	6	40	0.04	6	31.68
Physics Electronics, Electricity, Computer Lab	8	40	0.04	6	42.24
Physics Faculty Room	6	40	0.04	6	31.68
Physics Material Research Lab	4	40	0.04	6	21.12
Science Building Room 101	5	40	0.04	6	26.4
Science Building Room 102	7	40	0.04	6	36.96
Chemistry Faculty Room	3	40	0.04	6	15.84
Chemistry Class Room	6	40	0.04	6	31.68
Room No. 21	9	40	0.04	6	47.52
Zoology Faculty Room	4	40	0.04	6	21.12
Cell Biology Lab	1	40	0.04	6	5.28
Museum cum Library	1	40	0.04	6	5.28
Zoology Lab	4	40	0.04	6	21.12
Zoology Class Room 1	4	40	0.04	6	21.12
Zoology Class Room 2	2	40	0.04	6	10.56
Zoology Class Room 3	2	40	0.04	6	10.56
Entomology Lab	2	40	0.04	6	10.56
HS Zoology Lab	3	40	0.04	6	15.84
Education Faculty Room	3	40	0.04	6	15.84
Education Lab	4	40	0.04	6	21.12
Botany Faculty Room	3	40	0.04	6	15.84

Botany Store Room	1	40	0.04	6	5.28
Botany Class Room 1	2	40	0.04	6	10.56
Botany Class Room 2	5	40	0.04	6	26.4
HS Botany Lab	3	40	0.04	6	15.84
Theory cum Practical Lab 2	2	40	0.04	6	10.56
Botany Degree Class	2	40	0.04	6	10.56
Theory cum Practical Lab 1	2	40	0.04	6	10.56
Research Room	1	40	0.04	6	5.28
Room No. 22	2	40	0.04	6	10.56
Room No. 23	9	40	0.04	6	47.52
Mathematics Computer Lab	2	40	0.04	6	10.56
Room No. 24	5	40	0.04	6	26.4
Mathematics Class Room 1	2	40	0.04	6	10.56
Mathematics Class Room 2	2	40	0.04	6	10.56
Mathematics Faculty Room	3	40	0.04	6	15.84
Room No. 14	6	40	0.04	6	31.68
Room No. 13	6	40	0.04	6	31.68
Room No. 12	5	40	0.04	6	26.4
Room No. 11	2	40	0.04	6	10.56
Room No. 10 C	2	40	0.04	6	10.56
Room No. 10 B	2	40	0.04	6	10.56
Room No. 17	2	40	0.04	6	10.56
Room No. 16	2	40	0.04	6	10.56
Room No. 15	2	40	0.04	6	10.56
Boys Common Room	15	40	0.04	6	79.2
Student Union	2	40	0.04	6	10.56
Gymnasium	2	40	0.04	6	10.56
English Class Room	4	40	0.04	6	21.12
English Faculty Room	6	40	0.04	6	31.68
Computer & Bio-Information Lab	4	40	0.04	6	21.12
Economics Class Room	4	40	0.04	6	21.12
Economics Faculty Room	4	40	0.04	6	21.12
Room No. 203	10	40	0.04	6	52.8
Room No. 202	4	40	0.04	6	21.12
Room No. 201	8	40	0.04	6	42.24
Department of Commerce	1	40	0.04	6	5.28
B. VOC	2	40	0.04	6	10.56
B. VOC Room No. 3	3	40	0.04	6	15.84
B. VOC Room No. 2	5	40	0.04	6	26.4

B. VOC Room No. 1	5	40	0.04	6	26.4
Room No. 18	2	40	0.04	6	10.56
Room No. 19	2	40	0.04	6	10.56
Room No. 8	5	40	0.04	6	26.4
Room No. 7	5	40	0.04	6	26.4
Political Science Faculty Room	4	40	0.04	6	21.12
MA Class Room	3	40	0.04	6	15.84
Room No. 9	2	40	0.04	6	10.56
Room No. 10	2	40	0.04	6	10.56
Department of Assamese	6	40	0.04	6	31.68
MA Library	2	40	0.04	6	10.56
Office of IQAC	4	40	0.04	6	21.12
Assamese Store Room	1	40	0.04	6	5.28
Examination Control Room	8	40	0.04	6	42.24
Department of Philosophy	5	40	0.04	6	26.4
Room No. 6	5	40	0.04	6	26.4
Room No. 4	7	40	0.04	6	36.96
Girls Common Room	13	40	0.04	6	68.64
Room No. 4	7	40	0.04	6	36.96
Women's Cell	3	40	0.04	6	15.84
Room No. 2	5	40	0.04	6	26.4
Room No. 1	7	40	0.04	6	36.96
Room No. 3	5	40	0.04	6	26.4
Sports Complex cum Indoor Stadium	3	40	0.04	6	15.84
Health Centre	2	40	0.04	6	10.56
Krishna Kanta Handiqui State Open University Centre	3	40	0.04	6	15.84
National Service Scheme Room	1	40	0.04	6	5.28
Alumini Room	1	40	0.04	6	5.28
Library	50	40	0.04	6	264
Computer Science Faculty Room	4	40	0.04	6	21.12
Computer Lab	6	40	0.04	6	31.68
Computer Class Room 1	5	40	0.04	6	26.4
Computer Class Room 2	5	40	0.04	6	26.4
South Kamrup Students' Union	1	40	0.04	6	5.28
Warden's Quarter	5	40	0.04	6	26.4
Women's Hostel	50	40	0.04	6	264
Boys' Hostel	30	40	0.04	6	158.4

National Cadet Corps Room	1	40	0.04	6	5.28
Total Energy usage per month (kWh)					3226.08

Energy usage of Tube Light in the college

Department/ area	Number of Tube Lights	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Head Assistant Room	1	40	0.04	6	5.28
Office	4	40	0.04	6	21.12
Conference Room	72	40	0.04	6	380.16
The Digitage Hall	24	40	0.04	6	126.72
Department of History	1	40	0.04	6	5.28
D. K. College Canteen	1	40	0.04	6	5.28
Chemistry Store Room	4	40	0.04	6	21.12
Chemistry Lab 1	6	40	0.04	6	31.68
Education Faculty Room	4	40	0.04	6	21.12
Education Lab	2	40	0.04	6	10.56
Gymnasium	6	40	0.04	6	31.68
MA Library	3	40	0.04	6	15.84
Girls Common Room	4	40	0.04	6	21.12
Women's Cell	3	40	0.04	6	15.84
Library	6	40	0.04	6	31.68
Boys' Hostel	64	40	0.04	6	337.92
Computer Lab	3	40	0.04	6	15.84
Total Energy usage per month (kWh)					1098.24

Electrical Equipment and their energy consumption

Department	Name of the appliance/ equipment	Number of appliance/ equipment	Power consumed (watts)	Power in (kW)	Working time (hours per Day)	Energy Usage per month (kWh)
Chemistry	Polari meter	1	150	0.15	1	3.30
	Magnetic Stirrer	1	600	0.6	1	13.20

	Conductivity Meter	1	5	0.005	1	0.11
	Digital Balance	1	5	0.005	1	0.11
	Digital pH Meter	1	5	0.005	1	0.11
	Digital Auto Melting Point Apparatus	1	120	0.12	1	2.64
	Hot Air Oven	1	2200	2.2	1	48.40
	Photo calorimeter	1	1	0.001	1	0.022
	Rotatory Flask Shaker	1	250	0.25	1	5.50
Botany	Hot Air Oven	2	2200	2.2	1	96.80
	Autoclave	1	2200	2.2	1	48.40
	Centrifuge	1	1500	1.5	1	33.00
	Spectro-Photometer	1	250	0.25	1	5.50
	Hot Water Bath	1	1000	1	1	22.00
	Electrical Microscope	1	5	0.005	1	0.11
	Refrigerator	1	250	0.25	24	132.00
	Deep freezer	1	250	0.25	24	132.00
	Digital Balance	1	5	0.005	1	0.11
Zoology	Electrical Microscope	9	5	0.005	1	0.99
	Refrigerator	1	250	0.25	24	132.00
	Aquarium	2	15	0.015	24	15.84
Physics	Sodium lamp transformer	5	35	0.035	1	3.85
	Sodium Lamp	5	60	0.06	1	6.60
	Digital Balance	1	5	0.005	1	0.11
	CRO	3	33	0.033	1	2.178
	Refrigerator	1	200	0.2	24	105.60
Total Energy usage per month (kWh)						810.48

Energy usage of Computers in the College

Department	Number of Computers	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Office	7	200	0.2	1	30.80
Principal Room	1	200	0.2	1	4.40
Center for Media Study	2	200	0.2	1	8.80
The Digitage Hall	2	200	0.2	1	8.80
Department of Geography	9	200	0.2	1	39.60
Physics Electronics, Electricity, Computer Lab	7	200	0.2	1	30.80
Physics Material Research Lab	1	200	0.2	1	4.40

Zoology Faculty Room	1	200	0.2	1	4.40
Botany Faculty Room	1	200	0.2	1	4.40
Mathematics Computer Lab	3	200	0.2	1	13.20
Mathematics Faculty Room	1	200	0.2	1	4.40
Computer & Bio-Information Lab	18	200	0.2	6	475.20
Economics Faculty Room	1	200	0.2	1	4.40
B. VOC Computer Lab	15	200	0.2	1	66.00
Political Science Faculty Room	1	200	0.2	1	4.40
Department of Assamese	1	200	0.2	1	4.40
MA Library	1	200	0.2	1	4.40
Department of Philosophy	1	200	0.2	1	4.40
Krishna Kanta Handiqui State Open University Centre	1	200	0.2	1	4.40
Library	23	200	0.2	1	101.20
Computer Lab	30	200	0.2	4	528.00
Total Energy usage per month (kWh)					1350.80

Energy usage of Photocopiers in the College

Department	Number of Photocopier	Power consumed (watts)	Power in (kW)	Working time (hours per Day)	Energy Usage per month (kWh)
Dakshin Kamrup College Office	1	1000	1	4	88.00
Total Energy usage per month (kWh)					88.00

Energy usage of 10 KVA UPS in the College

Department	Number of 10 KVA UPS	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Dakshin Kamrup College	2	10000	10	1	440.00
Total Energy usage per month (kWh)					440.00

Energy usage of LCD Monitors in the College

Department/area	Number of appliance	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)

Dakshin Kamrup College	4	100	0.1	6	52.80
Total Energy usage per month (kWh)					52.80

Energy usage of Amplifiers, CCTV, Printers, Projectors, Exhaust Fans, Halogen Lights and Water Pumps in the College

Name of appliance/ equipment	Number of appliance/ equipment	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Amplifier	4	250	0.25	1	22.00
CCTV	10	35	0.035	24	184.80
Printers	14	250	0.25	0.25	19.25
Projectors	12	300	0.3	0.25	19.80
Exhaust Fans	28	80	0.08	3	147.84
Halogen Lights	8	72	0.072	3	38.02
Water Pumps	3	750	0.75	0.25	12.38
Total Energy usage per month (kWh)					444.08

Energy usage of Air Conditioners in the College

Department/area	Number of AC	Power Consumed (watts)	Power in (kW)	Working Time (hours per Day)	Energy Usage per month (kWh)
Teachers' Common Room	3	1500	1.5	1	99.00
Principal Room	3	1500	1.5	1	99.00
Conference Room	4	1500	1.5	1	132.00
The Digitage Hall	4	1500	1.5	1	132.00
Department of Geography	1	1500	1.5	1	33.00
Physics Electronics, Electricity, Computer Lab	2	1500	1.5	1	66.00
Physics Dark Room 2	1	1500	1.5	1	33.00
Theory cum Practical Lab 2	1	1500	1.5	1	33.00
B. VOC Computer Lab	2	1500	1.5	1	66.00
Computer Lab	5	1500	1.5	1	165.00
Total Energy usage per month (kWh)					858.00

4.1.3 WASTE

The total strength of students, teachers and Non-teaching staff in the College

	No. of Students	No. of Teachers No.	Non-teaching staff
Gents	2103	48	44
Ladies	2358	53	9
Total	4461	101	53

The following are the area where waste is generated in the College

Garden area	7
Playground area	1
Laboratory	20
Kitchen	2
Canteen	1
Toilets	68
Car/scooter parking area	2
Number of class rooms	60
Office rooms	4

The following are the area found near the college

Mark the level of disturbance it creates for the college in a scale of 1 to 9.

Source	Scale
Municipal dump yard	1
Garbage heap	1
Public convenience	2
Sewer line	1
Stagnant water	1
Open drainage	1
Industry	1
Bus station	2
Shopping complex/public halls	3

The college generate waste of following type:

Type	Amount
Bio-degradable	Dry leaves 10 kg/day Canteen/ kitchen waste 40 kg/day Office 0.25 kg/day
Non-Bio-degradable	0.1 kg/day
Hazardous waste	0.05 kg/ day
Sanitary Napkin	One incineration unit is installed in girls' common room.

The approximate quantity of waste generated per day (in Kilograms)

Office

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.	0.25 kg	0.05 kg	Nil	Nil

Laboratories

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.	Nil	0.05 kg	0.05 kg	Nil

Canteen/kitchen

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
2 - 10 kg	40 kg	Nil	Nil	Nil

The waste generated in the college managed will be managed following methods

- Composting
- Recycling
- Reusing

Four separate buckets will be put in front of a classroom to start a waste segregation and recycling campaign.

- **Blue bucket** for Paper and Glass waste
- **Green bucket** for Food waste

- Paper waste generated in the college is sold to paper waste collector of the area.
- The college management is working very hard to achieve zero garbage in the campus college following 4R principle Reduce, Recycle, Reuse and Refuse.

CONTAINERS FOR HAZARDOUS (CHEMICAL) WASTE

Environmental Health and Safety Office (EHS) provides the following containers for chemical waste collection, activities requiring special containers are evaluated on a case-by-case basis.

NEVER FILL CONTAINERS TO THE TOP!

- Leave about 2-inches for safe handling and to prevent overflows or spills when handled.
- All waste must reside in closed, non-leaking containers.
- The outside of the waste container must be reasonably clean.

- NEVER use flasks or test tubes with stoppers, beakers with Para film, or bottles with ground glass stoppers.
- NEVER put liquids in containers designed for solids -- they leak!
- NEVER write directly on gallon bottle!

  These containers are cleaned and redistributed to other users. Use painters tape (or similar) if you need to attach labels.

  All chemical waste containers must remain CLOSED (capped) except when waste is being added—this is a regulatory requirement. Additionally, when chemical waste containers are left uncapped, laboratory personnel are at the risk of chemical exposure due to inhalation of chemical vapours.

  It is very important that the waste container is made of a material that is compatible with the waste to be put in it. Do not put acidic or basic waste (pH <3 or >9) in metal cans. Metal cans corrode in a very short time.

  These containers are provided by EHS for regular use.

Plastic Bottle, 4-liter (~1 gallon)

Plastic Bucket, 1-gallon

Buckets are used for solid and gel waste (including ethidium bromide contaminated gels).

LABELLING AND MARKING OF HAZARDOUS (CHEMICAL) WASTE CONTAINERS

The containers of hazardous waste to be labelled with the words "Hazardous Waste" and a description of the contents of the container. The example below shows proper labelling for a flammable solution.

HAZARDOUS WASTE STICKER

In addition to waste stickers, all waste containers MUST have a Waste Disposal Ticket (see image below), affixed to it prior to pick up. This label is issued by EHS Office. This includes chemicals still in their original containers. Waste will not be picked up if it is not labelled properly.

Waste Disposal Tickets must be filled out completely. This includes:

- Date, Lab In-charge, Department, Name of the person filling out the label, Building, Room Number, Phone Number.
- The names of all the constituent contents of the container. Do not use abbreviations, chemical formulas or chemical diagrams.
- The corresponding percentages of these constituents.
- The total quantity of material in the container.
- pH (for liquids)

IMPORTANT: Disposal companies will not accept unknown chemicals. You must make every possible effort to accurately describe the contents of each container. This means tracking down and questioning previous lab occupants if necessary.

WASTE DISPOSAL TICKET

ENVIRONMENTAL HEALTH AND SAFETY OFFICE
CHEMICAL SAFETY DIVISION
WASTE CHEMICAL/ BIOHAZARD
IDENTIFICATION FORM

DATE:

Lab In-charge: _____

Building: _____

Department: _____

Room No.: _____

User Name: _____

Phone No.: _____

Waste Information: Please fill out one form (with its copy) for each container of waste. List all contents- including water. Indicate each component's percentage in the mixture (if unknown, approximate). Use proper chemical names. DO NOT USE CHEMICAL FORMULAS, STRUCTURES, or uncommon abbreviations. Please print. DO NOT WRITE IN SHADED AREA.

Waste Contents (Chemical Name)	Percentage (%)

TOTAL PERCENTAGE (%) MUST EQUAL 100%

Total quantity in this container: _____

pH: _____ ☐ Liquid ☐ Solid

SEGREGATION GUIDELINES FOR HAZARDOUS (CHEMICAL) WASTE

In order to minimize the chances of incompatible materials being mixed together and to keep disposal costs for the College as low as possible, keep certain types of chemicals separated at the time of collection. When combining different materials, always check the Safety Data Sheet to be sure they are compatible materials.

Keep the following groups in separate containers whenever possible and use the associated Globally Harmonized System of Classification and Labelling of Chemicals (GHS) pictogram to identify the hazard on the waste label when applicable.

MAJOR HAZARD	Separate Waste Groups (collect in separate containers)
FLAMMABLE 	-Non-halogenated organic solvents, <5% water -Non-halogenated organic solvents, >5% water
TOXIC	-Halogenated solvents (% water unimportant) -Cyanides -Formaldehyde Solutions -Solutions containing compounds of the following metals: **arsenic,**

	**barium, cadmium, chromium, lead, silver and selenium**. -Any solution containing **mercury** or its compounds. (Mercury and mercury compounds **should be kept separate** from any liquid whenever possible.)
CORROSIVE 	-Acids, organic -Acids, mineral -Bases, organic -Bases, mineral -Photographic stop bath -**Note**: Do not put acidic or basic waste (ph <3 or >9) in metal cans. Metal cans corrode in a very short time. Keep acids and bases separate from hydrocarbons and ethers.
OXIDIZING 	-Inorganic oxidizers -Organic peroxides
AEROSAL CANS 	-All aerosol cans
MISCELLANEOUS WASTE SEGREGATION	-Photographic fixer -Photographic developer -When possible, keep carcinogens, mutagens, and teratogens separate from other wastes -Keep aqueous wastes separate from organic solvents -Keep halogenated and non-halogenated wastes separate -Sulfides -Pesticides -Paints -Oils -**Lamps/Bulbs** - Fluorescent lamps and high intensity discharge bulbs contain mercury and must be recycled. Facilities Management should handle any bulbs from the lighting systems of buildings as part of general maintenance. Smaller bulbs from laboratory equipment can be given to EHS for disposal. -**Batteries** - EHS will take lithium batteries, and damaged/defective batteries. **Recycling** accepts lithium, lithium ion, lithium

	rechargeables, lead acid, alkaline, nickel cadmium, nickel metal hydride, 9 volts, and button batteries. -**All sharps (Needles, razor blades, scalpel blades, etc.)**, whether they are contaminated with trace chemicals or uncontaminated, must be placed in a sharps container.

BROKEN GLASSWARE, WASTE LABORATORY GLASSWARE (WLG)

If they DO NOT contain or ARE NOT contaminated with Radioactive Material (any amount), Chemicals (more than a trace amount) or Biohazardous Material (any amount), then these waste materials are **Waste Laboratory Glassware (WLG)**.

Waste Laboratory Glassware:

- Place into any ordinary cardboard box lined with a regular trash bag.
- Once full, close the bag by tying or taping the bag closed then tape box closed using packing tape (other types of tape do not keep the box securely closed during handling).
- Apply a WLG label (see photo below) to the box top.
- These waste materials will be treated as regular trash and should be carried directly to the trash receptacle or dumpster outside of your building.

EMPTY CONTAINERS

Empty Container Disposal: EHS does not pick up empty chemical reagent bottles. Triple rinse empty chemical bottles, collect the rinsate as waste, deface the chemical label, and then discard bottles in the trash or reuse for waste collection (labelled appropriately).

4.1.4 GREEN CAMPUS

Total number of tree species identified – 32

Total number of fruit tree species identified – 10

Total number of Medicinal plant species identified– 7

Garden area and tree cover of the campus - 124.02 m^2

Free space in the campus – 21.78 m^2

The plant species present in the campus is listed in the Table below:

Campus Trees

Sl. No.	Name of the plant species	Family	Common name	Number of plants
1.	*Tectona grandis* L. f	Verbenaceae	Segun	72
2.	*Mesua ferrea* L.	Clusiaceae	Nahor	18
3.	*Terminalia cuneata* Roth (=*T. arjuna* Roxb.)	Combretaceae	Arjun	3
4.	*Terminalia chebula* Retz.	Combretaceae	Xilikha	5
5.	*Azadirachta indica indica* A. Juss.	Meliaceae	Mahaneem	15
6.	*Melia azedarach* L.	Meliaceae	Ghoraneem	13
7.	*Albizia lucidior* (Steud.) Nielson ex Hara	Mimosaceae	Moj	4
8.	*Samanea saman* (Jacq.) Merr.	Mimosaceae	Siris	3
9.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Jaam	2
10.	*Psidium guajava* L.	Myrtaceae	Madhuriaam	3
11.	*Delonix regia* (Bojer.) Raf.	Caesalpiniaceae	Krishnasura	2
12.	*Cocos nucifera* L.	Arecaceae	Narikol	2
13.	*Dypsis lutescens* (H. Wendl)	Arecaceae	Momai Tamol	48
14.	*Michelia champaca* L.	Magnoliaceae	Titasopa	4
15.	*Dalbergia sissoo* Roxb. Ex. DC.	Fabaceae	Sisoo	4
16.	*Butea monosperma* (Lamk) Taub.	Fabaceae	Palas	3
17.	*Aegle marmelos* (L.) Corr.	Rutaceae	Bael	2
18.	*Polyalthia longifolia* (Sonner.) Thw.var. *Longifolia*	Annonaceae	Devadaru	4
19.	*Polyalthia longifolia* (Sonner.) Thw.var. *pendula* (Sonner.) Thw	Annonaceae	Devadaru	8
20.	*Pinus kesiya* Royle. Ex Gordon.	Pinaceae	Saralgos	2
21.	*Magnolia hodgsonii* (Hookf & Th.) Keng	Magnoliaceae		2
22.	*Mimusops elengi* Roxb.	Sapotaceae	Bokul	14
23.	*Aquilaria malaccensis* Lam.	Thymelaeaceae		2
24.	*Machilus bombycina* King. Ex. Hook.f	Lauraceae	Som	2
25.	*Ficus religiosa* Linn.	Moraceae	Aahot	3
26.	*Artocarpus heterophyllus* Lam.	Moraceae	Kathal	6
27.	*Spondias pinnata*	Anacardiaceae	Amora	1
28.	*Areca catechu* L.	Arecaceae	Tamul	2
29.	*Averrhoa carambola* L.	Oxalidaceae	Kordoi	1
30.	*Phyllanthus emblica*	Phyllanthaceae	Aamlokhi	4
31.	*Musa paradisiaca*	Musaceae	Kach kol	5
32.	*Ziziphus mauritiana* Lam.	Rhamnaceae	Bogori	2

Source: Data given by Department of Botany

Fruit Trees

Sl. No.	Name of the plant species	Family	Common name	Number of plants
1.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Jaam	2
2.	*Psidium guajava* L.	Myrtaceae	Madhuriaam	3
3.	*Cocos nucifera* L.	Arecaceae	Narikol	2
4.	*Aegle marmelos* (L.) Corr.	Rutaceae	Bael	2
5.	*Artocarpus heterophyllus* Lam.	Moraceae	Kathal	6
6.	*Spondias pinnata*	Anacardiaceae	Amora	1
7.	*Averrhoa carambola* L.	Oxalidaceae	Kordoi	1
8.	*Phyllanthus emblica*	Phyllanthaceae	Aamlokhi	4
9.	*Musa paradisiaca*	Musaceae	Kach kol	5
10.	*Ziziphus mauritiana* Lam.	Rhamnaceae	Bogori	2

Source: Data given by Department of Botany

Medicinal Plants

Sl. No.	Name of the plant species	Family	Common name	Number of plants
1.	*Murraya koenigii* (L.) Spreng	Rutaceae	Norosingho	2
2.	*Costus speciosus* (Koen.ex Retz.) Sm.	Costaceae	Jomlakhuti	4
3.	*Kalanchoe pinnata* (Roxb.) Pers.	Crassulaceae	Duportenga	16
4.	*Bryophyllum pinnatum* Roxb.	Crassulaceae	Pategoja	8
5.	*Rauvolfia tetraphylla* L.	Apocynaceae	Sarpogondha	4
6.	*Asparagus racemosus* Willd.	Liliaceae	Sotmul	4
7.	*Citrus Limon* L. Burmf	Rutaceae	Nemu	3

Source: Data given by Department of Botany

Campus Beautification Plants

Sl. No.	Name of the plant species	Family	Common name	Number of plants
1.	*Duranta repens*	Verbenaceae	Duranta	52
2.	*Platycladus orientalis* (L.) Franco (=*Thuja orientalis* L.)	Cupressaceae	Thuja	10
3.	*Murraya paniculata* (L.) Jack	Rutaceae	Kaminikanchan	8
4.	*Mussaenda sp.*	Rubiaceae	Masunda	18
5.	*Ixora coccinea* L.	Rubiaceae	Rongial	10
6.	*Alternanthera brasiliana* (L.) Kuntze	Amaranthaceae	Bishalya Karani	52
7.	*Tradescantia spathacea* Sw.	Commelinaceae	Boat Lily	40
8.	*Zephyranthes candida* (Lindl.) Herb	Amaryllidaceae	Lily	34
9.	*Nyctanthes arbor-tristis* L.	Oleaceae	Sewali	2
10.	*Euphorbia ligularia* Roxb.	Euphorbiaceae	Siju	4
11.	*Canna indica* L.	Cannaceae	Parijat	7
12.	*Catharanthus roseus* (L.) G. Don.	Apocynaceae	Nayantara	12
13.	*Jasminum sambac*	Oleaceae	Tagar	1
14.	*Cascabela thevetia*	Apocynaceae	Korobi	2
15.	*Cycas rumphii*	Cycad		5

Source: Data given by Department of Botany

Orchids in Green House

SL. No.	Name	Family
1	*Papilionanthe teres*	Orchidaceae
2	*Dendrobium aphyllum*	Orchidaceae
3	*Rhyncostylis retusa*	Orchidaceae
4	*Arundina graminifolia*	Orchidaceae
5	*Vanilla planifolia*	Orchidaceae
6	*Dendrobium species*	Orchidaceae
7	*Cymbidium species*	Orchidaceae
8	*Bulbophyllum species*	Orchidaceae
9	*Aerides multiflora*	Orchidaceae
10	*Phaius species*	Orchidaceae

Source: Data given by Department of Biotechnology (Biotech Hub)

List of plants for "Tree Plantation Programme" in college campus

Sl. No.	Botanical name	Family	Local name
1	*Abelmoschus manihot*	Malvaceae	Usipak
2	*Abelmoschus moschatus*	Malvaceae	Gorokhia koroi
3	*Abroma augusta*	Sterculiaceae	Gorokhia koroi
4	*Abrus precatorius*	Papilionaceae	Latumoni
5	*Abutilon indicum*	Malvaceae	Pera petari
6	*Acacia catechu*	Mimosaceae	Khair
7	*Achyranthes aspera*	Amaranthaceae	Hatisur
8	*Acarus calamus*	Araceae	Bach
9	*Actinodaphne angustifolia*	Lauraceae	Petarichawa
10	*Aegle marmelos*	Rutaceae	Bel
11	*Ajuga bracteosa*	Lamiaceae	Nilakantha
12	*Allium sativum*	Liliaceae	Naharu
13	*Alocasia macrorrhiza*	Araceae	Boro mankachu
14	*Aloe barbadensis*	Liliaceae	Sal konwari
15	*Alstonia scholaris*	Apocynaceae	Satiana
16	*Alternanthera sessilis*	Amaranthaceae	Mati-kanduri
17	*Altingia excelsa*	Altingiaceae	Jutuli
18	*Amaranthus spinosus*	Amaranthaceae	Khutura
19	*Andrographis paniculata*	Acanthaceae	Sirata
20	*Anthocephalus cadamba*	Rubiaceae	Kadom
21	*Antidesma accuminatum*	Euphorbiaceae	Bor-heloch
22	*Antidesma diandrum*	Euphorbiaceae	Abutenga
23	*Antidesma ghaesembilla*	Euphorbiaceae	Heloch
24	*Aquilaria malacensis*	Thymelaeaceae	Agaru, Sasi-goss
25	*Areca catechu*	Arecaceae	Tamul
26	*Argemone maxicana*	Papaveraceae	Kuhum kata
27	*Aristolochia tagala*	Aristolochiaceae	Belikol, chohu
28	*Asparagus racemosa*	Liliaceae	Satmul
29	*Azadirachta indica*	Meliaceae	Mahanim

30	*Azanza lampas*	Malvaceae	Bon kapah
31	*Baccaurea ramiflora*	Euphorbiaceae	Leteku
32	*Bacopa monnieri*	Scrophulariaceae	Brahmi
33	*Belamcanda chinensis*	Iridaceae	Surjakanti
34	*Blechnum orientale*	Blechnaceae	Dhekia
35	*Boerhavia diffusa*	Nyctaginaceae	Ponownua
36	*Bombax ceiba*	Bombacaceae	Simalu
37	*Brassica juncea*	Brassicaceae	Lai
38	*Butea monosperma*	Fabaceae	Palas
39	*Byttneria grandiflora*	Sterculiaceae	Tikani barua
40	*Calotropis gigantea*	Asclepiadaceae	Akan
41	*Calotropis procera*	Asclepiadaceae	Akan
42	*Camellia chinensis*	Theaceae	Sah goss (Tea plant)
43	*Cardiospermum helicacabum*	Sapindaceae	Kapalphuta
44	*Carallia brachiata*	Rhizophoraceae	Kanthekera
45	*Cassia alata*	Caesalpiniaceae	Khor goss
46	*Cassia fistula*	Caesalpiniaceae	Sunaru
47	*Catharanthus roseus*	Apocynaceae	Nayantara
48	*Cayratia carnosa*	Vitaceae	Ghepeta lota
49	*Cedrela toona*	Meliaceae	Poma
50	*Centella asiatica*	Apiaceae	Manimuni
51	*Chenopodium album*	Chenopodiaceae	Jilmil sak
52	*Cinnamomum tamala*	Lauraceae	Tejpat
53	*Cinnamomum obtusifolium*	Lauraceae	Patihonda, patichanda
54	*Chukrasia tubularis*	Meliaceae	Boga poma
55	*Cissus rependa*	Vitaceae	Medmedia lota
56	*Clerodendrum colebrookianum*	Verbinaceae	Nephaphu
57	*Clerodendrum indicum*	Verbinaceae	Dhaptita
58	*Clerodendrum infortunatum*	Verbinaceae	Dhapatita
59	*Clitoria ternatea*	Fabaceae	Aparajita
60	*Coriandrum sativum*	Apiaceae	Dhania
61	*Costus speciosus*	Zingiberaceae	Jomlakhuti
62	*Crotalaria albida*	Fabaccae	Ban-methi
63	*Croton caudatus*	Euphorbiaceae	Lata-mahudi
64	*Croton joufra*	Euphorbiaceae	Mahudi
65	*Croton tighlium*	Euphorbiaceae	Koni bih
66	*Curcuma amada*	Zingiberaceae	Amada
67	*Curcuma aromatica*	Zingiberaceae	Ban-haladhi
68	*Curcuma caesia*	Zingiberaceae	Kola-haladhi
69	*Curcuma domestica*	Zingiberaceae	Haladhi
70	*Curcuma longa*	Zingiberaceae	Haladhi
71	*Cuscuta reflexa*	Convolvulaceae	Akashi-lota
72	*Cymbopogon flexuosus*	Poaceae	Lemon grass
73	*Datura fastuosa*	Solanaceae	Dhatura
74	*Datura stramonium*	Solanaceae	Kola-dhatura

75	*Deeringia amaranthoides*	Amaranthaceae	Rangoli lota
76	*Dillenia indica*	Dilleniaceae	Outenga
77	*Dillenia pentagyna*	Dilleniaceae	Akshi
78	*Dillenia scabrella*	Dilleniaceae	Banji-ou
79	*Dioscorea alata*	Dioscoreaceae	Kathalu
80	*Dioscorea bulbifera*	Dioscoreaceae	Kathalu
81	*Dischidia rafflesiana*	Asclepiadaceae	Honkha ojhar mana
82	*Dregea volubilis*	Asclepiadaceae	Khomal Iota
83	*Eclipta alba*	Asteraceae	Kenharaj
84	*Elaeocarpus sphaericus*	Elaeocarpaceae	Ridra rudrakhya
85	*Elsholtzia blanda*	Lamiaceae	Bon-tulasi
86	*Emblica officinalis*	Euphorbiaceae	Amlakhi
87	*Engelhardita spicata*	Juglandaceae	Lewa Lal-amiri
88	*Enhydra fluctuans*	Asteraceae	Helochi
89	*Entada phaseoloides*	Mimosaceae	Gila-lewa
90	*Erioglossum rubiginosum*	Sapindaceae	Abigran
91	*Eryngium foetidum*	Apiaceae	Jongoli-memedhu
92	*Erythrina stricta*	Fabaceae	Madar
93	*Eugenia jambolana*	Myrtaceae	Loha-jam
94	*Eugenia kurzii*	Myrtaceae	Bogijamuk
95	*Eupatorium cannabinum*	Asteraceae	Tong-loti
96	*Eupatorium odoratum*	Asteraceae	Jarmoni ban
97	*Euphorbia neriifolia*	Euphorbiaceae	Hiju
98	*Eurya japonica*	Theaceae	Saseni, murmura
99	*Euryale ferox*	Nymphaeaceae	Makhana
100	*Ficus bengalensis*	Moraceae	Bor goss
101	*Ficus benjamina*	Moraceae	Chilubor goss
102	*Garcinia cowa*	Clusiaccae	Kujithekera
103	*Garcinia morella*	Clusiaceae	Kujithekera
104	*Garcinia pedunculata*	Clusiaceae	Bor-thekera
105	*Gardenia campanulata*	Rubuaceae	Bitmara, bhi-mona
106	*Gmelina arborea*	Verbenaceae	Gomari
107	*Gloriosa superba*	Liliaceae	Agnisikha
108	*Glycosmis pentaphylla*	Rutaceae	Hengena poka
109	*Gnetum montanum*	Gnetaceae	Mameilet
110	*Grewia hirsuta*	Tiliaceae	Sukta-pata
111	*Gynocardia odorata*	Flacourtiaceae	Lamtem
112	*Hedychium spicatum*	Zingeberaceae	Karpur
113	*Hedyotis scandens*	Rubiaceae	Bhedeli -lota
114	*Hibiscus rosa-sinensis*	Malvaceae	Joba
115	*Hiptage benghalensis*	Malpighiaceae	Kerek-Iota
116	*Holarrhena antidysenterica*	Apocynaceae	Dudkhuri, kutuj
117	*Homonoia riparia*	Euphorbiaceae	Hil-kadam
118	*Horsfieldia kingii*	Myrsticaceae	Amol
119	*Hovenia dulcis*	Rhamnaceae	Chetia-bola

120	*Hydnocarpus kurzii*	Flacourtiaceae	Chalmugra, lamtem
121	*Hymenodictyon excelsum*	Rubiaceae	Kodam
122	*Ichnocarpus frutescens*	Apocynaceae	Lomakandol
123	*Impatiens tripetala*	Balsaminaceae	Koria bijol, dumdeuka
124	*Ipomea batats*	Convolvulaceae	Mitha-alu
125	*Ipomea eriocarpa*	Convolvulaceae	Kalmow
126	*Ixora coccinea*	Rubiaceae	Rangol
127	*Jatropha curcas*	Euphorbiaceae	Bongali bhotera
128	*Jatropha gossypifolia*	Euphorbiaceae	Bhotera
129	*Juglans regia*	Juglandaceae	Akhrot
130	*Justicia gendarussa*	Acanthaceae	Tita-bahek
131	*Kayea assamica*	Clusiaceae	Sia-nahar
132	*Kirganelia reticulata*	Euphorbiaceae	Amloki
133	*Knema angustifolia*	Myrtaceae	Mota-pasuti, tezranga
134	*Lagenaria siceraria*	Cucurbitaceae	Jati-lau, lau
135	*Lagerstroemia speciosa*	Lythraceae	Azar
136	*Laportea crenulata*	Urticaceae	Sorat goss
137	*Lawsonia inermis*	Lythraceae	Jetuka, mehendi
138	*Leea indica*	Vitaceae	Kukurathengia
139	*Leucas linifolia*	Lamiaceae	Doron bon
140	*Linostoma decandrum*	Thymelaeaceae	Bakalbih, ruteng
141	*Lithocarpus fenestratus*	Fagaceae	Kuhi
142	*Litsea glutinosa*	Lauraceae	Heluka, bagnala
143	*Litsea monopetala*	Lauraceae	Hoanlu
144	*Litsea salicifolia*	Lauraceae	Dighloti
145	*Macrosolen cochinchinensis*	Loranthaceae	Raghumola
146	*Maesa indica*	Myrsinaceae	Awuapat, maahpora
147	*Mallotus philippensis*	Euphorbiaceae	Jorat, losan
148	*Mangifera sylvatica*	Anacardiaceae	Bon-am
149	*Manihot esculenta*	Euphorbiaceae	Simalu-alu
150	*Melastoma malabathricum*	Melastomataceae	Phutuka
151	*Melia azedarach*	Meliaceae	Ghora-nim
152	*Merremia umbellata*	Convolvulaceae	Goria loti, kolia lata
153	*Mesua ferrea*	Clusiaceae	Nahor
154	*Meyna laxiflora*	Rubiaceae	Kutkura, moin
155	*Mezoneuron cucullatum*	Caesalpiniaceae	Bagh-anchora
156	*Michelia champaca*	Magnoliaceae	Titasopa
157	*Michelia Montana*	Magnoliaceae	Pansopa
158	*Microtoena insuavis*	Lamiaceae	Asomia patchouli
159	*Millettia pachycarpa*	Fabaceae	Bokol bih
160	*Mimosa pudica*	Mimosaceae	Nilajiban
161	*Mimusops elengi*	Sapotaceae	Bokul, gokul
162	*Mirabilis jalapa*	Nyctaginaceae	Gadhuli -gopal
163	*Mitragyna rotundifolia*	Rubiaceae	Timi
164	*Momordica dioica*	Cucurbitaceae	Bhatkarela

165	*Moringa oleifera*	Moringaceae	Sajina
166	*Morus alba*	Moraceae	Nuni goss
167	*Mucuna prurita*	Fabaceae	Bandar kekua
168	*Murraya koenigii*	Rutaceae	Narasingha
169	*Mussaenda glabra*	Rubiaceae	Sonarupa
170	*Myrica esculenta*	Myricaceae	Nagatenga
171	*Nelumbo nucifera*	Nymphaeaceae	Podum
172	*Nerium indicum*	Apocynaceae	Karabi
173	*Nyctanthus arbor-tristis*	Oleaceae	Sewali phul
174	*Nymphaea alba*	Nymphaeaceae	Bhet, kumud
175	*Nymphaea stellata*	Nymphaeaceae	Neel-padma
176	*Ocimum basilicum*	Lamiaceae	Tulasi
177	*Ocimum gratissimum*	Lamiaceae	Ram-tulasi
178	*Ocimum sanctum*	Lamiaceae	Kola-tulasi
179	*Oroxylum indicum*	Bignoniaceae	Bhatghila
180	*Osbekia nepalensis*	Melastomataceae	Boga-phutuka
181	*Oxalis corniculata*	Oxalidaceae	Tengeshi-tenga
182	*Paederia foetida*	Rubiaceae	Bhedeli-lota
183	*Phlogocanthus thyrsiflorus*	Acanthaceae	Tita-phul
184	*Phylanthus fraternus*	Euphorbiaceae	Bhui-amlakhi
185	*Phyllanthuis urinaria*	Euphorbiaceae	Bhui-amlakhi
186	*Phytolacca acinosa*	Phytolaccaceae	Jaiong
187	*Picrasma javanica*	Simaroubaceae	Bon-posala, nimita
188	*Piper betle*	Piperaceae	Pan
189	*Piper longum*	Piperaceae	Pipoli
190	*Piper nigram*	Piperaceae	Jaluk
191	*Pithecellobium clypearia*	Mimosaceae	Bhasahu
192	*Pithecellobium monadelphum*	Mimosaceae	Moj, Bhasahu
193	*Plumbago indica*	Plumbaginaceae	Ronga-agechi
194	*Plumbago zeylenica*	Plumbaginaceae	Boga-agechi
195	*Plumeria acuminata*	Apocynaceae	Gulanchi,gulancha
196	*Pongamia pinnata*	Fabaceae	Karchaw
197	*Pothos cathcartii*	Araceae	Hathi dhekiya
198	*Rauvilfia serpentina*	Apocyanaceae	Arachontita
199	*Rubia cordifolia*	Rubiaceae	Majathi
200	*Schima wallichii*	Theaceae	Makriasal, nogabhe
201	*Setaria italica*	Poaceae	Kaon
202	*Sida acuta*	Malvaceae	Boriala
203	*Sida cordifolia*	Malvaceae	Sun-borial
204	*Sida rhombifolia*	Malvaceae	Boriala
205	*Solanum indicum*	Solanaceae	Tid bhakuri
206	*Solanum nigrum*	Solanaceae	Pichkati
207	*Solanum torvum*	Solanaceae	Bhit-tita, hathibhekuri
208	*Spilanthus acmella*	Asteraccae	Pirazha
209	*Spondias pinnata*	Anacardiaceae	Amora

210	*Stephania hernandifolia*	Menispermaceae	Tubuki-lot, goldua
211	*Symplocos racemosa*	Symplocaceae	Kavirang, bhomroti
212	*Syzygium cumini*	Myrtaceae	Kalajam
213	*Tamarindus indica*	Caesalpinaceae	Tetuli
214	*Tectona grandis*	Verbanaceae	Ching-jagu
215	*Tephrosia candida*	Fabaccae	Boga medaloa
216	*Terminalia arjuna*	Combretaceae	Arjun
217	*Terminalia chebula*	Combretaceae	Hilikha
218	*Terminalia myriocarpa*	Combretaceae	Hollock
219	*Typhonium trilobatum*	Araceae	Samakosu
220	*Vesica adhatoda*	Acanthaceae	Bahek
221	*Viburnum colebrookianum*	Caprifoliaceae	Mezenga
222	*Vitex negundo*	Verbenaceae	Posotia
223	*Wedelia calandulacea*	Asteraceae	Maha -bhringraj
224	*Wrightia tomentosa*	Apocynaceae	Atkuri
225	*Xanthium strumarium*	Asteraceae	Agara
226	*Xanthozylum budrunga*	Rutaceae	Bajramani, bajranali

Celebration of World Environment Day – June 5

Awareness seminars are organized on various environmental problems. Distribution of fruit trees, poster exhibition etc. are some activities on that day.

4.1.5 CARBON FOOTPRINT

Number of persons using cycles –280

Number of persons using cars – 12

Number of persons uses two wheelers – 36

Number of persons using other transportations – 650

Number of visitors per day – 10

Number of Students staying in the hostel – 130

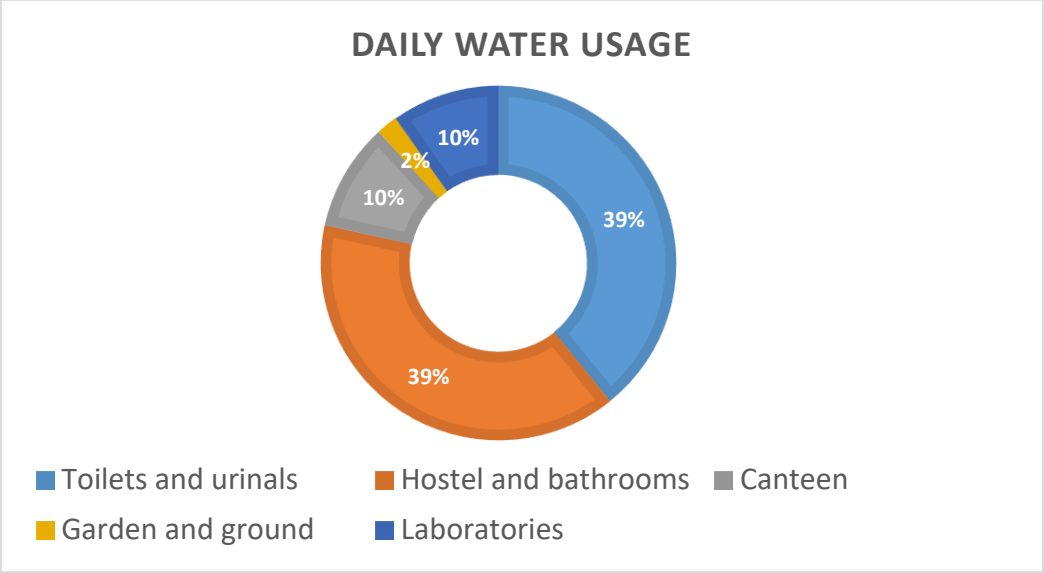
Number of Faculty staying in the quarters – 1

Average distance travelled by stake holders – 20x2 km/day

Expenditure for transportation per person per day – Rs.20/-

4.2 EVALUATION OF AUDIT FINDINGS

4.2.1 WATER



5100 litres of water is used per day by the college for its different uses. The main source of water is ground water. Water from the public water supply is not utilized. **No** water is lost per day through the leaking of pipes and other misuses.

Wastage of water can be prevented. If water treatment system is installed at canteen and chemical laboratories the amount of water lost through outlets can be recycled and utilized for gardening and toilet uses. Awareness programs for the management of sustainable water use will be highly beneficial in this college.

4.2.2 ENERGY

Energy Utilization

Appliances	Number of appliance	Units of current per month kWh
CFL bulbs	158	312.84
LED lights	609	803.88
Fans	611	3226.08
Tube lights	208	1098.24
Electrical Equipment	46	810.48
Computers	127	1350.80
Photocopiers	1	88.00
Inverters/UPS	2	440.00
Televisions/Monitors	4	52.80
Amplifier	4	22.00
CCTV	10	184.80
AC	26	858.00

Printers	14	19.25
Projectors	12	19.80
Exhaust Fans	28	147.84
Halogen Lights	8	38.02
Water Pumps	3	12.38
Total Energy usage per month (kWh)		9485.21

Current saving methods adopted in the college

- ✓ Turn off electrical equipment when not in use
- ✓ Use energy efficient light-emitting diode (LED) bulbs instead of incandescent and CFL bulbs
- ✓ Maintain appliances and replace old appliances.
- ✓ Use computers and electronic equipment in power saving mode.

The total energy utilization of the college for different purposes is estimated approximately **9500 units/month**. By using Solar Energy and energy saving methods, the college management cut down its energy utilization to approximately **9,200 units/month.** Energy Saving is about **300 units/month.** Increased production of solar energy a type of non-conventional category of energy will be a good energy management system for the college. Electricity charges per month are approximately **₹1,25,000/month**. Energy saving through the replacement of CFL lamps and tube lights to LED light could be a good option. Energy efficient electrical equipment especially fans and pump sets can be replaced against old ones. Awareness programs for the stakeholders to save energy may also increase sustainability in the utilization of various energy source.

4.2.3 WASTE

- ❖ Total Biodegradable waste = 50.25 kg/day
- ❖ Non-biodegradable waste = 0.1 kg/day
- ❖ Hazardous wastes = 0.05 kg/day

The composting facility of the college for the treatment of biodegradable waste generated from the canteen, office, vegetable garden, and from the college campus cleaning operations is not adequate. Different methods such as pit composting, vermi-composting, bacterial composting using bacterial consortium may be used to treat the biodegradable waste. Bottles, plastics, cans, broken glass wares, tins etc., may be sold out. A model solid waste treatment system can be established in the college as a part of awareness program to the students.

4.2.4 GREEN CAMPUS

Total number of plant species identified – 54

Tree cover of the campus –124.02 m^2

Total area for cultivation

The college has very less land surface for greening initiatives. The campus has **32** species of trees. Establishment of rooftop medicinal plants garden and vegetable garden may be encouraged in the college campus.

4.2.5 CARBON FOOTPRINT

- Petrol used by two wheelers/day–**36** litre (Per person to and fro 40 kms =1litre)
- Petrol used by four wheelers (12 Persons) - **24** litre (Per person to and fro 40 kms = 2 litre)
- Fuel for persons (total 650 persons) travelling by common transportation = **52** litre (4 litre x 50 persons)
- Total fossil fuel use is **112** litre / day.
- Total fuel cost per day for transportation **₹11,200/-** (112 litre x ₹100)
- Cost of Gas cylinders used **₹4000**/month (4 cylinders)
- Cost of generator fuel – **₹1000**/month (0.5 litre per day)
- Amount spent for transportation (office) – **₹500**/month (Approx.)
- Amount spent for transportation (canteen) – **₹500**/month (Approx.)
- Amount spent for transportation (visitors) – **₹15000**/year (Approx.)
- Other expenditures for the energy – **₹100**/day

Usage of fossil fuels is the main source and cause of carbon dioxide release in the atmosphere. Diesel engines produce 2.7 kg of CO_2 per litre of diesel fuel consumed. The CO_2 emissions from petrol is around 2.4 kg per litre. Transportation to the college campus by students/ faculties/ others is the main source of carbon dioxide pollution. To avoid the current situation a dedicated College bus for transportation can be implemented. This initiative will reduce the total vehicle load coming into the campus. Additionally, it is advisable to plant more trees in the campus to maintain the ecological balance and reduce pollution.

4.3 LIST OF ECO-FRIENDLY ACTIVITIES GOING ON IN THE CAMPUS

- ✓ Planting and caring of trees in and around the campus.
- ✓ Timely disposal of wastes from the campus.

- ✓ Celebration of important days like World Environment Day with great importance.
- ✓ Plastic free practices.
- ✓ Distribution of medicinal plant saplings among students for plantation.

4.4 CONSOLIDATION OF AUDIT FINDINGS

We hope that students will develop a greater appreciation and understanding of the impact of their actions on the environment. They have successfully been able to determine the impacts on the environment through the various auditing exercises. By participating in this green auditing procedure they have gained knowledge about the need of sustainability of the college campus. It will create awareness on the use of the Earth's resources in their home, college, local community and beyond.

4.5 MAJOR AUDIT OBSERVATIONS

- ➢ The environmental awareness initiatives are not substantial.
- ➢ The training in vegetable cultivation and composting practices are inadequate.
- ➢ There is no Green policy/ environmental policy statement indicating the commitment of the college towards its environmental performance.
- ➢ Gardens inside the college premises are found well maintained.
- ➢ Use of notice boards and signs are inadequate to reduce over exploitation of natural resources.
- ➢ Programs on green initiatives have to be increased. Campus is declared plastic free, stringent actions should be taken to maintain this.
- ➢ Rain water harvesting systems, solar power generation, environmental education programs have to be strengthened.

4.5.1 WATER AUDIT

- ➢ There is no water consumption monitoring system in the college campus.
- ➢ The college does not have waste water treatment for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms.
- ➢ The waste water from laboratories, canteen and kitchens are not suitably controlled and are not used for gardening.

- The college has to take actions to strengthen rain water harvesting. Rain water harvesting for separate buildings are lacking. Measurement of quantity of water obtained from the rain water harvesting should be done.
- Automatic switching system is not installed for pump sets used for overhead tank filling.
- Per day use of water is very high and there is no control over wastage of water.
- Display boards against the misuse of water use are lacking.

4.5.2 ENERGY AUDIT

- The communication process for awareness in relation to energy conservation is found inadequate.
- Assessment of electrical load calculation is yet to be done by the college.
- Monthly use of electricity in the college is low.
- There are fans of older generation and non-energy efficient which can be phase out by replacing with new energy efficient fans.
- Regular monitoring of equipment and immediate rectification of any problems.

4.5.3 WASTE AUDIT

- Solid waste management systems established are insufficient.
- The college has proper communication with the local body for regular collection of solid waste from the campus.
- Implementation of sustainable projects to attain set environmental goals is not in place.
- Waste bins in the class rooms, veranda, canteen and campus are inadequate.
- Bio gas plant is not installed.
- Proper composting systems are lacking.

4.5.4 GREEN CAMPUS AUDIT

- Tree cover of the college with respect to the stakeholder strength is not enough.
- Regular planting of trees in the campus are inadequate.
- Display boards to all plants identified are lacking.
- No arboretum is set up in the college campus.
- There are only very few fruit trees in the college to attract birds.
- Registry for flora and fauna on the campus is lacking.
- Uses of herbs cultivated in the medicinal garden are not displayed.

4.5.5 CARBON FOOT PRINT AUDIT

- College has not yet taken any initiative for carbon accounting.
- Adequate common transportation facilities should be provided by the college.
- Encourage students to use cycles.
- **122** litres of fossil fuel is burned every day for the functioning of the college.

4.6 PREPARATION OF ACTION PLAN

Policies referring to college's management and approach's towards the use of resources need to be considered. The college should have a green policy/environmental policy for its sustainable development. The environmental policy formulated by the management of the college should be implemented meticulously. The college should have a policy on awareness raising or training programs (for ground staff or kitchen staff for example) and college also should have a procurement policy (the College's policy for purchasing materials).

4.7 FOLLOW UP ACTION AND PLANS

Green Audits are exercises which generate considerable quantities of valuable management information. The time and effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organisation and that action plans and implementation programs result from the findings.

Audit follow up is part of the wider process of continuous improvement. Without follow-up, the audit becomes an isolated event which soon becomes forgotten in the pressures of organisational priorities and the passing of time.

4.8 ENVIRONMENTAL EDUCATION

The following environmental education program may be implemented in the college before the next green auditing:

- Training programs in solid waste management, liquid waste management, setting up of medicinal plant nursery, water management, vegetable cultivation, tree planting, energy management, landscape management, pollution monitoring methods, and rain water harvesting methods.

- Increase the number of display boards on environmental awareness such as – save water, save electricity, no wastage of food/water, no smoking, switch off light and fan after use, plastic free campus etc.
- Activate participation from environmental clubs.
- Set up model rainwater harvesting system, rainwater pits, vegetable garden, medicinal plant garden etc. for providing proper training to the students.
- Conduct exhibition of recyclable waste products.
- Implement chemical treatment system for wastewater from the laboratories.
- Students and Staff members may be made totally aware of pollution caused by use of vehicles.
- The carbon consumption awareness programs on carbon emission at individual as well as social level will help to avoid air and noise pollution in the campus due to vehicles.

4.9 CONCLUSION AND FULL LIST OF RECOMMENDATIONS

The green audit assists in the process of testing performance in the environmental arena and is fast becoming an indispensable aid to decision making in a college. The green audit reports assist in the process of attaining an eco-friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices. A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development. It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organisation. An outside view, perspective and opinion often helps staff who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

4.9.1 COMMON RECOMMENDATIONS

- ❖ Adopt an environmental policy for the college.
- ❖ Establish a purchase policy for environmental friendly materials.
- ❖ Conduct more seminars and group discussions on environmental education.
- ❖ Students and staff can be permitted to solve local environmental problems.
- ❖ Renovation of cooking system in the canteen to save gas.
- ❖ Establish water, waste and energy management systems.

4.9.2 CRITERIA WISE RECOMMENDATIONS

4.9.2.1 RECOMMENDATIONS FOR WATER

- ❖ Remove damaged taps and install sensitive taps.
- ❖ Drip irrigation for gardens and vegetable cultivation can be initiated.
- ❖ Establish rain water harvesting systems for each building.
- ❖ Establish water treatment systems.
- ❖ Awareness programs on water conservation to be conducted.
- ❖ Install display boards to control over exploitation of water.

4.9.2.2 RECOMMENDATIONS FOR ENERGY

- ❖ Employment of more solar panels and other renewable energy sources.
- ❖ Conduct more save energy awareness programs for students and staff.
- ❖ More energy efficient fans should be replaced.
- ❖ Observe a power saving day every year.
- ❖ Automatic power switch off systems may be introduced.

4.9.2.3 RECOMMENDATIONS FOR WASTE

- ❖ Establish a functional bio gas plant.
- ❖ A model solid waste treatment system to be established.
- ❖ Practice of waste segregation to be initiated.
- ❖ A model Vermicomposting plant to be set up in the college campus.
- ❖ Establish a plastic free campus.
- ❖ Avoid plastic plates and cups for in the college.

4.9.2.4 RECOMMENDATIONS FOR GREEN CAMPUS

- All trees in the campus should be named scientifically.
- Create more space for planting.
- Grow potted plants at both corridor and class rooms.
- Create automatic drip irrigation system.
- Not just celebrating environment day but making it a daily habit.
- Beautify the college building with indoor plants.
- Providing funds to nature club for making campus more green.

4.9.2.5 RECOMMENDATIONS FOR CARBON FOOTPRINT

- Establish a system of car-pooling among the staff to reduce the number of four wheelers coming to the college.
- Introduce college bus services to the students and staff.
- Encourage students and staff to use cycles.
- Establish a more efficient cooking system to save gas.
- Discourage the students using two wheelers for their commutation.
- More use of generators every day should be discouraged.

CHAPTER 5

EXIT MEETING

The exit meeting was conducted by Prof. Subhendu Sekhar Bag. It was a mechanism to provide the management and staff a broad feedback on the preliminary findings of the audit team before completing the audited report. The exit meeting was held in the college on 21st December, 2021. Clarification on certain information gathered was sought by the audit team from the management and staff of the college.

DRAFT AUDIT REPORT

The information gathered by the audit team was consolidated as a draft audit report. This draft report was then circulated to the audit team and those directly concerned with the audit to check the report for accuracy. The draft green audit report was also discussed in the exit meeting.

FINAL AUDIT REPORT

The final audit report is the corrected final document which contains the findings and recommendations of the audit. It will also form one of the bases of future audits because the information it contains informs some of the tests and analyses that need to be performed in the future. Final Audit Report was submitted on 30th December, 2021 to the Principal of the college.

FOLLOW UP AND ACTION PLANS

Green audits form a part of an on-going process. Innovative green initiatives have to be designed and implemented every year to make the college environmentally sustainable. Follow up programs of green auditing recommendations should be done meticulously before the next audit.

NEXT AUDIT

In order to promote continuous improvement, it is recommended to conduct the next green auditing during the year 2023.

TRANSPARENCY OF GREEN AUDIT REPORT

Green audit report is one of the useful means of demonstrating an organisation's commitment to openness and transparency. If an organisation believes it has nothing to hide

from its stakeholders, then it should feel confident enough to make its green audit reports freely available to those who request them. As a basic rule, green audit reports should be made available to all stakeholders.

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