Green Audit and Energy Audit
OF
L.T.K. College, Azad, Lakhimpur

CERTIFICATE

This is to certify that the Green and Energy Audit of L.T.K. College, Azad, North Lakhimpur has been carried out by the team from Gauhati University, Guwahati-14 and L.T.K College under my supervision and guidance. This 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 and Energy Audit of the College.

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

26/05/2022

(Hari Prasad Sarma)

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GREEN AND ENERGY AUDIT

L.T.K. COLLEGE, AZAD, N. LAKHIMPUR, ASSAM 787031

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.PREFACE.

Green and Energy Audit in the Institutions of higher education is nowadays considered to be a very important aspect of self-assessment within the framework of National Assessment Accreditation (NAAC) process. In fact, NAAC has made it mandatory for all institutions of higher education to submit the Green and energy Audit report. Further, raising concerns about degrading quality of the environment and realizing the values of environment in a natural outcome of teaching-learning process in higher education institutes. Therefore, it becomes imperative that all such institutes should carry out a self-inquiry/assessment with regards to its contribution towards environmental sustainability. Green and energy Audit is a method of such self-inquiry adapted by various Colleges and Universities throughout India.

L.T.K. College, in its pursuit for maintaining and improving the wholesome environmental quality of its campus, has taken up an initiative of carrying out a self- assessment through Green and energy Audit with the following objectives:

(a) To establish a baseline of existing environmental condition

(b) To document the best protocol of environmental sustainability

(c) To promote environmental awareness through participatory auditing process and

(d) To generate a report based on the auditing process that would contain the baseline environmental data, best practices with regards to pollution control, waste management, energy conservation, biodiversity conservation and future strategies for achieving environmental sustainability.

The college authority in order to maintain transparency and avoid self-biasness had decided to entrust the department of Environmental Science, Gauhati University as an external expert agency to carry out the green audit of the college.

In absence of standardized model of Green and energy Audit of Institute of Higher Education (IHE) of state of Assam, a team consisting of members from the department of Environmental Science, Gauhati University and L.T.K College decided to carry out a rapid assessment through questionnaire method and standard field cum laboratory based environmental analytical methods.

The Green and energy Audit assessment team collected most of the data with the help of students, teachers and officials of the college. The field based environmental analyses were carried out with standardized portable monitoring kits available with the department of Environmental Science, Gauhati University. Other laboratory analyses were also carried out in the same department. Based on the database generated, the audit team has recommended some short- term and long-term suggestive measures which would be instrumental in improving the environment of the L.T.K. College campus.

It is hoped that this report will receive due attention of all the stakeholders of thecollege and help in bringing about a paradigm shift in the administrative policy of the college which will ultimately lead to environmental sustainability.

26/05/2022

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INTRODUCTION

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

Green and energy 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 and energy 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 canbe used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides 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 important 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 and energy 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 purpose of green audit is to upgrade 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. Many institutions undertake a lot of good measures to resolve the problems but are not documented due to lack of green documentation awareness. All this non-scholastic efforts of the administrations play an important role in ensuring the greenquotient of the campus is intact.

Green and energy 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.

The main objectives of carrying out Green and energy Audit are:

- To map the geographical location of the college.
- To document the floral and faunal diversity of the college
- To document the ambient environmental conditions of weather, air, water and noise in and around the college campus
- To document the waste disposal system
- To estimate the energy requirements of the college

2. OVERVIEW OF THE COLLEGE

L.T.K. College was established on the 22nd day of Aug.1977 at the initiative of the local people at the conjoining point of Lakhimpur, Telahi and Kamalabaria Mouzas and named accordingly as L.T.K. College. The missionary zeal, unflinching endeavor and sacrifice of some prominent local people and whole hearted devotion of some teachers and the management have brought the college to its present state of dignity. The Arts stream was brought under deficit grant-in-aid system in 1987.The college is permanently affiliated to Dibrugarh University and registered under 2(f) and 12 (b) U.G.C. Act.1956. With a view to imparting Science education among rural youths the science stream was started in 1994 and in keeping with agrarian economy of the locality a vocational subject " Industrial Fish and Fishery " was introduce in 1998 under U.G.C. scheme.

Though the college is situated in a rural and flood prone area, it is well connected by road from North Lakhimpur town and also from Panigaon. As the college is situated amidst green field, so the atmosphere of the college is calm and screen. Besides it is saturated with nature's bounty that provides peace and tranquility essential for an educational institution.

Table no: 1

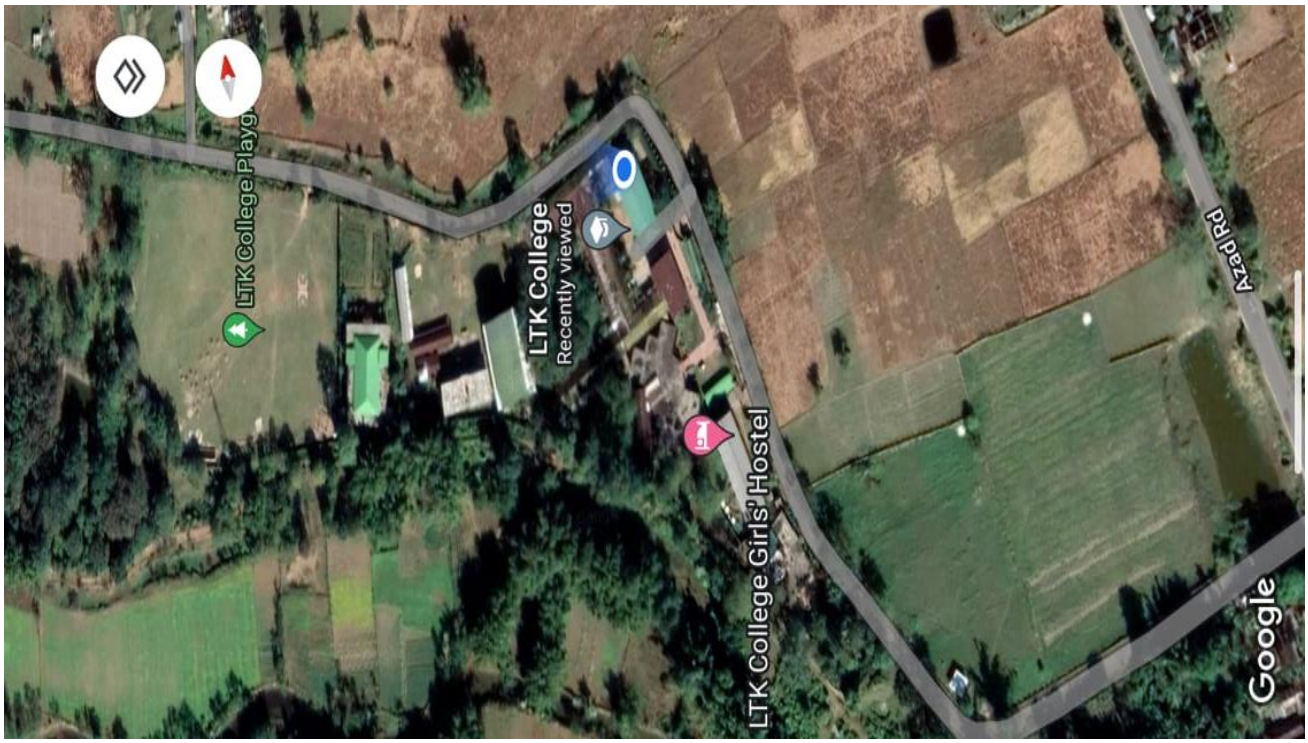
Total no of students	**UG**	1066
	PG	Nil
Total no. of teaching stuff	**Permanent**	48
	Temporary	20
Total no. of Non teaching stuff	**Permanent**	11
	Temporary	06

3. LAND USE

L.T.K. College has a total land holding of 69,524 square metres (52 Bigha) of which approximately 5348 square meters (4 Bigha) is classified as water bodies. Approximately 34,425 square meter of the total area can be classified as under green cover (Table 2). The presence of horticultural gardens and Botanical garden inside the campus augments the aesthetic value of the college. A brief note on the built-up environment of the college is provided below:

Built-up environment:

The total built-up area is approximately 3493 square meters out of the total 69,524 square meters of the campus. Since its inception, the college authorities have developed some part of its land holding for fulfilling the academic and administrative necessities of the college. Most of its built-up environment consists of concrete structures like classroom buildings, offices, library, etc.



Aerial view of L.T.K. College (Source: Google Earth)

Table No: 2

Land use category	Type	Area (square meter)
Built-up land		3493
Green cover	Botanical Garden	30085
	Ornamental Garden (Nos. 3)	2791
	Medicinal Garden	224
	Citrus Garden	1325
Water bodies	Ponds (Nos. 4)	7360
Roads	Pucca Road	278
	Kutcha Road	418
Drainage system		1515
Wasteland		7035
Unutilised road		15000
	Total	69,524

4. CAMPUS BIODIVERSITY

The landscape of L.T.K. College campus includes natural vegetation cover, Botanical garden, Orchidarium, Citrus plantation, Neem Plantation, Medicinal Plant Garden, Horticultural Garden and water bodies which provide a unique environmental setting conducive for a wide range of floral and faunal diversity. From the data collected from the college authority and team observations, it has been found that at least 19 species of birds (Table 3), 14 invertebrate species (Table 5), 7 species of reptiles (Table 6) and spiders, insects, butterflies, common animals are

found within the campus. Apart from these, there are 24 species of fishes (Table 4) distributed in the four ponds of the college. The lists of floral species (Table 7, Table 8, Table 9, Table 10 and Table 11) are provided below as per taxonomic categorization.

Table 3 : List of Avifauna

COMMON NAME	SCIENTIFIC NAME
Cattle egret	*Bubulcus ibis*
Common Crow	*Corvus splendens*
Cinnamon bittern	*Ixobrychus cinnamomeus*
White breasted waterhen	*Amaurornis phoenicurus*
Common Myna	*Acridotheres tristis*
House Sparrow	*Passer domesticus*
Jungle Myna	*Acridotheres fuscus*
Red-vented Bulbul	*Pycnonotus cafer*
Yellow Wagtail	*Motacilla flava*
Grey Wagtail	*Motacilla cinerea*
White Wagtail	*Motacilla alba*
Coppersmith Barbet	*Megalaima haemacephala*
Blue throated Barbet	*Megalaima asiatica*
Jungle Babbler	*Turdoides striatus*
Flycatcher	*Unidentified*
Yellow footed green Pigeon	*Treron apicauda*
Spotted Dove	*Spilopelia chinensis*
Pied Myna	*Sturnus contra*
Oriental Magpie Robin	*Copsychus saularis*

Table 4 : List of Fish species

FAMILY	SPECIES
Cyprinidae	*Labeo rohita*
	Labeo bata
	Catla catla
	Cirrhinus mrigala
	Hypopthalmichthys molitrix
	Cyprinus carpio
	Puntius sophore
	Puntius gelius
	Chela laubuca
	Amblypharyngodon mola
	Esomus danricus
	Rasbora daniconius
	Brachydanio rerio
Cobitidae	*Lepidocephalichthys guntea*
Claridae	*Clarias magur*
Heteropneustidae	*Heteropneustes fossilis*
Ambassidae	*Chanda nama*
Nandidae	*Nandus nandus*
Gobidae	*Glossogobius giuris*
Belontidae	*Colisa fasciatus*
Channidae	*Channa punctatus*
Tetraodontidae	*Leiodon cutcutia*
Notopteridae	*Notopterus chitala*
Siluridae	*Wallago attu*

Table 5 : List of Invertebrate species

Sl. No.	COMMON NAME	SCIENTIFIC NAME
1	Wild big honey bee	*Apis dorsata*
2	Indian medium honey bee	*Apis indica*
3	Small Indian honey bee	*Apis florae*
4	Hybrid Indo-European honey bee	*Apis mellifera indica*
5	Big hornet wasp	*Vespa tropica*
6	Hornet wasp	*Vespa orientalis*
7	Yellow dragonfly	*Diplacodes trivialis*
8	Yellow dragonfly	*Potamarcha congener*
9	Red-veined darter dragonfly	*Sympetrum fonscolombii*
10	Cabbage butterfly	*Pieris rapae*
11	Common tiger butterfly	*Danaus genutia*
12	Common grass yellow butterfly	*Eurema hecabe*
13	Mottled emigrant butterfly	*Catopsilia pyranthe*
14	Yellow garden spider	*Argiope aurantia*

Table 6: List of Reptile species

Sl. No.	Common Name
1	Brahmini blind snake
2	Diards blind snake
3	Buff-Stripped keelback
4	Copper headed trinket snake
5	Indian rat snake
6	Checkered keelback
7	Banded krait

Table 7 : List of floral species

Sl. No	Botanical Name	Common Name
1	*Mimusops elengi*	Bokul
2	*Delonix regia*	Krishnosura
3	*Messua ferrea*	Nahar
4	*Azadirachta indica*	Mahanim
5	*Phyllanthus emblica*	Aamlakhi
6	*Alstonia scholars*	Ahot
7	*Zizyphus jujuba*	Bogori
8	*Nyctanthes arbortristis*	Hewali
9	*Polylthia longifolia*	Devadaru
10	*Tectona grandis*	Segun
11	*Terminalia arjuna*	Arjun
12	*Lagerstrsemia flos-raginae*	Ajar
13	*Terminalia chebula*	Xilikha
14	*Psidium guajava*	Guava
15	*Dillenia indica*	Outenga
16	*Acacia auroculiformis*	Acacia
17	*Elaesoarpus floribundus*	Jalfai
18	*Sapindus mukorossi*	Monisaal
19	*Melia azedarach*	Ghura Neem
20	*Cordia grandis*	Bual
21	*Terminalia bellirica*	Bhumura
22	*Tamarindus indica*	Teteli
23	*Syzygium cumini*	Kolajamu
24	*Spondias dulcis*	Amora
25	*Averrhoa carambola*	Kordoi
26	*Mangifera indica*	Aam
27	*Bombax ceiba*	Simolu
28	*Cocos nucifera*	Narikol

29	*Murraya koenigii*	Noroxingha
30	*Syzygium jambos*	Bogijamu
31	*Phyllanthus acidus*	Pora aamlakhi
32	*Heteropanax fragrans*	Keseru
33	*Dalbergia sissoo*	Sissoo
34	*Terminalia nudiflora*	Veleu
35	*Cinnamomum verum*	Dalchini
36	*Ficus glomerata*	Dimoru
37	*Alstonia scholaris*	Sotiyana
38	*Cassia fistula*	Hunaru
39	*Gmelina arborea*	Gamari
40	*Vitex negundo*	Posotiya
41	*Strablus asper*	Houra
42	*Bauhinia variegata*	Kanchan
43	*Bambusa tulda*	Bamboo
44	*Araca cathecu*	Tamul
45	*Clerodendrum colebrookianum*	Nefafu
46	*Musa paradisiacal*	Kolgos
47	*Erythrina variegate*	Modar
48	*Hibiscus mutabilis*	Sthalapadma
49	*Citrus limon*	Nemu tenga
50	*Terminalia myriocarpa*	Holokh

Table 8: List of flower varieties cultivated in the ornamental garden

Sl. No.	Name of the Plant
1	*Chrysanthemum sp.*
2	*Dahlia sp.*
3	*Dianthus sp.*
4	*Viola tricolor* (Pansy)
5	*Calendula sp.*
6	*Rosa sp*. (Rose)
7	*Antirrhinum sp.* (Dog flower/Snapdragon)
8	*Petunia sp.*
9	*Tagetes sp*. (Marigold)
10	*Chrysopogon sp.*
11	*Portulaca sp.*
12	*Ixora sp.*
13	*Coleus sp.*
14	*Dracaena sp.*
15	*Bougainvillea sp.*
16	*Hibiscus rosa sinensis*
17	*Helianthus sp*. (Sun plant)
18	*Hiptage sp.* (Madhabilota)
19	*Duranta repens*

Table 9: Medicinal Plants in College campus

A medicinal plant garden is established in 2014 and a total of 65 numbers of medicinal plants are now available in the garden.

Sl. No.	Common Name/Local Name	Scientific Name
1	Bach	*Acorus calamus*
2	Halodhi	*Curcuma longa*
3	Nephaphu	*Clerodendrum colebrookianum*
4	Jamlakhuti	*Costus specious*
5	Dhatura	*Datura metel*
6	Padina	*Mentha viridis*
7	Man Dhania	*Ranunculus seleratus*
8	Masandari	*Ranunculus reniformis*
9	Nilaji ban	*Mimosa pudica*

10	Xuklati	*Pogostemon benghalensis*
11	Jaluk	*Piper nigrum*
12	Tejpat	*Cinnamomum tamala*
13	Kola Tulokhi	*Ocimum sanctum*
14	Ada	*Zingiber officinalis*
15	Hati Vekuri	*Solanum torvum*
16	Vekuri	*Solanum indicum*
17	Nayantora	*Vinca rosea*
18	Sagarfena	*Ountia dillenei*
19	Brahmi	*Bacopa moneri*
20	Bormanimuni	*Centella asiatica*
21	Horumanimuni	*Centella japonica*
22	Baga Bahaka	*Adhatoda vasica*
23	Tita Bahaka	*Phlogo Canthus thyrsiflorus*
24	Bikhalya karoni	*Justicia gendarussa*
25	Matikothal	*Ananus comosus*
26	Vedailota	*Paederia foetida*
27	Bhut Jolokia	*Capsicum chinense*
28	Khohota Dimoru	*Ficus hispidia*
29	Tikoni Barua	*Smilax zeylanica*
30	Amita	*Carica papaya*
31	Kamala tenga	*Citrus reticulata*
32	Gul Nemu	*Citrus aurantifolia*
33	Dal Chini	*Cinnamomum zeylanicum*
34	Bogi Jamu	*Eugenia praecox*
35	Elachi	*Elettaria cardamomum*
36	Tengamora	*Hibiscus sabdariffa*
37	Gadhuligupal	*Mirabilis jalapa*
38	Bangali aera	*Jatropha curcus*
39	Laijabori	*Drymeria cordata*
40	Durunbon	*Leucus aspara*
41	Gundhuwabon	*Ageratum conyzoids*
42	Sal Kunwori	*Aloe barbadensis*
43	Khorpat	*Cassia alata*
44	Sirota	*Andrographis paniculata*
45	Siju	*Euphorbia neriifolia*
46	Dahi kasu	*Alocasia odora*
47	Kon Jolokia	*Capsicum frutescens*
48	Gathion	*Kaempseria rotonda*
49	Letaguti	*Caesalpinia bonducella*
50	Kolakasu	*Colocasia esculenta*
51	Jetuka	*Lawsonia alba*
52	Bonmula	*Callicarpa arborea*
53	Aamlakhi	*Phyllanthus emblica*
54	Pasatia	*Vitex negundo*
55	Akon	*Calotropis procera*
56	Outenga	*Dillenia indica*

57	Medelua	*Cassia sophera*
58	Tarua Kadam	*Acacia arabica*
59	Parijat	*Canna indica*
60	Nilakantha	*Thunbergia grandiflora*
61	Harjora	*Vitis quandragularis*
62	Arjun	*Terminalia arjuna*
63	Duportenga	*Bryophylum pinnatum*
64	Xilikha	*Terminalia chebula*
65	Bhumura	*Terminalia belerica*

Orchidarium:

A beautiful orchid house with 40 numbers of orchids is established in April 2016. A total of 34 epiphytic species and 4 terrestrial species are planted collected from nearby three reserve forests i.e. Dulung, Kakoi and Ranga reserve forest of Lakhimpur district of Assam during 2014-2016. The purpose of making an orchidarium in Botany Department, L.T.K. College is to collect and conservation of different beautiful orchids. Also to enumerate the orchid species present above three reserve forests and to study the ethnobotanical importance of different orchid species.

Table 10: List of Epiphytic Orchid species

Sl. No.	Scientific Name
1	*Acampe papillosa*
2	*Acampe rigida*
3	*Acampe sp.*
4	*Aerides multiforum*
5	*Aerides odoratum*
6	*Bulbophyllum crassipes*
7	*Bulbophyllum auratum*
8	*Bulbophyllum carryanum*
9	*Cleisocentron trichomum*
10	*Cleistoma sobulatum*
11	*Cymbidium aloifoliumm*
12	*Cymbidium pendulum*
13	*Dendrobium aduncun*
14	*Dendrobium aphyllum*
15	*Dendrobium eriaeflorum*
16	*Dendrobium fimbriatum*
17	*Dendrobium lituiflorum*
18	*Dendrobium moschatum*
19	*Dendrobium nobile*
20	*Eria ferruginea*
21	*Eria fragrans*
22	*Eria lasiopetala*
23	*Eria pubescens*
24	*Flickingeria macraei*
25	*Liparis viridifolia*

26	*Lusia zeylanica*
27	*Micropera rostrata*
28	*Oberonia iridifolia*
29	*Papilionanthe teres*
30	*Phloidota articulata*
31	*Phloidota griffithii*
32	*Phloidota padilla*
33	*Rhyncostylis retusa*
34	*Stereochilus hirtus*

Table 11: List of Terrestrial Orchid species

Sl. No.	Scientific Name
1	*Arundina graminifolia*
2	*Malaxis latifolia*
3	*Phaius tankervilleae*
4	*Spathoglotis plicata*

5. DRINKING WATER QUALITY

Table 12: Water quality data

Sample sites	Sample ID	pH	TDS (ppm)	Tem (C)	ORP (mV)	EC (µs)	Salinity (ppm)	TH (mg/L)	Fe (ppm)	PO_4^{3-} (ppm)	NO_3^- (ppm)	SO_4^{2-} (ppm)	F^- (ppm)	Cl^- (ppm)
Chem. Dept	S-1	6.08	220.3	19.0	136.8	479.2	490.0	194	0.06	0.51	7.87	14.62	0.54	69.97
Girl's hostel	S-2	6.10	221.4	22.0	190.2	221.1	270.5	169	0.06	0.54	8.45	14.9	0.56	70.26
Pond	S-3	7.50	223.4	24.7	84.9	225.0	218.7	144	0.91	0.18	28.4	15.12	0.58	79.97
Botany dept.	S-4	6.04	276.2	19.8	169.2	381.4	380.7	184	0.06	0.68	7.66	13.53	0.53	81.99
Water tank	S-5	6.10	375.5	20.0	132.8	220.5	336.5	126	1.19	0.77	40.41	15.89	0.57	71.99
Pond	S-6	7.62	370.4	24.0	71.5	172.5	167.8	166	0.91	0.34	7.12	15.03	0.49	74.92
College canteen	S-7	6.65	273.3	22.3	138.3	492.2	494.0	182	0.09	0.19	5.97	14.73	0.62	73.15

Water quality of L.T.K. College analyses were carried out on samples collected from 7 numbers of sites. The water quality analyses were carried out for 13 parameters (pH, TDS, Temperature, ORP, Conductivity, Salinity, Total hardness, Fe, PO_4^{3-}, NO^-, SO^{2-}, F^- and Cl^-) and as per standard procedures prescribed by APHA (1984). Onsite analyses of certain parameters were carried out using a portable water analysis kit (Eutech PCD 670 model). Analyses of other parameters were carried out in the laboratory of the Department of Environmental Science, Gauhati University. The water analyses reveal that the tested water parameters were well within the permissible limits for drinking water as set by the WHO.

6. WATER USE AND CONSERVATION

The college campus has a total of 8 numbers of water reservoirs which can store a totalamount of 10,000 litres of water as detailed below:

Table 13:

Tank No	Location	Capacity (Lit)
1	Administrative building (1nos.x 1000 l)	1000 Lit.
2	College Library (1nos. x 1000 l)	1000 Lit.
3	Guest House (2nos.x 1000 l)	2000 Lit.
4	Girls Hostel (2 nos. x 1000 l)	2000
5	General Reservoir (1nos. x 2000 l)	2000
6	Canteen (1nos. x 500 l)	500
7	Multipurpose Gym (1 nos. x 1000 l)	1000
8	Boys Hostel (1nos. x 500 l)	500

It has been observed that the college has been installed the Rain water harvesting plant in the new building (front side) of the Multi-Purpose Gymnasium. The plant has been constructed roof from 20 feet by PVC pipe (3nos×4inch diameter×20 inch) for law fall rain water into 1000 liter capacity tank in the ground. The harvesting water used for gardening and other uses.

7. AMBIENT NOISE LEVEL

The noise level measurements were carried out within the college at 8 different sites using a portable noise level meter. The noise levels as detected at different locations are tabulated as follows:

Table 14: Noise levels in different sites of the college campus

Sl. No.	Site Name	Sound Pressure (dB)	L_{eq}
1	New Building	53.1	55
2	Library	45.1	45.5
3	Girls' common room	47.1	60.2
4	Backside of Auditorium	45.1	46.5
5	Boys' common room	48.1	50.6
6	Botany Lab	50.5	57.6
7	College Main gate	45.1	63.2
8	College canteen	55.1	57.5

Except for the auditorium and Library, all other locations had noise level above the permissible limit of 50 dB.

College has been observed specially No Horn Day and License checking, Helmets Checking etc. in every year part of a motor vehicle week.

8. CAMPUS WASTE MANAGEMENT

Collection and removal of solid within the college campus is dumped in low-lying areas which is 0.5 km from the main college building. About 90% of solid wastes (viz. plastics, plastic packages, decomposed leaves, dung of animals, empty containers of chemicals, Cardboard used for practical purposes are burnt to ashes which are used for plantation and the rest 10% Garbage's (viz. broken glasses, remnants of building, unused tin used, batteries, oil, tyres etc.) are picked up by some rag pickers of nearby communities on payment. During Segregation of solid wastes the decomposed part of the garbage's are transformed into compost which are later used for plantation.

The site for solid waste disposal is checked to verify permeability so that contaminants percolate into the ground water or nearby places. Intensive programmes of tree plantation on solid waste disposal site are undertaken. Efforts are made to recover the solid waste materials to the extent possible. Human settlements are kept away from the solid waste dumping sites. The pattern of filling disposal site for solid waste site are planned to create better landscape and the solid waste are disposed according to the approved plane. Landfill site are protected to prevent entry of stray animals. The site is situated at least 0.5 km away from the main college. But free flow road facilities are made to carry the waste. Prior to the commencement of monsoon season, an immediate cover of 40-50cm thickness of soil are placed on the landfill to prevent infiltration during monsoon. After completion of landfill a final cover are designed to minimize infiltration and erosion.

Manual handling of waste are prohibited. Storage facilities are done either in "bins" or on ground or on a mechanized container. Maximum percentages of wastes are burnt to ashes and these ashes are used in plantation. The compost from solid waste is completely a biological process. Segregation of solid wastes is undertaken. The anaerobic degradation of leaves, refuse, animal dung are placed in pits. This process took at least six months to use usable compost. Rag pickers from local communities on payment are called to remove the solid waste.

9. CAMPUS CLEANLINESS

College has been organized different types of cleanless programme through L.T.K. College Eco club, Green L.T.K. Clean campus cell, NSS, NCC etc in different observation day and need based of college garbage deposition. There are two cleanless activities cum workshop mention below:

Programme 1: workshop on E waste management

Lakhimpur Telahi Kamalabaria College in association with AInA Welfare Foundation has started a project on E-Waste management. The project has started on 8th April 2022 followed by 4 days' workshop and awareness campaign. The electronic waste are different than ordinary wastes and more harmful to the living being as well as environment, as it contains toxic pollutants like Mercury, Led, Cadmium, Chromium and Plastics. According to a 2015 study by Toxic Link, a Delhi based environmental NGO, Assam is the sixth largest e waste producing state in India which estimated to produced nearly 14,000 tones of e-waste every year. E- waste is speedily becoming a threat for the whole country because of lake of awareness among people. To reduce the alarming issue, the project has planned for mass awareness among students, provide training to repair, recycle and re use electronics and set up E-waste Collection Centre in college premise.

Programme 2:

College had organized one day celebration in 16/03/2021 Clean less programme under green L.T.K. Clean campus cell. The programme inaugurated by principal of L.TK. College and delivered speech about environmental sustainability and hygiene among students.

There are altogether 30 students in participation in this programme under Green L.T.K. Clean Campus cell.

10. ENERGY REQUIREMENT AND MANAGEMENT

Implementing energy saving techniques is ensured that the lights and fans are switched off by floor peons and staff after completion of the last lecture of the day. Classrooms are made with sufficient cross ventilation and light so that the use of electricity can be minimized.

Table: 15

Equipment	Quantity	Approx. per day consume energy	Total (Watt)
Tube Bulbs	10	40w x 10	400w
A/C	05	1.5 kw x 5	75w
LED Projector	05	150w x 5	750w
Photocopier	03	1kw x 3	3000w
Computer printers	09	300w x 9	2700w
Computers	40	250w x 40	10000w
LEDs	55	18w x 55	990w
Fans	300	100w x 300	30000w
Motor	09	250w x 9	2250w
Freeze	04	250w x 4	1000w
Aqua guard	06	25w x 6	150w
Electric Kettle	14	1kw x 14	14000w
			65,315 watt

From the above chart it is clear that maximum connected load is in the college campus consisting of all the class rooms, auditorium hall, practical lab, computer lab, canteen, Distance education, DBT Hub, Conference Halls, Multipurpose gym, Indoor Stadium, Volleyball court etc. In these areas there are altogether 300 fans which are drawing maximum connected load and about 40 computers drawing a considerable amount of load. Moreover, there are four AC motor pumps of rating which are also drawing maximum of connected load. Street light load are alternative source of solar energy.

11. BEST ENVIRONMENTAL PRACTICES

Table: 16

Sl. No.	Date	Initiative taken by	Locations
1	05/06/2016	Green L.T.K. clean campus forum, L.T.K College Eco club, NSS unit	L.T.K. College in and out campus
2	05/06/2017	Green L.T.K. clean campus forum, L.T.K College Eco club, NSS unit	L.T.K. College in and out campus
3	05/06/2018	Green L.T.K. clean campus forum, L.T.K College Eco club, NSS unit	L.T.K. College in and out campus
4	10/06/2018	Neem tree plantation in collaboration with Eco club	L.T.K. College in and out campus
5	16/09/2018	World Ozone day celebration with Eco Club Green	L.T.K. College in and out campus

6	05/06/2019	L.T.K. clean campus forum, L.T.K College Eco club, NSS unit	L.T.K. College
7	05/06/2020	Green L.T.K. clean campus forum, L.T.K College Eco club, NSS unit	L.T.K. College in and out campus
8	05/06/2021	Green L.T.K. clean campus forum, L.T.K College Eco club, NSS unit	L.T.K. College in and out campus

Sl. No.	**Date**	**Initiative taken by**	**Locations**
1	01/06/2018	Celebration World Environment Day at L.T.K. College in association with Asom Sahitya Sabha	L.T.K. College
2	16/09/2018	World Ozone day celebration with Eco Club Green	L.T.K. College in and out campus
3	01/06/2019	Health awareness cum check up camp organized by NSS unit & Extension activity committee in collaboration with Red cross society, Lakhimpur	Kotohaguri M.E. School, Azad, Lakhimpur
4	05/06/2019	World Environment Day celebration organized by Eco club, L.T.K. College	L.T.K. College
5	17/03/2020	Health Awareness Programme	Azad, North Lakhimpur
6	05/06/2020	World Environment Day celebration organized by Eco club, L.T.K. College	L.T.K. College
7	04/03/2021	Organized Health camp	Majulial Gaon, Lakhimpur
8	05/06/2021	World Environment Day celebration organized by Eco club, L.T.K. College	L.T.K. College
9	08/07/2021	“Environmental degradation and sustainable development in modern era” organized by department of Economics in collaboration with IQAC	L.T.K. College
10	21/07/2021	Webinar on “The story of water and life on Earth” organized by Department of Chemistry , L.T.K. College in association with IQAC	L.T.K. College
11	02/10/2021	Cleaning drive by L.T.K. College NCC unit on the occasion of Gandhi Jayanti	L.T.K. College
12	26/12/2021	Cleanliness programme drive by NCC girls, Green L.T.K. Clean Environment	Boginodi Soil, Lakhimpur
13	09/02/2022	Eco environmental camp by NSS unit, L.T.K. College	Balibheta H.S. School, Lakhimpur
14	22/02/2022	Observation of National Science Day on the topic “Integrated approach in science and technology for sustainable future” by Eco	L.T.K. College

		club L.T.K. College, Zoological society of Assam	
15	04/03/2022	World Wildlife day celebration organized by dept Zoology association with dept. of Chemistry	L.T.K. College
16	22/03/2022	Webinar on "World Water Day" organized by dept of Chemistry L.T.K. College, Chief guest Dr. Hariprasad Sharma.	L.T.K. College
17	10/04/2022	"Awareness camp cum hands on training E-Waste management" organized by L.T.K. College Eco club collaboration with InA foundation.	L.T.K. College
18	28/04/2022	Webinar cum hands on workshop on "Study of climate parameters and their changes over North East India" organized by Dept. of Physics in association of IQAC, L.T.K. College	L.T.K. College

Photo Gallery of LTK College Eco-Club Activities

National Science Day Celebration at LTK College,2019

Ozone Day Celebration at LTK College, 2018

World Environmental Day Celebration at LTK College, 2019

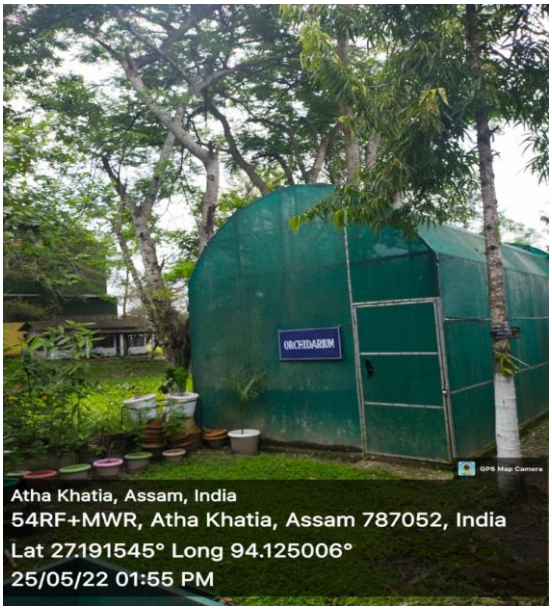
Participants at National Science Day Celebration programme at LTK College, 2019

Neem tree plantation by Eco Club with collaboration from LTK college, 2018

Garbage collection of College campus:

Solar light panel in the College campus:

Ponds in College campus



Orchidarium

Ornamental Garden of our college

Medicinal Garden

Photographs of a few bird species found in L.T.K. College campus

Photographs of a few reptiles species found in L.T.K. College campus

Few snapshots of the college campus

12. SUGGESTIVE MEASURES

1. The college authority should implement rainwater harvesting structure as soon as possible and for that the built-up environment of the college can be effectively utilized.
2. The college should maintain the existing green cover and increase if possible through expansion of botanical gardens and other such measures utilizing unused land in hand.
3. The college authorities should take up pro-active steps in establishing a real time monitoring air quality monitoring station which can be carried out in collaboration with Govt. institutes like IITM-Pune or CPCB/SPCB. In lieu of this, the Department of Chemistry & Physics can collaboratively establish an air quality station independently under the guidance of environmental experts.
4. The college authorities can install more solar power alternatives for minimizing the cost of usage of conventional electricity.
5. The issue of solid waste is being seriously taken up by the college authorities. However, the authority should maximize the installation of colour coded bins as per directives of SPCB/CBCB is needed.
6. As far as e-wastes are concerned, the college should maintain an asset register of such wastes and scrapping must be done only through SPCB authorized agencies.
7. The college should emphasize on regular monitoring of drinking water quality, air quality and ambient noise level within the campus.
8. The College authority should install machinery tools for disposal of sanitary napkins for the benefit of female students (both residential and non-residential students)
9. The College authority should increased the safe drinking facilities for all seeing the growing numbers of students.
10. The College authority should opt for power save module for saving consumption of energy in the college campus.

Data Sources:

1. Land-use data, flora-fauna assemblage data, student enrolment and staff data, water usage, electricity data – collected from L.T.K. College authority.
2. Water quality, Noise data – Primary data generated by Department of Environmental Science, Gauhati University.

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26/5/22

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