GREEN AND ENVIRONMENTAL AUDIT REPORT

(2021-2022)

LAKHIMPUR GIRLS' COLLEGE, NORTH LAKHIMPUR, ASSAM

PREPARED BY

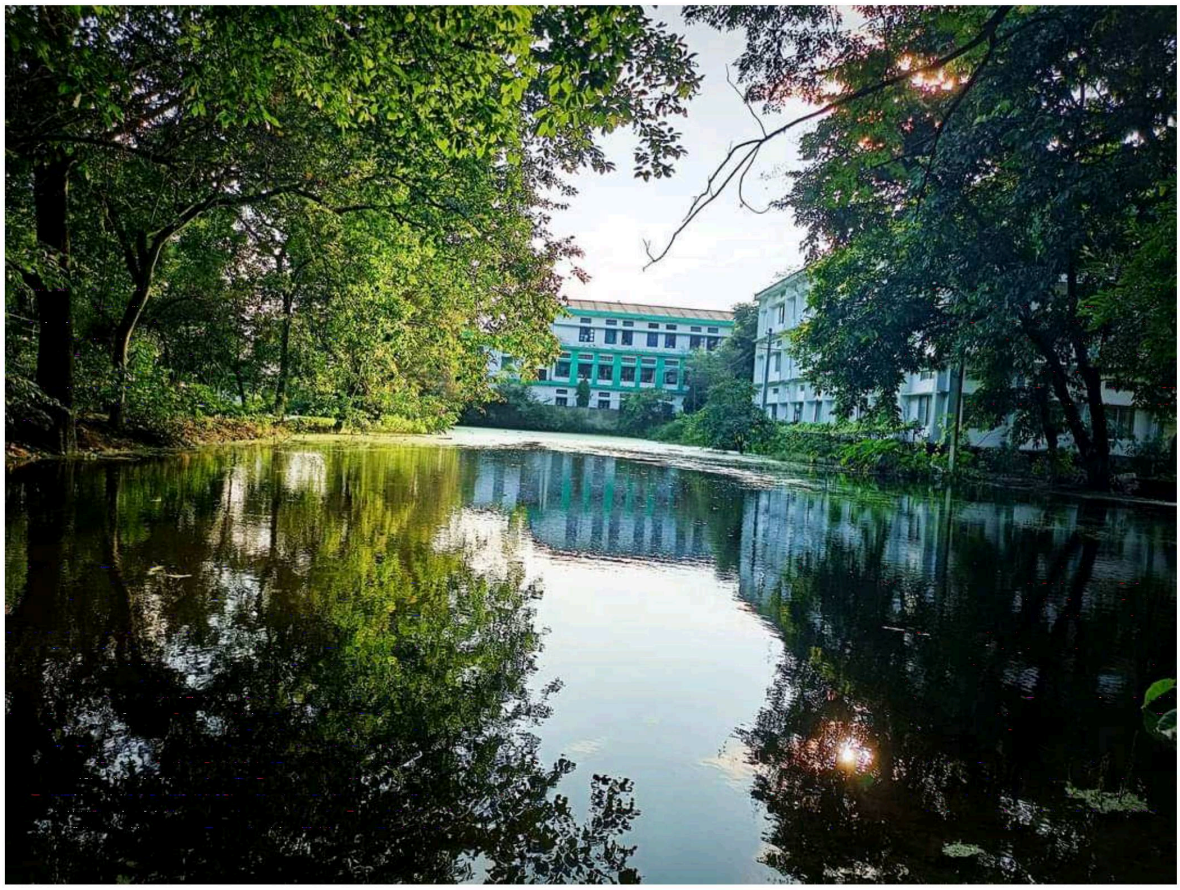
SOCIETY FOR ENVIRONMENTAL PROTECTION, EDUCATION AND RESEARCH

GUWAHATI-781014

ASSAM

"Nature holds the key to our aesthetic, intellectual, cognitive and spiritual satisfaction"

- Dr. Edward O. Wilson



SOCIETY FOR ENVIRONMENTAL PROTECTION,
EDUCATION AND RESEARCH (SEPER)
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Dated. 12/07/22

SEPER
Estd. 1989

CERTFICATE

This is to certify that the Green and Environmental Audit of Lakhimpur Girls' College, North Lakhimpur, Assam has been carried out by a team of qualified members of the Society for Environmental Protection, Education and Research (SEPER) and under the supervision of the undersigned. This assessment work was carried out within a very short period of time and with limited resources and therefore there remains more to be investigated for a comprehensive Green Audit report for the college.

I offer my best wishes to the college in its pursuit for excellence in higher education and all its future endeavors.

Prof. (Retd.) Hari Prasad Sarma
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PREFACE

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this backdrop it becomes crucial to embrace the system of the Green Campus for the institute which will lead for sustainable development. The conduction of Green Audit of an educational institution is quite essential to analyse the environmental performance of the institution and to find possible solutions for converting the educational campus into an eco-campus.

The green and environmental audit of Lakhimpur Girls' College, Assam was mainly emphasized on certain indicating parameters like consumption of energy in terms of electricity, quality of water, water use and conservation, vegetation cover, biodiversity, waste management practices etc. Finally, the present report pertaining to strengths, weaknesses and suggestions on the various environmental parameters of the campus is delivered as an output of the audit process

Lakhimpur Girls' College, Assam, is deeply concerned and believes that there is a dire need to address the problems and reverse the trends. The motive of the audit was to assess the practices followed in the campus are in accordance with the green policy adopted by the institution and in compliance with the Indian standards and environmental rules. The methodology included: questionnaire survey, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Alternative Energy and Mapping of Biodiversity.

An environmental audit is a snapshot in time, in which one assesses campus performance in compliance with applicable environmental laws and regulations. Though a supportive benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. This audit report contains observations and recommendations for improvement of environmental consciousness.

Prof. (Retd.) Hari Prasad Sarma

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1. INTRODUCTION

The development of a nation begins from its educational institutions, where the ecology associated with the environment is considered to be a paramount facet for development. Nowadays, the educational institutions have become more empathetic towards various environmental factors and as such more and more ideas are being launched in order to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc., However, such activities pursued by the institutes might end up in the creation of a variety of adverse environmental impacts.

The term "Green" means eco-friendly or not damaging the environment. This can acronymically be called as "Global Readiness in Ensuring Ecological Neutrality" (GREEN). Green audit is all about corporate responsibility. It unveils the truth about statements made by governments and institutions with regard to the effects of environmental pollution. The aim of green audit is to review the measures taken by the company to combat pollution.

Green audit is defined as "an official examination of the effects a company has on the environment". It is also widely known as Environmental Audit. Green Audit can be better understood as: Compliance of Environmental Laws, Audit of Environment Cost and Environment Impact Assessment, and Carbon Credit.

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyse environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience.

The concept of Green Audit was initiated with the beginning of 1970s with the motive of inspecting the work within the organizations whose exercises can cause risk to the health of inhabitants and the environment.

Green audit can act as a useful mechanism for a college to determine how and where most of their energy or water or other resources are being used; accordingly, the college can consider how to administer necessary 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. Besides, it can create consciousness towards health and promotion of environmental awareness, values and ethics. It imparts staff and students better understanding of Green impact on campus. 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 towards a sustainable future. As environmental sustainability is becoming an increasingly crucial issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The National Assessment and Accreditation Council (NAAC), Bengaluru has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

Therefore, the motive of green audit is to enhance the condition of the environment in and around institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environment friendly institute. A lot of initiatives are taken forward by many institutions to rectify the problems but are not properly documented owing to lack of green documentation awareness. All this non-scholastic efforts of the administrations play an important role in ensuring the green quotient of the campus is intact.

Green Audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council, which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation.

1.1. BENEFITS OF GREEN AUDIT:

There are many advantages of green audit for an educational institute. Some of the important advantages can be highlighted as follows:

a) It helps in the management and protection of the environment in and around the campus.
b) Identifies the various cost saving methods of environmental protection through waste minimization and energy conservation.
c) Empowers the organization to frame better policy towards compliance of environmental rules and regulations
d) It allows the college/university authority to monitor the environmental performance of the institute
e) It portrays a good image of the institution through its clean and green campus.
f) Finally, it helps the concerned institute to build a positive societal impression through its green initiatives.

1.2. OBJECTIVES OF GREEN AUDIT

The main objectives of carrying out the Green Audit for the Lakhimpur Girls' College are as follows:

i. To describe the general land use pattern of the college
ii. To document the floral and faunal diversity of the college
iii. To review the status of ambient environmental conditions of water, air and noise of the college against applicable standards
iv. To document the waste generation and review the waste disposal system of the college
v. To document the energy uses and conservation in the college
vi. To analyze the awareness level within the college premise for environmental policy and objectives

2. METHODOLOGY

The methodology adopted in order to perform the green audit for the college included different approaches and tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis. Further, suggestion and recommendations were formulated based on the collated data and based on standard rules, regulations and literature. The study covered the following areas to describe the present environmental conditions of the campus and its management thereof:

- Landuse
- Campus Biodiversity
- Water Quality, Use and Management
- Energy Usage and Conservation
- Waste Generation and Waste management
- Campus Cleanliness

3. OBSERVATIONS

3.1.OVERVIEW OF THE COLLEGE

Lakhimpur Girls' College, established with Pre-University classes on 16th August, 1972, was the lone and foremost seat of higher education for women on the entire north bank of the mighty Brahmaputra. The college inaugurated on 16th August 1972, was named as North Lakhimpur Girls' College. Its first Principal was Ms. Punya Hazarika and first Vice-Principal, Mrs. Hellena Begum. The classes of the college were held in the premises of North Lakhimpur Govt. Girls' High School in the morning hours from 7 A.M to 9.30 A.M. Ms. Punya Hazarika resigned from the post of Principal on 22nd September 1974. From 23rd September 1974 to 30th June 1992, Mr. Mohan Chandra Roy was the Principal of the College. During his tenure the College from her infancy marched forward to her youth. Amidst innumerable hindrances, financial difficulties, the institution progressed to impressive growth. In 1974, when Mr. Mohan Chandra Roy joined as the Principal, there were only three students in the Pre-degree classes. But as the time of his

retirement in 1992, there were over 1400 students in the Pre-degree and degree classes.

Dr Surajit Bhuyan joined as Principal of the college on 19th September, 2015. He has initiated the process for RUSA 2.0 grants. Complete renovation of the library has been accomplished and it has been digitalised. Construction of a new class room building is going on and some other works are in the pipeline under RUSA 2.0 grant. Other works done so far during his tenure include the construction of a new hostel building, a digital class room, a language lab and a computer lab with all facilities. College admission process and student's attendance system have been digitalised. The college is also planning to introduce 4 years integrated B.Ed. course from the session 2022-2023.

Table 1: Population of the college

Total no. of students	**UG**	**1350**	**1370**
	PG	**20**	
No. of teaching staff	**Permanent**	**57**	
	Others	**15**	
No. of non-teaching staff	**Permanent**	**23**	
	Others	**10**	

3.2. GENERAL ENVIRONMENTAL SETTING

Lakhimpur district of Assam is located between 26°48'00'' and 27°53'00'' North Latitude and 93°42'00'' and 94°20'00'' East Longitude. The district is bounded by the Siang and Papum Pare District of Arunachal Pradesh on the north, by Dhemaji District and Subansiri River on the east, Majuli Sub Division on the south and Gohpur sub division on the West.

Climatologically, the district is characterised as subtropical with high humidity and high rainfall. The average annual rainfall is 3268 mm with as relative humidity of 74%. Lakhimpur district receives the monsoon rainfall from the month of April and continues up to September/October. Northern part of the district which is geographically located at the foothills of Arunachal Himalayas, receives the maximum rainfall within the district. The maximum temperature in the district

reaches up to 35°C during June / July and the minimum temperature falls to around 8°C in the months of December and January.

Based on geology and hydrogeological characteristics, the district has two distinct hydrogeological units - semi-consolidated and unconsolidated formations. The semi-consolidated formation is composed of Neogene Siwalik Group of rocks bordering the northern boundary of the district.

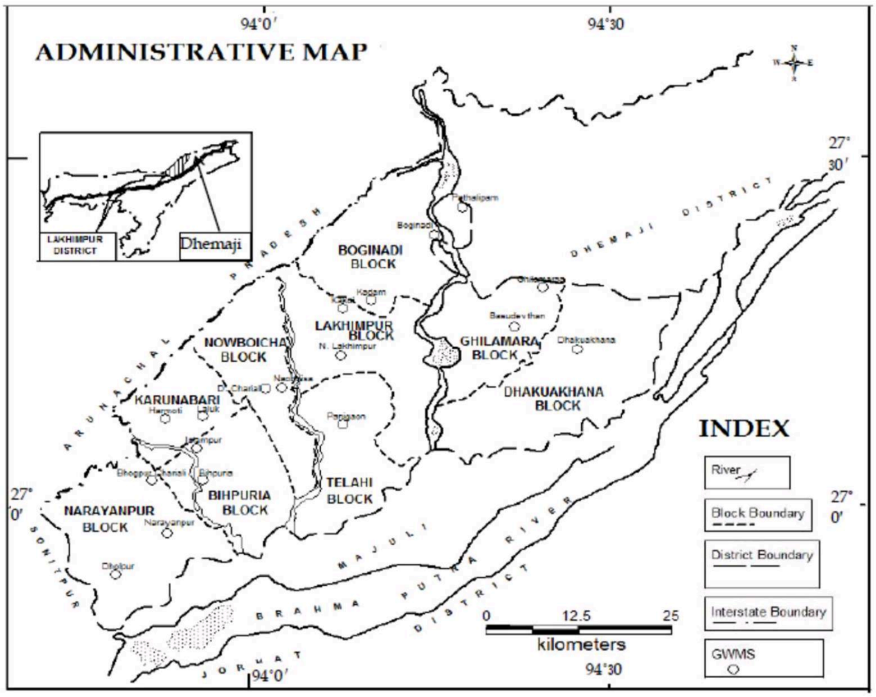

Figure 1: Administrative map of Lakhimpur Girls' College

3.3. LAND USE

Lakhimpur Girls' College has a total land holding of 30353.442 square meter of which approximately 1870 square meter is classified as water bodies mainly ponds. Approximately 190 square meter of the total area can be classified as under green cover (Table 1). The presence of four gardens inside the campus augments the aesthetic value of the college.

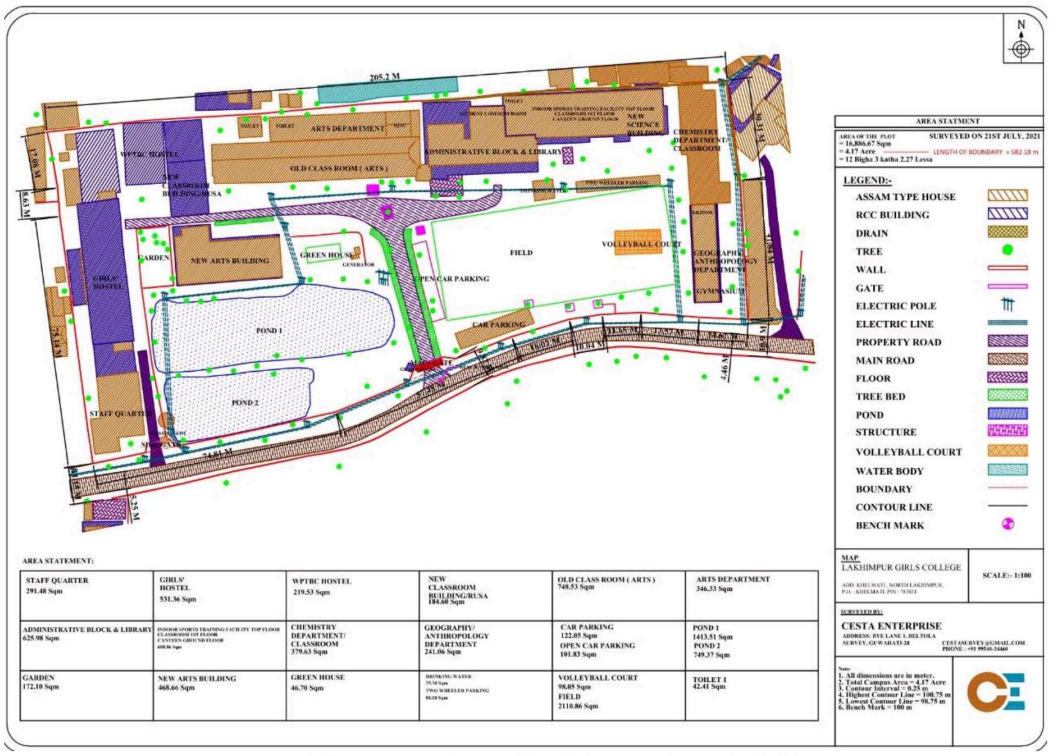

Figure 2: Map of Lakhimpur Girls' College

The total land holding of the college is declared to be around 30353.442 square meters. Considering the gardens, waterbodies etc. present inside the college campus, it can be said that the around 30-40% of total area provides a good ecological habitat for a wide variety of flora and fauna which are listed in the following pages.

Table 2: Summary of land use/ land cover of the college campus

Land use category	**Type**	**Area (square meter)**
Gardens	Garden-I (in front of Administrative Building	24
	Garden-II (in front of Old Arts Building)	20
	Garden-III (Left side of New Arts Building)	50
	Garden-IV (in front of Hostel)	96
Water bodies	Pond	1870
Roads	Gravel roads	199
	Kutcha roads	60
Built-up area		12382.713
Total Land Holding		**30353.442**

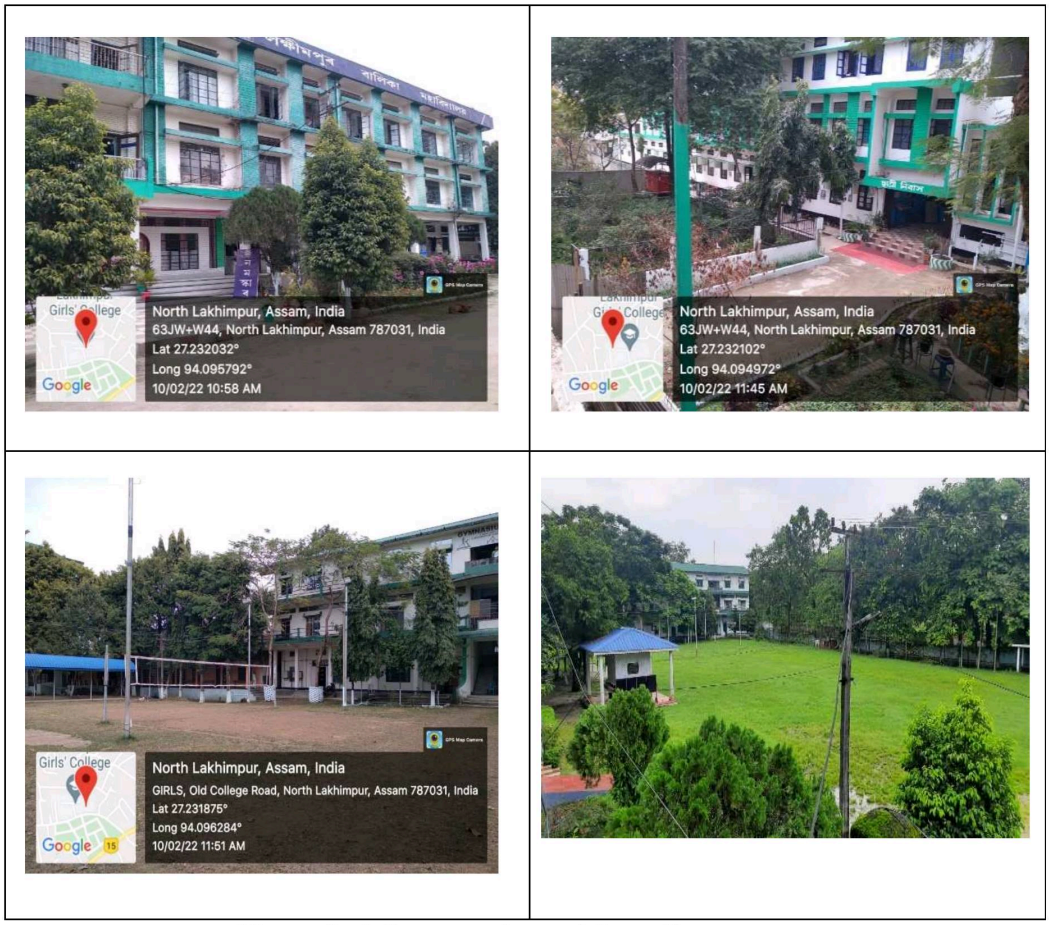

Figure 3: A few snapshots of the college campus

3.4. CAMPUS BIODIVERSITY

The college authorities have taken up the process of documentation of flora and fauna of the campus. As per the data provided, the campus has not less than 30 species of avifaunal visitors and at least 9 species of herpetofauna (Tables 4, 5). Also the waterbodies of the college campus harbours 10 species of fish fauna (Table 3).

Table 3: List of fishes found in the ponds of the college campus

LOCAL NAME	SCIENTIFIC NAME
Goroi	*Channa punctata*
Sengeli	*Channa gachua*
Hol	*Channa striata*
Kawoi	*Anabas testudineus*
Rohu	*Labeo rohita*

Bahu	*Catla catla*
Puthi	*Puntius sarana*
Hingi	*Heteropneustes fossilis*
Kuchia	*Monopterus cuchia*
Kholihona	*Trichogaster fasciata*

Table 4: List of Herpetofauna Observed In The Campus

COMMON NAME	**SCIENTIFIC NAME**
Asian tree frog	*Chirixalus simus*
Jerdon's bullfrog	*Hoplobatrachus crassus*
Asian bullfrog	*Hoplobatrachus tigerinus*
Garden skink lizard	*Eutropis carinata*
Common house gecko	*Hemidactylus frenatus*
Indian rat snake	*Ptyas mucosa*
Indian cobra	*Naja naja*
Greater black krait	*Bungarus niger*
Printed bronzeback	*Dendrelaphis pictus*

Table 5: List of Avifauna

COMMON NAME	**SCIENTIFIC NAME**
Asian Koel	*Eudynamys scolopaceus*
Asian pied sterling (Indian pied Myna)	*Gracupica contra*
Common Myna	*Acridotheres tristis*
Jungle Myna	*Acridotheres fuscus*
Black Drongo	*Dicrurus macrocercus*
Common Tailor bird	*Orthotomus sutorius*
Black hooded Oriole	*Oriolus xanthornus*
House Crow	*Corvus splendens*
House Sparrow	*Passer domesticus*
Crimson sunbird	*Aethopyga siparaja*
Indian Treepie	*Dendrocitta vagabunda*
Oriental magpie Robin	*Copsychus saularis*
Red vented Bulbul	*Pycnonotus cafer*
Common Iora	*Aegithina tiphia*
Great Tit	*Parus major*
White-rumped Munia	*Lonchura striata*

White throated kingfisher	*Halcyon smyrnensis*
Common kingfisher	*Alcedo atthis*
White breasted water hen	*Amaurornis phoenicurus*
Blue throated barbet	*Megalaima asiatica*
Coppersmith barbet	*Megalaima haemacephala*
Lineated barbet	*Megalaima lineata*
Greater golden back/ Buff-spotted flame back	*Chrysocolaptes lucidus*
Black Kite	*Milvus migrans*
Indian pond Heron	*Ardeola grayii*
Domestic Duck/ wild duck	*Anas platyrhynchos*
Spotted Owlet	*Athene brama*
Barn Owl	*Tyto alba*
Domestic pigeon/ rock dove	*Columba livia domestica*
Spotted Dove	*Stigmatopelia chinensis*

Table 6: List of trees found in the college campus

LOCAL NAME	**SCIENTIFIC NAME**
Sotiyona	*Alstoni scholaris* (L) R. Br
Christmas gos	*Araucaria columnaris*
Tamul	*Areca catechu* Linn.
Moha- neem	*Azadirachta indica* A. Juss.
Thuja	*Biota orientalis L.*
Sendur gos	*Bixa orellana* L.
Kagoj phul	*Bougainvillea spactabilis* Willd.
Doopor- tenga.	*Bryophyllum calycinum*. Salisb.
Bottle brush	*Callistemon viminalis* (sol. Ex Gaertn.) Byrnes
Asomia chah	*Camellia sinensis* var assamica
Kagzi- nimboo	*Citrus acida.* Roxb.
Gol- nimboo	*Citrus aurantiifolia.* Roxb.
Narikol	*Cocos nucifera* L.
Sisso	*Dalbergia sissoo* Roxb.
Krihna chura	*Delonix regia* (Boj. Ex Hook). Raf
Amlokhi	*Emblica officinalis* Geartn.
Eucalyptus	*Eucalyptus obconica* L.
Jori	*Ficus retusa* L.
Gomari	*Gmelina arborea* Linn.

Joba Ful	*Hibiscus rosa-sinensis* L.
Rangol phool	*Ixora coccinea.* Linn.
Khorikajai	*Jasminum multiflorum* Roth.
Ajar	*Lagerstroemia flos-reginae* Retz.
Aam	*Mangifera indica.* Linn.
Ghora neem	*Melia azedarach* Linn.
Nahor	*Mesua ferrea* Linn.
Bokul	*Mimusops elengi.* Linn
Nuni	*Morus indica* Linn.
Norosingho	*Murraya koenigii* Spreng.
Korobi	*Nerium indicum* Mill.
Sewali phool	*Nyctanthes arbor-tristis* Linn.
Debadaru	*Polyalthia longifolia* Sonn. var. *Pendula*
Modhuriam	*Psidium guajava* L.
Boga golap	*Rosa alba.* Linn.
Tezi golap	*Rosa centifolia.* Linn.
Ronga golap	*Rosa damascene* Mill.
Chati goch	*Samanea saman (Jaq.) Merr.*
Madula	*Sassafras albidum* (Nutt.) Nees
KolaJamu	*Syzygium cumini* (L.) Skeels.
Bogi- Jamu	*Syzygium jambos* (L) Alston
Kothona phul	*Tabernaemontana divaricata* R.Br. ex Roem. & Schult
Silikha	*Terminalia chebula* Retz.
Arjun tree	*Terminalia arjuna.* Weight & Arn.
Khandbahale.	*Tradescantia pellida* (Rose) D.R. Hunt
Bogori	*Zizyphus mauritiana.* Lam.

Table 7: List of herbs found in the college campus

COMMON/LOCAL NAME	**SCIENTIFIC NAME**
Germany bon	*Ageratum conyzoides*
Seujiakochu	*Alocasia fornicate*
Mankochu	*Alocasia indica*
Mati kaduri	*Alternanthera sessilis*
Hati khutura	*Amaranthus spinosus*
Khutura sak	*Amaranthus virdis*
Satmul	*Aspergus recimosus*
Dolisha Bon	*Axonopus compressus*
Ponounoa	*Boerhavia repens*
Bhang	*Canabis sativa*
Bor manimoni	*Centilla asiatica*

Jhil mil	*Chenopodium album*
Bonguti	*Chrysopogan aceculatus*
Kola kochu	*Colocasia esclulenta*
Konasimolu	*Commelina bengalensis*
Bon kopah /bon tulsi	*Cotton bonoplandianum*
Duboribon	*Cynodon dactylon*
kanyabon	*Cyperus brevifolius*
Lai jabori	*Drymaria cordata*
Laijabori	*Drymaria cordata*
Dhatura	*Dutura stramonium*
Keheraj	*Eclipta prostate*
Keharaj	*Eclipta prostrate*
Bobasa bon	*Eleusine indica*
Mandhania	*Eryngium foetidum*
Chamholok	*Eupatorium odoratum*
Dudma	*Euphorbia hirita*
Dhemasi sak	*Fagopyrum esculentum*
Bhotmula	*Gynondropsis gyandra*
Provabati	*Gynura lycopersicifolia*
Saru mainimuni	*Hydrocotyl rotundifolia*
Gonga tuloshi	*Hyptis suaveolens*
Dudhkuri lota	*Ichnocarpus frutescens*
Kolmow	*Ipomoea aquatic*
Madhuri lota	*Ipomoea digitata*
Kunja lota	*Ipomoea quamoclit*
Panikhootora	*Jussiaea repens*
Barisundari	*Justia simplex*
Keya bon	*Kyllinga brevifolia*
Boga doron	*Leucus linifolia*
Bilahi	*Lycopersicon esculentum*
Keturi halodhi	*Martanta arudinaceae*
Poduna	*Menthe arvensis*
Bon podina	*Menthe spicata*
Lajuki bon	*Mimosa pudica*
Godhuli gopal	*Mirabilis jalapa*
Boga bhet	*Nymphaea alba*
Kolia tulosi	*Ocimum sanctum*
Bor tengashi	*Oxalis corniculata*
Soru tengashi	*Oxalis corniculata*
Paniamlokhi	*Phyllanthus niruri*
Jivasusa	*Phyllanthus olaracea*
Bihlogoni	*Polygonum hydropiper*
Bon jolokia	*Scoparia dulsis*

3.5.DRINKING WATER QUALITY

Drinking water in the college campus is mainly extracted from the groundwater aquifer through deep boring wells and using submersible pumps. The water extracted is used for drinking is collected by individuals from the electrical filters (Brand – Eureka Forbes/Aquaguard model) (Fig. 4). Drinking water quality data is currently not available and hence the present audit tam referred to earlier published data from the locality. The audit team referred to the Central Groundwater Board data booklet for Lakhimpur district. According to that report, the major chemical parameters were within the permissible limits as specified by BIS (2003), except for high concentration of iron which ranged from 0.16 to 3.76 mg/l in most of the area of the district. Similarly, another study reported that Iron content generally varied from 0.13 to 6.98 mg/l. Thus, it is observed that iron content is generally high in the district and generally associated with permanently water-logged areas. Therefore, treatment of groundwater for Iron shall be a general necessity for locations across the district including the Lakhimpur Girls' College. Staining due to high iron concentration in groundwater is a major aesthetic problem. Apart from that, another study on groundwater quality of Lakhimpur district reported that of the total samples tested in the research, 5% had Arsenic content above the ISI limit of 0.05mg/L. Thus, based on data available from secondary sources, it is suggested that the college should test its own groundwater quality through an agency like PCBA, IASST, IIT etc. for ascertaining the concentrations of health-wise significant parameters like Fluoride, Arsenic, Heavy metals etc.

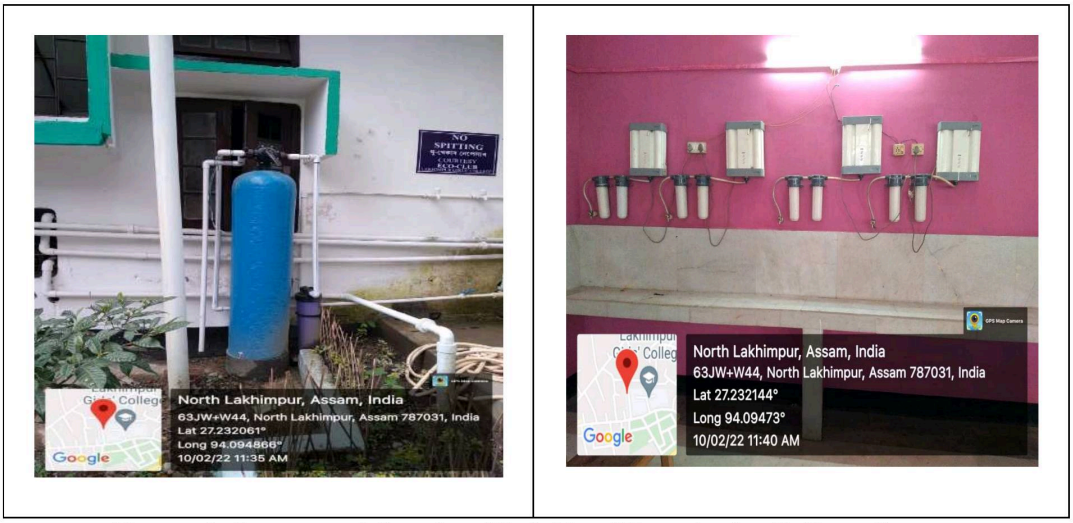

Figure 4: Source and Supply of Drinking Water in the College Campus

3.6. WATER USE AND CONSERVATION

Table 8: Storage capacities of water tanks of the college campus

Sl. No.	Location	Nos. of Tank	Size (Ltr)	Total Capacity (Ltr)
1	Hostel	4	1000	4000
2		8	5000	40000
3		1	500	500
4	Administrative Block	4	2000	8000
5	Science Block	2	2000	4000
6	New Arts Building	1	1000	1000
	Total Reservoir Capacity (Ltr)			57500

Water use and conservation is a very important issue that comes within the ambit of environmental audit. The Lakhimpur Girls' college is highly dependent upon groundwater for carrying out daily activities. The college has 8 (eight) numbers of boring wells and equivalent numbers of submersible pumps. The college has to cater to water needs of a population of more than 1400 person per day. To meet those needs, the college has set up several polymer (PVC) water tanks across the campus (Table No. 8). The total reservoir capacity stands at 57500 litres which is extracted from the groundwater aquifer. Although the groundwater potential of Lakhimpur district is depicted to be very high as per CWGB reports, yet, the extraction is not recommended for various reasons. Particularly, to avoid geogenic contamination of drinking water due to Arsenic, Fluoride, heavy metals etc., the use of groundwater should be avoided. Electricity consumption can also be reduced if, the number of times the water is being pumped is reduced. This can be achieved by using surface water supply sources like ponds and also through using rain water. The college has started an initiate of rain water harvesting which is capable of storing 1000 Litres. But this facility should be augmented by making arrangement for each and every building and also make provisions for groundwater recharge using the rain water. Such steps will play an important role, if not large, in maintaining the overall water balance in the long run.

(a) (b) (c)

Figure 5: (a) Rainwater Harvesting (b) Collection of waste water from RO filter (c) Groundwater extraction

3.7. AIR QUALITY

Air quality studies are one of the most important components of environmental audit process. However, such studies or datasets are unavailable for higher educational institutes and the present case of Lakhimpur Girls' college is also not different. In the absence of primary air quality data for the college or its vicinity, the audit team had to refer to secondary data source. Pollution Control Board of

Good (0-50)	Minimal Impact	Poor (201-300)	Breathing discomfort to people on prolonged exposure
Satisfactory (51-100)	Minor breathing discomfort to sensitive people	Very Poor (301-400)	Respiratory illness to the people on prolonged exposure
Moderate (101-200)	Breathing discomfort to the people with lung, heart disease, children and older adults	Severe (>401)	Respiratory effects even on healthy people

Figure 6: Air Quality Criterions based on AQI values

Assam had published Air Quality Index (AQI) for several towns of the state in the year 2015 based on their own data generated for the period of Jan-June, 2015. Based on such data, the PCBA had calculated the AQI for each town and categorised them according to CPBCB criteria. Based on the AQI published at that time, Lakhimpur had an AQI value of 88 (Fig. 7) which according to CPCB criteria indicates "Satisfactory" air quality (Fig. 6). Now, over the last 7 years, post this study, the region has witnessed significant rise in population, urbanisation, deforestation and vehicular pollution. Therefore, it can be expected that the overall air quality of the Lakhimpur may not have improved but may have deteriorated. This aspect needs thorough investigations using sophisticated instruments. Under such unknown conditions, to reduce any negative impacts of air quality degradation, the college authority on its own can take up initiatives like plantation

within and outside the campus. As reported such activities have been widely taken up by the Eco-club of the college.

3.8. WASTE MANAGEMENT

Any educational institution can generate different kinds of wastes depending upon the population, the type of curriculum, facilities etc. of the institute. The college has a total population of more than 1400 persons during working hours including around 250 hostel residents. The college offers science courses and has laboratories and other such facilities which are capable of generating different categories of wastes like chemical, biological and also e-wastes apart from the usual solid wastes. The college authority has installed more than 50 nos. of waste collection bins across the entire college campus. Also, there are 3 nos. of concrete waste dumping cubicles located at different zones from which the wastes are collected by the municipal authorities. The college have installed a traditional bio-sand filter for treatment of liquid wastes of chemistry department before

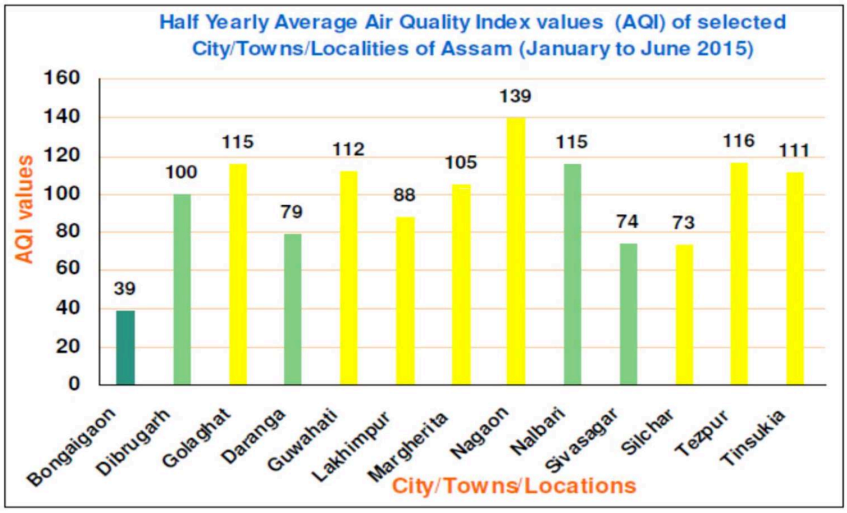

Figure 7: AQI Values (Half Yearly) Of Selected Localities Of Assam (January to June, 2015)

discharging the effluent into drainage system. The college have also installed an incinerator for disposal of sanitary napkins. Although the college has taken up a good initiative for waste management, but such activities are not adequate. Further, there is a necessity to review existing working policies of the college with regards to compliance of environmental rules and regulations, e.g., there is the necessity of installing colour coded bins in biological for waste segregation as per Indian rules. Additionally, e-wastes should be managed as per standard guidelines issued by PCBA and CPCB wherein recognised e-waste dealers needs to be assigned for dealing with e-wastes.

(a) **(b)**

Figure 8: (a) Incinerator (b) Liquid waste management facility

3.9. CAMPUS CLEANLINESS

In matters of cleanliness in educational institutes and also in our personal lives we may seek motivation in the words of Benjamin Disraeli – ***"Cleanliness and order are not matters of instinct; they are matters of education, and like most great things, you must cultivate a taste form them"***. It is worth mentioning that the Lakhimpur Girls' College is doing all that needs to be done in pursuing a clean campus and have also strived hard to inculcate the virtue of cleanliness among the students through various activities. The college has conducted many cleaning programmes in tandem with the national flagship programme of Swachh Bharat Abhiyan. A recent activity of the college taken up last year is one the many programmes conducted in past five years details of which are depicted as follows:

Cleaning Programme	Lakhimpur Girls' College	Swachh Bharat	2021	50	View/ Download	View/ Download

The college authority has also constructed permanent, concrete dustbins within the campus apart from the portable plastic dustbin located across the whole campus. Also, appropriate signage motivating cleanliness and displaying college rule with regards to maintaining clean campus was also seen across the campus. Such financial investments indicate the serious approach of the college authority towards maintaining a clean campus.

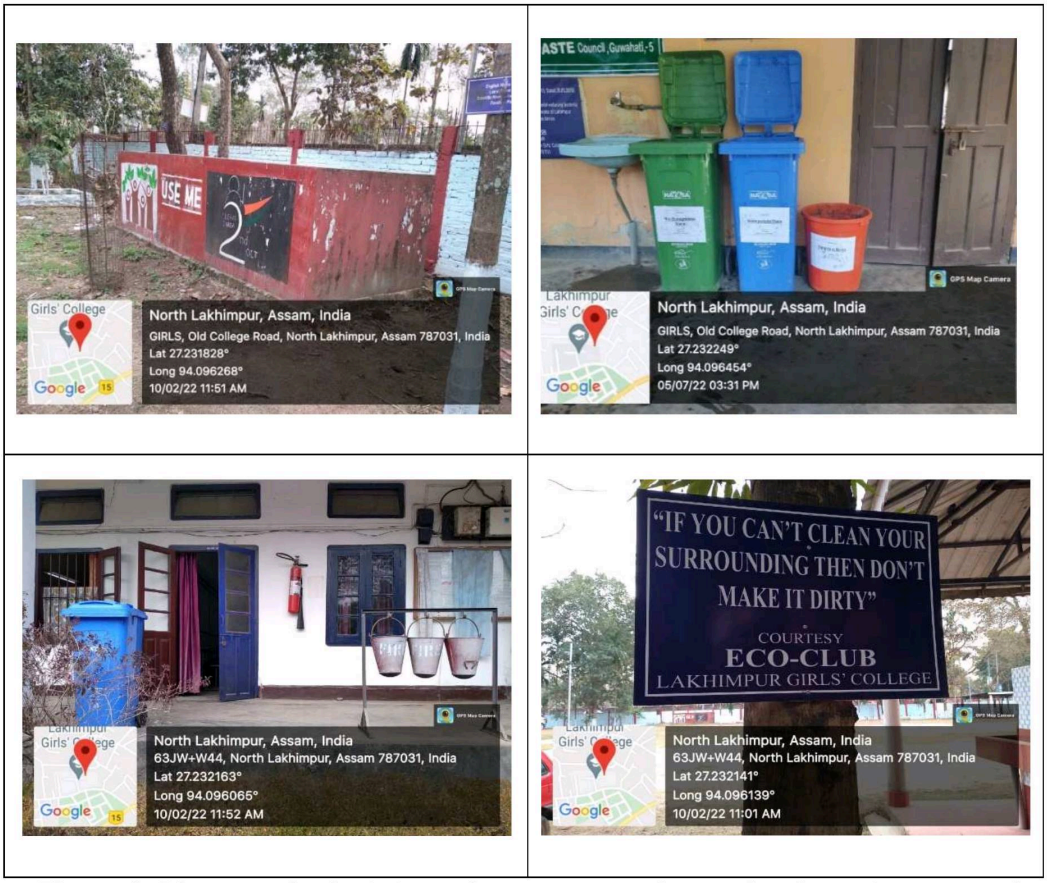

Figure 9: Photographs depicting a few measures taken up for the maintenance of campus cleanliness

3.10. ENERGY USE AND CONSERVATION

Energy crisis is one of the most important environmental issues in the age of Anthropocene. Every individual and organization must strive for conservation of energy and reduce dependence on conventional energy sources. Educational institutes have the moral responsibility towards preaching and practicing the concept of energy conservation. Lakhimpur Girls' College is at present consuming electricity at a connected load of 58 kW against a contract demand of 68.24 kVA for the entire college. Although the college has installed 4 nos. of solar street lamps, yet it is hugely dependent upon the conventional electricity being supplied by APDCL. The college is spending a large sum of money for electricity bills, which totals to a tune of around Rs. 5.75 lacs per year (based on last financial year data).

However, considering the open space available in the campus, the college can adopt a comprehensive plan for setting up solar power grid which will help in saving conventional energy as well as finances. The government of Assam has specific solar power programmes. Usage of rainwater harvesting systems and use of treated water from ponds and wetlands will reduce the necessity of extracting groundwater using electrical water pumps. This will minimize further consumption of electricity and decrease the financial load of the college.

3.11. BEST ENVIRONMENTAL PRACTICES

Nowadays every educational institution takes up some kind of regular activities that are thought to promote environmental sustainability. However, only few of such activities are taken up on longer term basis or are set up permanently to serve for many years to come. Such activities are capable of inculcating positive mindset among the staff and students of the institute. These activities are generally termed as best environmental practices which in the long run are capable of bringing about behavioural change and also contribute to sustainability in truest sense. Lakhimpur Girls' College has also tried to establish such best practices. Five such practices observed by the audit team are:

i. The college have many science departments. Of these, the Chemistry Department uses substantial amount of chemicals on daily basis as part of their curriculum. The spent up chemicals are generally disposed through wet cleaning methods and thus liquid wastes are generated. The department has taken up the initiative of treating such liquid wastes using a bio-sand filter before allowing it to be released into the municipal drainage system or the environment. Such practice of waste management, though in rudimentary form, is exemplary for not only other such departments, but also for all HEIs in general.
ii. The college authority has installed an incinerator in the hostel campus for disposal of sanitary napkins. Given, the population of 200 girls in the hostels, it is definitely a positive action on the part of the authority.

Incineration is considered to be the best kind of disposal in respect of disposable sanitary napkins. However, the college should take up necessary steps for complying with the rules with regards to emission standards for bi-medical waste incinerators.

iii. The college have installed 4 numbers of solar street lamps. This is a small but a sustainable initiative towards energy conservation. Given the size of the campus, the no. of solar powered lighting and appliances can be increased substantially

iv. The college have installed a simple system of rain water harvesting in the Administrative building. The rainwater from the rooftop is collected via PVC ducts and stored in a1000Ltr reservoir. This can be considered to be a small experimental initiative, which the audit team recommends to be augmented and replicated for other official and residential units.

v. The audit team recognises the Eco Club of the college as one the most active and important component with respect to development of environmental management plan of the college. The extra-curricular environmental activities performed by the eco-club are —

- Plantation Programmes
- Environment Awareness Programmes
- Celebration of environmentally important days like- World water day, Earth day, Environment day, etc.
- Supplying bags to hostel boarders for shopping (to reduce polythene in the campus)

These activities are capable of building environmentally sensitive character of the students who can transform themselves as environmental stewards.

Table 9: Celebration of World Environment Day in different years

Sl. No.	Date	Initiative taken by	Locations
1.	05-06-2021 (World Environment Day)	College Eco Club & NSS unit	Student's own places (due to lockdown)
2.	05-06-2020 (World Environment Day)	College Eco Club & NSS unit	Student's own places (due to lockdown)
3.	05-06-2019 (World Environment Day)	College Eco Club & NSS unit	In adopted village of college
4.	05-06-2018 (World Environment Day)	College Eco Club & NSS unit	Student's own places
5.	05-06-2017 (World Environment Day)	College Eco Club & NSS unit	In adopted village of college

Table 10: Special Environmental activities in the year 2021

Name of the activity	**Organising unit/ agency/ collaborating agency**	**Name of the scheme**	**Year of the activity**	**Number of students participated in such activities**	**Reports of the event**	**Photographs**
World Environment Day	Lakhimpur Girls' College through NSS	World Environment Day on 5th June, 2021	2021	150	View/ Download	View/ Download
Cleanliness Drive	NSS, Lakhimpur Girls' College in collaboration with Nehru Yuva Kendra, North Lakhimpur	Clean India Programme	2021	30	View/ Download	View/ Download
Plastic and Waste Collection Drive	Lakhimpur Girls' College through NSS	Clean India Programme	2021	50	View/ Download	View/ Download
Special Village Camping Programme	Lakhimpur Girls' College through NSS	Special Camping Programme	2021	100	View/ Download	View/ Download

4. SUGGESTIVE MEASURES / RECOMMENDATIONS

i. The college should develop the campus as per a thorough land use planning utilising geo-informatics. In doing so, the college authority should try to maintain atleast 35-40% green cover including the botanical gardens, orchid house, wetlands and plantation across the campus. This will not only keep the green cover intact but help in reducing noise pollution, improving air quality and also provide residence for variety of faunal species.

ii. The college should emphasize on regular monitoring of drinking water quality since the college is dependent upon groundwater for drinking purpose. The audit team suggests the college authority to carry out testing of Iron, fluoride, arsenic and other heavy metals as a pre-emptive measure to rule out elevated levels of geogenic contamination above permissible limits. This is important in view of the available reports of CGWB reports and scientific research papers from this region with regards to contaminated groundwater.

iii. The college authority should take up steps for regular survey of flora and fauna of the campus and its surroundings. This activity should be made an annual event and include the participation of local citizens. The college can also prepare People's Biodiversity register through such activity.

iv. The college authority should establish a weather station on its own since it has a Geography department which will be very helpful for the students and the college in general. Further, the department can also collaborate with organisations like ASTEC, IMD, etc. to establish a continuous air quality monitoring station.

v. The college authority should invest in installing rainwater harvesting system across all the buildings and reduce its dependence upon groundwater.

vi. The college can utilise its organic wastes for composting and covert it to manure for utilisation in the gardening purposes.

vii. All the lights including that of the classrooms and offices should be converted to solar powered LED lights since the college has ample open space for installation solar panels. The college authority can also seek help from AEDA for installation and generation of grid connected rooftop solar power plant within the campus.

viii. Since the college has science departments that are capable of generating chemically and biologically hazardous wastes, therefore there should be an established mechanism of collecting such wastes and the same should be collected by authorised agencies as per prescribed protocols under the environmental rules.

ix. The college authority should try to develop programs to engage more students across all departments in various environmental activities apart from those who are cadres of NCC, NSS and members of Eco-clubs. Activities taken up by these units should continue and carried out regularly.

x. The college authority should set up an empowered cell/committee or entrust the IQAC for establishing rules and norms within the campus so as to comply with various rules implemented under the Environmental (Protection) Act, 1986 and its subsequent amendments.

5. CONCLUSION

Green Audit is one of the most efficient ways to identify the strength and weakness in strategies and approaches of making an organisation environmentally sustainable. Green audits can "add value" to the management approaches being taken by the college and is a way of identifying, evaluating and managing environmental risks (known and unknown). Green and environmental audit is one of the most important activities that comes under the NAAC assessment. It is a mandatory activity which can go a long way in making an educational institution truly sustainable. Based upon the data provided by the college authority, it can be apprehended that there is scope for further improvement, particularly in relation to management of water and energy resources as well as that of waste. The recommendations in this report highlight many ways in which the college can work to improve its actions and become a more sustainable institution.

ACKNOWLEDGEMENT

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