GREEN AUDIT REPORT

2017-2018

DARRANG COLLEGE, TEZPUR, ASSAM

INTERNAL QUALITY ASSURANCE CELL (IQAC)

Editor-in-Chief

Dr. Joysankar Hazarika, Principal Darrang College

Editors

Dr. Bidhan Borah, P.G. Department of Botany

Dr. Chittaranjan Baruah, P.G. Department of Zoology

2018

Green Audit Assessment Team

Dr. Bidhan Borah, P.G. Department of Botany

Dr. Chittaranjan Baruah, P.G. Department of Zoology

Dr. Hemanta Jyoti Nath, P.G. Department of Geography

Dr. Satyendra Hazarika, P.G. Department of Geography

Dr. Palashmoni Saikia, Department of Chemistry

Dr. Saiful Islam, Department of Physics

Mr. Rishi Das, M.Sc. 3rd semester, Department of Zoology

Mr. Dadul Kalita, Technical Assistant

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INTRODUCTION

Green 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 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. 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 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.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric carbon-di-oxide from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) 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.

OBJECTIVES:

In recent time, the Green Audit of an institution has been becoming a paramount important for self assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since its inception. But the auditing of this non-scholastic effort of the college has not been documented. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

1. **To map the Geographical Location of the college**
2. **To document the floral and faunal diversity of the college.**
3. **To record the meteorological parameter of Tezpur where college is situated.**
4. **To estimate the Energy requirements of the college**

5. **To document the Waste disposal system**
6. **To document the ambient environmental condition of air, water and noise of the college**
7. **To introduce and aware students to real concerns of environment and its sustainability**

METHODOLOGY:

The purpose of the green audit of Darrang College is to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The methodology include: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. Some data have also been taken from the students' research works carried out by various science departments of the college.

ABOUT THE COLLEGE

Established in 1945 by the people of Tezpur, Darrang College was permanently affiliated to Gauhati University in 1953. With the motto of "Be a Jewel among men", it has been uninterruptedly working for fruitful dissemination of knowledge to its pupils with the solemn aim of making them worthy citizens of the country. The claim has been vindicated by a large number of alumni glittering in the national and international arena. Darrang College has an adequate academic and physical infrastructure catering to the 25 subjects in the 10+2 and Under Graduate Classes. Darrang College has regular PG courses in 4 departments Assamese, Zoology, Botany and Geography under Gauhati University.

VISION & MISSION VISION STATEMENT:

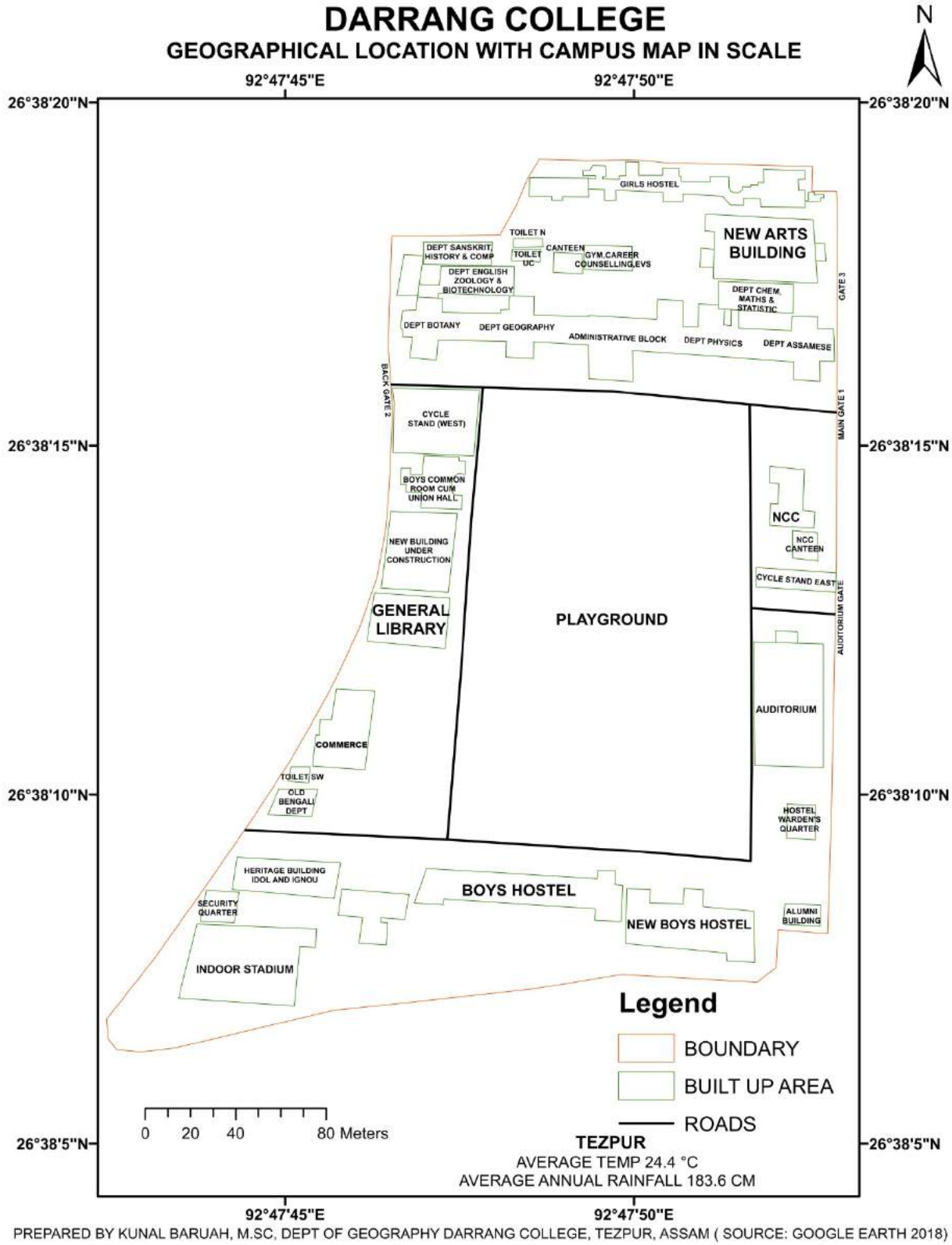
Darrang College stand firm to reach the top among the best institutions of the country by generating fruitful social, economic, cultural and human resources through promotion of quality education and thus to mould the society cope with changing need of time

GREEN AUDITING

The college has adopted the 'Green Campus' system for environmental conservation and sustainability. There are main three pillars i.e. zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO_2 emission, energy and water use, while creating atmosphere where students can learn and be healthy.

OBSERVATIONS

GEOGRAPHICAL LOCATION WITH CAMPUS MAP IN SCALE



PREPARED BY KUNAL BARUAH, M.SC, DEPT OF GEOGRAPHY DARRANG COLLEGE, TEZPUR, ASSAM (SOURCE: GOOGLE EARTH 2018)

LAND USE ANALYSIS, DARRANG COLLEGE, TEZPUR, ASSAM (As on 29-10-2018)

GENERAL OVERVIEW OF THE CONCEPT OF LANDUSE:

Land use refers to man's activities and the various uses which are carried on and derived from land. Viewing the earth from space, it is now very crucial in man's activities on natural resource. In situations of rapid changes in land use, observations of the Earth from space give the information of human activities and utilization of the landscape (Howarth 1981).
Remote sensing and GIS techniques are now providing new tools for advanced land use mapping and planning. The collection of remotely sensed data facilitates the synoptic analyses of earth system, functions, patterning, and change in the local, regional as well as at global scales over time .Satellite imagery particularly is a valuable tool for generating land use map.

METHODOLOGY ADOPTED FOR LAND USE MAPPING

Three types of data that are Gps points, field survey data and Google earth data for Georeferencing have been used in this study. Land use map of the study area have been prepared using the above three types of data with the help of ArcGis 10.2.2 software

DATA PROCESSING AND ANALYSIS

Land use map preparation is executed through the following steps:

Acquisition of data, Geo-coding and Georeferencing of satellite imageries by extracting the ground control points. Supervised classification was carried out with the aid of ground truth data collected during field survey. Scanning and digitization of maps and editing of all the Georeferenced maps were done using GIS. Data manipulation and analysis and linking the spatial data with the attribute data for creation of topology was carried out using GIS software. Creation of GIS output in the form of land use map showing various land use have been prepared.

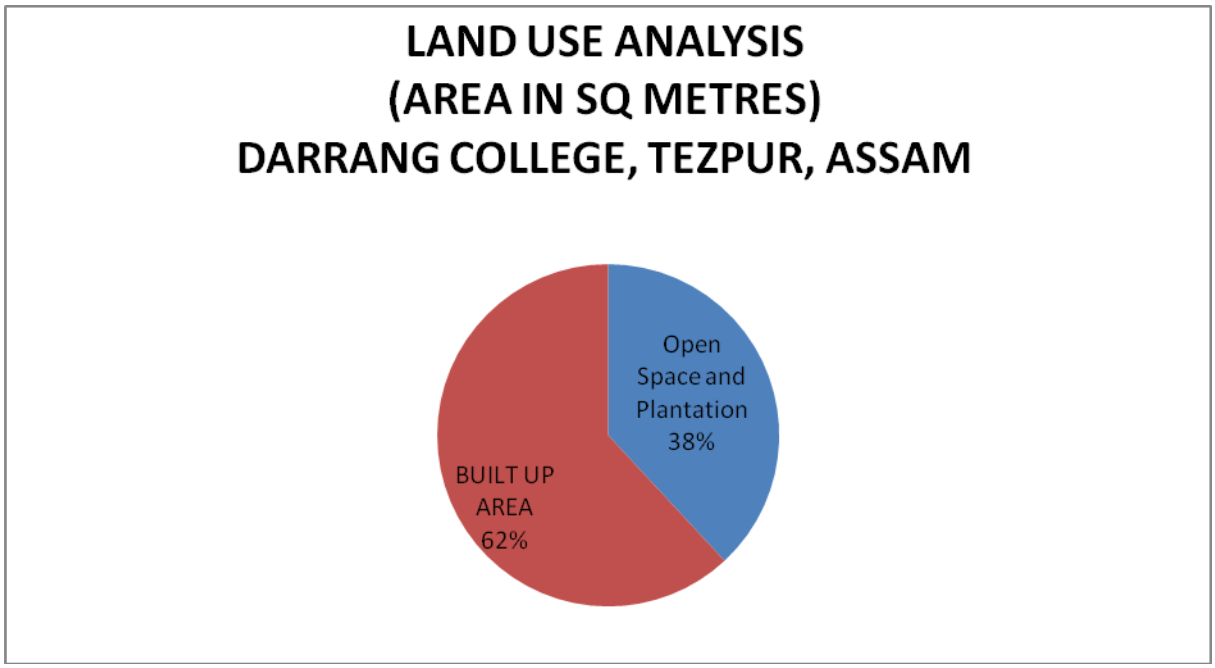
CLASSIFICATION SCHEME FOR LAND USE ANALYSIS OF BUILT UP AREA

Level I	Level II
1.Built-up land area	1.1 Dense 1.2 Moderate 1.3 Sparse

Therefore, attempt has been made in this study to map land use for Darrang College, Tezpur, Assam with a view to detect the land consumption in the built-up land area using both remote sensing and GIS techniques.

LAND USE DATA OF DARRANG COLLEGE, TEZPUR, ASSAM

CATEGORIES OF LAND USE	AREA IN SQ METRES
OPEN SPACE AND PLANTATION	23892.91
BUILT UP AREA	38834.36
TOTAL AREA	62726.27

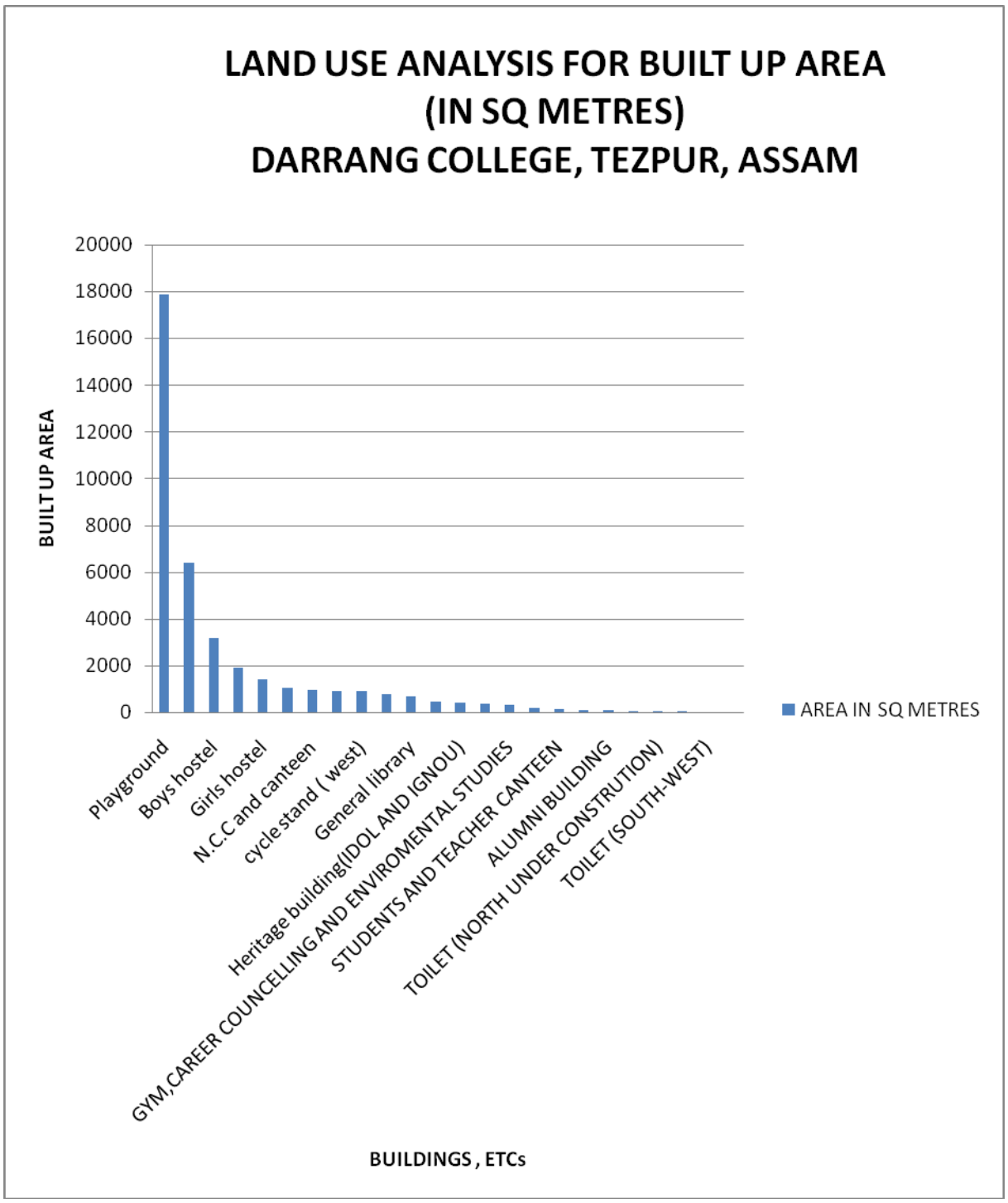


The total area of Darrang College is 62726.27 sq metres out of which the built up area is 62% (i.e 38834.36 sq meters) and open space & plantation area is 38% (i.e 23892.91 sq metres).

LAND USE (BUILT UP AREA) ANALYSIS:

CATEGORIES OF LAND USE (BUILT UP AREA)	**AREA IN SQ METRES**
PLAYGROUND	17884.72
MAIN FACULTY BUILDING WITH ADMINISTRATIVE BLOCK	6421
BOYS HOSTEL	3178.68
NEW ARTS BUILDING	1927.96
GIRLS HOSTEL	1437.94
AUDITORIUM	1083.74
N.C.C AND CANTEEN	964.06
INDOOR STADIUM	949.32

CYCLE STAND (WEST)	936.97
NEW BUILDING UNDER CONSTRUCTION	785.87
GENERAL LIBRARY	700.39
COMMERCE BUILDING	484.56
HERITAGE BUILDING(IDOL AND IGNOU)	429.10
BOYS COMMON ROOM CUM UNION HALL	391.05
GYM,CAREER COUNSELLING AND ENVIROMENTAL STUDIES	354.37
CYCLE STAND (EAST)	207.75
STUDENTS AND TEACHER CANTEEN	148.95
SECURITY QUATER	141.65
ALUMNI BUILDING	119.87
OLD BENGALI DEPT (PART OF OLD ARTS BUILDING)	81.19
TOILET (NORTH UNDER CONSTRUTION)	61.87
BOYS HOSTEL WARDEN'S QUARTER	60.15
TOILET (SOUTH-WEST)	52.10
TOILET (NORTH)	30.10
TOTAL	38834.36



The built up area of 62% (i.e 38834.36 sq metres) consists of the following regions as stated below for land consumption in built up area of Darrang college :

The northern region of Darrang College is densely built up having Main faculty Building with Administrative blocks, New Arts Building, Girls hostel, Gym, career counselling, Environmental

studies centre, Students and Teachers Canteen, North Toilet and the newly under construction North Toilet which results in 10382.19sq metres of built up area. The central region having playground sums up to 17884.72 sq metres of built up area and also falls in the densely built up area region of the college. The eastern region is sparsely built up having N.C.C Block and canteen, East stand, Auditorium and Boys hostel wardens' quarter which results in 2315.7 sq metres of built up area.The southern region and the western region of Darrang College is moderately built up having Heritage building (IDOL AND IGNOU), Security quarter, indoor stadium, Boys hostel and Alumni building towards south which results in4818.62 sq metres and West stand, Boys Common room cum UNION HALL, New building under construction, General library, Commerce building, Toilet (SOUTH WEST) AND old Bengali dept towards west results in 3432.13 sq metres.

FINDINGS:

Darrang College, which was established in the year 1945, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Its land use is such that about 38 % of the total area is occupied by open land and plantation that generates a better and sustainable campus environment.

The Land use analysis Report prepared by : Kunal Baruah, M.Sc, Geography, under the supervision of Dr. HJ Nath & Dr. S. Hazarika, Faculties of the department of Geography, Darrang College, 2018

TREE DIVERSITY OF DARRANG COLLEGE, TEZPUR

Darrang College is within the geo-position between latitude 26.6528^0 N and longitude 92.7926^0 E in Tezpur, Assam, India. It encompasses an area of about 15.04 acre. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programmes organised by the authority and have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Many animals are dependent on these trees mainly for food and shelter. Flowers and fruits are eaten by monkeys, and nectar is a favorite of birds and many insects. Leaf – covered branches keep many animals, such as birds and squirrels, out of reach of predators. Different species display a seemingly endless variety of shapes, forms, texture and vibrant colors. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan and regal stature of trees give them a monument – like quality. They also remind us the glorious history of our institution. We often make an emotional connection with these trees and sometime become personally attached to the ones that we see every day. A thick belt of large shady trees in the periphery of the college have found to be bringing down noise and cut down dust and storms. A recent study has revealed that the rich diversity of tree species of about 48 species belonging to 27 families have sequestrated a total of 362.65 ton of organic carbon. Thus, the college has been playing a significant role in maintaining the environment of the entire Tezpur town and its surrounding areas. The following are the tree species with whom we are being attached-

Table: List of tree species of Darrang College, Tezpur

S.No	Name of the plant species	Number	Family	Common Name
1	*Samania saman Merr*	4	Fabaceae	Rain Tree
2	*Caesalpinia pulcherrima*	15	Fabaceae	Peacock Flower
3	*Borassus flabellifer*	1	Arecaceae	Tall Palm (wine palm)
4	*Cassia fistula*	4	Fabaceae	Golden Rain Tree
5	*Tectona grandis*	22	Lamiaceae	Teak
6	*Gmelina arborea*	1	Verbenaceae	Gomari
7	*Mangifera indica*	8	Anacardiaceae	Mango
8	*Anacardium accidentale L.*	2	Anacardiaceae	Kaju Badam
9	*Mimusops elengi*	40	Sapotaceae	Bakul
10	*Cocos nucifera*	10	Arecaceae	Coconut
11	*Phoenix sylvestris*	29	Arecaceae	Silver Date Palm
12	*Ficus benghalensis*	6	Moraceae	Banyan Tree
13	*Azadirachta indica*	15	Meliaceae	Neem
14	*Calliandra*	2	Fabaceae	Powder puff flower

	haematocephala			tree
15	*Eucalyptus sp.*	1	Myrtaceae	Gums trees
16	*Phyllanthus emblica*	6	Phyllanthaceae	Amlakhi(Indian gooseberry
17	*Artocarpus heterophyllus*	6	Moraceae	Jackfruit
18	*Areca catacheau*	2	Arecaceae	Beetle nut
19	*Zizyphus jujuba*	6	Rhamnaceae	Bogori(Chinese date)
20	*Syzygium cumini*	2	Myrtaceae	Jamun tree
21	*Psidium guajava*	1	Myrtaceae	guava
22	*Albizia lebbek*	8	Fabaceae	women's tongue tree
23	*Terminalia chebula*	2	Combretaceae	Xilikha(Haritaki)
24	*Olea europaea*	1	Oleaceae	Olive
25	*Citrus maxima*	1	Rutaceae	Pomello(Robab tenga)
26	*Litchi chinensis*	1	Sapindaceae	Litchi
27	*Lagerstroeni speciosa*	19	Lythraceae	Ajar Tree
28	*Mesua ferrea*	4	Calophyllaceae	Nahar
29	*Grevillea robusta*	5	Proteaceae	Silver Oak
30	*Cycas revoluta*	1	Cycadaceae	Japanese sago palm
31	*Callistemon sp.*	2	Myrtaceae	Bottle Brush Tree
32	*Alstonia scholaris*	6	Apocynaceae	Devil tree
33	*Neolamarckia cadamba*	2	Rubiaceae	Kadam
34	*Michelia champaca*	2	Magnoliaceae	Tetachapa
35	*Averrhoa carambola*	1	Oxalidaceae	Star fruit
36	*Dalbergia sissoo*	2	Fabaceae	sisu
37	*Tamarindus indica*	1	Fabaceae	Tamarind
38	*Polyalthia longifolia*	4	Annonaceae	Ashoka Tree
39	*Delonix regia*	14	Fabaceae	Krishnachura(Flame Tree)
40	*Butea monosperma*	6	Fabaceae	Bastard Teak
41	*Terminalia arjuna*	2	Combretaceae	Arjun
42	*Aegle marmelos*	1	Rutaceae	bael
43	*Calotropis gigantea*	1	Apocynaceae	Madar
44	*Bombax ceiba*	1	Malvaceae	Red cotton Tree
45	*Sapthodea campanulata*	4	Bignoniaceae	Fountain Tree
46	*Cedrus atlantica*	1	Pinaceae	Atlas
47	*Jacaranda mimosifolia*	1	Bignoniaceae	Fern Tree
48	*Pterospermom acerifolium*	1	Sterculiaceae	Hatipolia(dinner plate Tree)

Photo: Rain tree (*Samania saman Merr*) in Darrang College Campus

FAUNAL DIVERSITY IN DARRANG COLLEGE CAMPUS

Darrang College is located in Sonitpur district of Assam at the northern bank of river Brahmaputra, at the conjunction of Himalayan and Indo-Malayan Biodiversity hotspots. Darrang College of sonitpur district falls in the Sub-Tropical climate region, and enjoys monsoon type of climate. The highest temperature is recorded just prior to the onset of monsoon (around May-early June). Summer rain is heavy, and is principally caused from late June to August by the moisture-laden South-West Monsoon, on striking the Himalayan foothills of the north. The climatic condition of the Sonitpur district as a whole and Darrang College in particular is very suitable for a wide variedly of flora and fauna to support its rich biodiversity. The faunal Diversity of Darrang College campus has been studied and documented as below-

FAUNAL GROUP	**SCIENTIFIC NAMES**
SPIDERS	*Myrmachne orientalis* (Family Salticidae); *Nephila plipes* (Family-Nephilidae)*; Heteropoda* sp (Family-Sparassidae); *Phintella vitatta* (Family Salticidae)
MOTHS & BUTTERFLIES	*Antheria assmensis;Bombyx mori;Philosamia ricini; Junonia atlites atlites ;* Commander (*Moduza procris procris);Ethope himachala ; Melanitis leda leda ; Paltoporia paraka paraka; Ypthima baldus ; Acraea terpsicore ; Elymnias hypermnestra undularis ; Mycalesis perseus blasius ; Tanaecia lepidea lepidae ; Euploea core core*
OTHER INSECTS	*Apis indica*; *Apis dorsata; Apis florae, Crocothemis erythraea* (Scarlet dragonfly); *Pantala flavescens* **(**wandering glider)
AMPHIBIANS	*Duttaphrynus melanostictus* (Assian common toad), *Leptobrachium smithi*; *Fejervarya pierrei*; *Hoplobatrachus tigerinus*; *Hylarana tytleri*; *Humerana humeralis*; *Hylarana leptoglossa*; *Polypedates leucomystax*.
REPTILES	*Calotes versicolor; Hemidactylus frenatus; Hemidactylus brookii; Hemidactylus platyurus; Hemidactylus flaviviridis; Gekko gecko; Eutropis multifasciata; H. Sphenomorphus maculates* *Enhydris enhydris; Xenochrophis schnurrenbergeri; Xenochrophis cerasogaster; Rhabdophis subminiatus; Amphiesma stolatum; Chrysopelea ornate*
BIRDS	*Acridotheres tristis* (Common myna); *Streptopelia orientalis* (Oriental Turtle Dove); *Athene noctua* (little owl); *Pycnonotus cafer* (Red-vented Bulbul)
MAMMALS	*Macaca mulatta* (The rhesus macaque); Sciurus carolinensis (Eastern gray squirrel); *Pteropus giganteus* (The Indian flying fox)

Photo plates

Apis dorsata (Photographed by Rishi Das)

Commander (*Moduza procris procris)*

Myrmachne orientalis

Heteropoda sp

Striped Tiger (*Danaus genutia*)

Blue Tiger(*Triumala limniace*)

*Junonia atlites atlites (*Grey Pansy)

Crocothemis erythraea (Scarlet dragonfly)

Pantala flavescens **(**wandering glider)

Eastern Garden Lizard (*Calotes versicolor*)

Little owl (*Athene noctua*)

Red-vented Bulbul (*Pycnonotus cafer*)

Oriental Turtle Dove (*Streptopelia orientalis)*

Acridotheres tristis (Common myna)

Macaca mulatta (The rhesus macaque)

ELECTRICAL POWER CONSUMPTION AT DARRANG COLLEGE

Darrang College, being one of the largest colleges of Assam, consumes on an average 8165 kW-hr (units) of electricity which turns out to be 97981 kW-hr per year only to maintain its volumetric activities throughout the year. A small fraction, i.e., 864 kW-hr of this power requirement is met through the installed solar LED lights. In terms of percentage, this contribution turns out to be 0.88%. The college authority is planning to install more solar lights to increase this contribution. The contribution of LED bulbs and LED tubes to the net power consumption is 17.53 %. The authority keep on replacing the old filament bulbs, CFL bulbs and tube lights by low energy consuming LED bulbs and LED tubes and bulky high power consuming fans by energy efficient fans in order to keep the electricity consumption of the college as low as possible.

WEATHER DATA OF TEZPUR: DARRANG COLLEGE

Station : TEZPUR (INDIA (STATIONS NORTH OF LATITUDE 20~N))
Location : 26 37N , 92 47E , 91 masl.

Table 1 : Month-wise weather data of Tezpur (January-November, 2018)

Month Δ	T (ºC)	T. max ave. (ºC)	T. min ave. (ºC)	T. max abs. (ºC)	T. min abs. (ºC)	Prec. (mm)	Days 1 mm	Days 0.1 mm	Days storm	Days fog	F-TM	F-Tm	F-R
JANUARY 2018	18.3	24.2	12.3	26.7	9.0	0.0	0	0	0	17	100%	100%	6%
FEBRUARY 2018	20.3	25.6	14.9	29.4	10.5	8.0	3	3	2	1	100%	92%	10%
MARCH 2018	23.3	28.4	18.1	31.7	15.5	85.2	8	12	3	0	100%	100%	38%
APRIL 2018	25.3	29.9	20.6	38.1	18.4	149.9	11	16	7	0	98%	98%	60%
MAY 2018	27.0	30.9	23.2	35.7	20.1	123.0	12	16	5	0	100%	98%	51%
JUNE 2018	29.2	32.4	26.0	37.4	24.3	232.0	18	18	2	0	100%	100%	63%
JULY 2018	29.4	32.4	26.3	37.0	24.8	351.8	20	24	7	1	100%	94%	80%
AUGUST 2018	29.4	32.6	26.2	36.5	23.6	269.3	13	17	5	0	100%	100%	54%
SEPTEMBER 2018	28.9	32.2	25.7	36.7	22.2	226.1	13	16	9	0	100%	98%	60%
OCTOBER 2018	25.7	30.4	21.0	32.1	18.2	18.8	4	6	1	0	100%	100%	25%
NOVEMBER 2018	25.1	31.6	18.7	32.0	18.4	-	-	-	0	0	6%	6%	-

Table 2 : Year-wise weather data of Tezpur (2017- 2018)

Year Δ	T (ºC)	T. max ave. (ºC)	T. min ave. (ºC)	T. max abs. (ºC)	T. min abs. (ºC)	Prec. (mm)	Days 1 mm	Days 0.1 mm	Days storm	Days fog	Days frost	F-TM	F-Tm	F-R
2017	24.9	29.5	20.3	38.2	8.5	1955.9	118	140	70	14	0	99%	97%	44%
2018	25.6	30.0	21.2	38.1	9.0	1464.1	102	128	41	19	0	84%	82%	37%

(Analysis: using Meteomanz.com)

[Surface data:Temp. temperature, celsius degrees; **Rel. h.** air relative humidity;**SLP** sea level pressure, Hpa; **Prec.** amount of precipitation in 6 hours, millimeters;**Prec. T.** precipitacion type (R=rain, S=snow, F=freezing rain);**W. sp.** wind speed, Km/h; **Wind dir.** wind direction; **Min. T.** minimun temperature, celsius degrees; **Max. T.** maximun temperature, celsius degrees; **cloud covering data:** sky covering percent of low, middle and high clouds; sky covering percent of any kind of clouds.]

AIR QUALITY IN TEZPUR: DARRANG COLLEGE

The climate of Darrang College campus located in Sonitpur District of Assam is Sub-Tropical in nature and temperature varies from 7° C in January and highest 38° C in May. The average maximum temperature of the district varies from 24.09° C in the month of January to 33.12° C in the month of August. Average minimum temperature varies between 10.97° C in January to 25.23° C in the month of August. This indicates that, the coldest month during winter is January and warmest month during summer is August

The average maximum temperature of the district varies from 24.09° C in the month of January to 33.12° C in the month of August. Average minimum temperature varies between 10.97° C in January to 25.23° C in the month of August. This indicates that, the coldest month during winter is January and warmest month during summer is August.

Air Quality determination
Satisfactory air quality index (OVERALL=79) in **Tezpur, Assam, India**

Date: 02/11/18; Temp.: 27°C; clear sky

NO2	31.86 µg/m³, AQI 39 Good
NO	10.09 µg/m³, AQI 10 Good
O3	31.49 µg/m³, AQI 31 Good
PM2.5	28.13 µg/m³, AQI 28 Good
PM10	79.08 µg/m³, AQI 79 Satisfactory
CO	630.0 µg/m³, AQI 31
Humidity	76.0 %
Barometric Pressure	1003.59 hPa
Wind Speed	3.85 m/s
Wind Direction	28.0013 degrees
Sun Rise	05:28:47 AM
Sun Set	04:35:37 PM

Source : Central pollution control board, India, Ward 32 Bapupara Siliguri WBPCB

WATER ANALYSIS REPORT OF DARRANG COLLEGE

Analysis Carried Out at Department of Chemistry, Darrang College

Dr Palashmoni Saikia

Date: 22/06/18 Temp: 35.48 ^{0}C

Parameter/ WHO Permissible Level	Observed Value		Methodology
	Sample 1	Sample 2	
Colour	Clear	Clear	
pH / 6.5-6.8	6.97	6.38	pH meter
Turbidity	2.10	1.97	Turbidity meter
Salinity	0.31ppt	0.33ppt	Salinity meter
Conductance/ 0.4 mS cm^{-1}	0.63 mS cm^{-1}	0.69 mS cm^{-1}	Conductivity meter
As	-	-	-
Fe /0.30 ppm	0.40ppm	0.48pmm	Spectroscopy
Na/200 ppm	180 ppm	174 ppm	Flame photometer
K/ 12 ppm	8.03 ppm	4.2 ppm	Flame photometer
Mg/ 30 ppm	20.01 ppm	18.97 ppm	Titrimetric
Ca/ 75 ppm	52.23 ppm	54.13 ppm	Titrimetric
F^- / 1.5 ppm	BDL	BDL	Ion meter
Cl^- / 250 ppm	125.32 ppm	110.09 PPM	Titrimetric
NO_3^- / 50 ppm	24.07 ppm	25.0 ppm	Titrimetric
SO_4^-/ 250 ppm	230.87 ppm	241.76 ppm	Titrimetric
PO_4^{3-}/ 5 ppm	BDL	BDL	Spectroscopy

Sample 1: Central Water Supply, collected from department of Chemistry
Sample 2: Administrative block. Collected from old library wash room

NOISE LEVEL IN THE SURROUNDING OF DARRANG COLLEGE

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound, (1) **loudness** and (2) **frequency**.

Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of **Decibels.** Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB . The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as **Pollutant** as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level upto 65 dB is considered tolerate. **Loudness** is also expressed in **Sones**. One some equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibration per second. It is denoted as Hertz (Hz).

OBJECTIVES OF THE STUDY

The objectives of the study were as the following:

- To assess the impact on human work efficiency due to road traffic parameters, different noise indices, and attitudinal response.
- To study the temporal pattern of road traffic the study area.
- To study the existing status of noise levels in the study area by recording the noise intensity at various locations.
- Identification and consideration of suitable mitigation and abatement measures.

MATERIALS, STUDY AREA & METHODS

Noise level meter or noise measuring app, **NoiseTube** (version: 2.0.2), was used to measure the noise level. **NoiseTube** is a participatory noise

sensing project started in 2008 at the **Sony Computer Science Laboratory, Paris** in collaboration with the **Vrije Universiteit Brussel.** Since 2010 the project is maintained by the **Software Language Lab.**

- **DESCRIPTION OF THE COLLEGE SITE:**

The site of the Darrang college is bounded to the North by residential, commercial properties, to the East by the Mahabhairav road with various book stalls, shops, restaurants, hawkers etc., to the South by a side road and to the west by the college back gate road, residential properties. Fig.2. shows the satellite image of the college site.

- **MEASUREMENT PROCEDURE**

The noise level was recorded from the road side offices, organizations, and commercial business center of the road, located at the Front & Back gate areas of Darrang College, Tezpur. At different selected sites of Darrang College, noise level had been measured. At each spot, the measurements were taken for 60 seconds during day time (6 AM- 6 PM) and noted down the measurements. Screen shots of the measurements of noise were taken immediately on the app at the time of 60th second of each measurement. Some copies from the screen shots has been attached in the appendix section of the project report.

RESULTS

The results of the experiments in both the places have been tabulated in the following tables:

Table 1: Measurements of Noise in and around Darrang college:

PLACE	MEASUREMENTS (duration in Sec.)	MINIMUM (dBA)	Maximum (dBA)	AVERAGE (dBA)
Zoology Dept Area	60	6.73	56.69	43.68
Botany Dept Area	60	6.90	58.98	41.57
Boy's Common Room	60	33.45	61.8	52.27
Canteen	60	33.56	64.56	52.31
Library	60	3.14	30.34	20.93
Commerce Dept Area	60	28.82	65.33	52.82
Chemistry Dept Area	60	36.13	70.73	57.32
NAB	60	9.28	59.57	45.48
College Front Gate	60	50.73	78.08	71.02
College Back Gate	60	47.07	75.93	73.56

Source: Data collected by Rishi Das, M.Sc. 3rd Semester, Department of Zoology

After the study, the measurements of noise that we have recorded in or outside of DARRANG COLLEGE area were:

Inside the College between: 0-71 dBA

Outside the College between: 45-80 dBA

WASTE DISPOSAL OF DARRANG COLLEGE

With smart initiatives like our Think Green Campus Model, Waste Management is helping colleges and universities achieve a higher level of environmental performance. By reusing or recycling we are: Contributing to the conservation of natural resources, Saving energy, Helping to protect the environment, Reducing landfill. We will also reduce our impact on the environment by minimizing the carbon emissions associated with both disposing of old products and obtaining new ones. Darrang College adopts environment friendly practices and takes necessary actions such as – energy conservation, waste recycling, carbon neutral etc. The biological reusable waste generated are processed as organic manure for the plants available in the college campus and the other solid waste generated in the college campus is taken to the community bin of Tezpur Municipality for recycling and disposal.

Dr. Joysankar Hazarika
Editor-in-Chief

Dr. Bidhan Borah
Editor

Dr. Chittaranjan Baruah
Editor

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