

JUNE 22, 2023

**A REPORT
ON
GREEN AUDIT IN BASUGAON COLLEGE**



**SUBMITTED TO
THE PRINCIPAL
BASUGAON COLLEGE
BASUGAON, CHIRANG, BTAD (ASSAM), 783372**



GREEN AUDIT- BASUGAON COLLEGE
CERTIFICATE

Date: 22/06/2023

This is to certify that a Green Audit has been carried out in Basugaon College, P.O.: Basugaon, Dist.: Chirang, BTAD, (Assam) on 12th of May 2023.

The college has provided necessary data and credential for scrutiny. The green activities and measures carried out by the college has been verified. Water and soil test reports were examined. After collecting the required data and analyzing the same, Green Audit report has been prepared and submitted.

The data and photographs provided by the college authority or collected during audit period by the audit team are original in nature and the same have not been presented or published elsewhere.

The efforts taken by the college towards environment is highly appreciated and commendable. We are sincerely thankful to the college management for taking such initiative for environmental conservation.

Thanking you,

District Forest Officer

Chirang, BTAD, Assam

Divisional Forest Officer

Chirang Division

Kajalgaon

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Acknowledgement:

We are sincerely thankful to the Basugaon College management for giving us the opportunity to conduct green audit.

We are also grateful to Dr. Ranen Chandra Muchahary, Principal, Basugaon College, whose valuable comments / feedback, during various reviews have helped us to bring the report in the present format.

We express our sincere gratitude to all other concerned officials for their support and guidance during the conduct of this exercise.


District Forest Officer
Chirang BTAD, Assam
Chirang Division
Kajalgaon



STUDY TEAM:

1. Name: Sarol Nargary
Designation: Deputy Ranger

2. Name: Mani Gopal Pathak
Designation: Ranger

1. INTRODUCTION:

The faster economic development and industrialization leads to several environmental and ecological crisis. Use of fossil fuel and de-forestation are the major reason of climate change. To address this issue, it becomes very essential to adopt the green initiative by all the stakeholders of the society and the role of higher educational institutions is more prevalent.

Basugaon College takes initiative to contribute in sustainable development goals by reducing a significant amount of Green House Gas (GHG) from the atmosphere. As a part of this initiative, the “Green Audit” of the college campus becoming the primary important for self-assessment of the institution which reflects the role of the college in mitigating the present environmental problems.

Green Audit is an effective tool to formulate a culture of sustainability by implementing it through systematic identification, quantification, documentation, reporting and monitoring of environmentally important components. Green audit will also help in preserving the rich floral and faunal diversity in and around the campus.

2. OBJECTIVE:

The idea of the green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in the college campus. The main objectives of Green Audit are:

- Land use analysis of Basugaon college.
- Tree diversity of the college campus.
- Faunal diversity of the college campus.
- Weather data of the college.
- Soil properties of the college campus
- Water analysis of the college.
- Waste disposal of college.
- Transportation of the college.
- Electrical power consumption of the college
- Green initiative carried out by the college.

3. BENEFITS OF GREEN AUDIT:

- Better environmental practices of the institute.
- More efficient resource management.
- Benchmarking for environmental conservation initiatives.
- To create a green campus.
- Better waste management through reduction of waste generation and recycling.
- To create plastic free campus and create health consciousness among all the stakeholders of the college.
- Enhance the awareness for environmental conservation guidelines and duties.
- Cost saving methods through better resource management.
- Developing an environmental ethics and value systems among the students and other stakeholders.
- Develop a valuable tool to monitor the environmental and sustainable development of the college.
- Improvement of overall college profile.

4. METHODOLOGY ADOPTED FOR GREEN AUDIT

The methodology adopted to perform the entire Green Audit exercise includes: collection of data, physical inspection of the campus, observation and review of the documentation, data analysis and reporting.

Step 1 – Data Collection

Data collection was performed by using different tools such as observation, measurements and communicating with responsible persons of the college.

Following steps were taken for data collection:

- The audit team visited each building and department, library, canteen, open space, gardens of the campus and information was collected by interviewing with the responsible person.
- Land use data of the college has been collected.
- The energy data such as monthly electricity consumption and fuel consumption was collected from the officials and analyzed.

- Waste management facility such as waste bins, vermi-compost unit etc. has been visited, other waste disposal process adopted by the college has been discussed and noted.
- All flora and fauna found in the college campus has been identified and listed out.
- Water quality, soil property of the campus has been measured.

Step 2 – Campus tour and physical inspection

The audit team conducted campus tour on 12th May 2023 to collect the data.

Step 3 - Document review and verification

Available facility documentation is reviewed with facility representatives. This documentation review includes data related to-

- Land use pattern of the college.
- Geographical location with campus.
- Flora and faunal diversity of the college campus.
- Water analysis of the college.
- Waste management of college.
- Transportation of the college.
- Energy consumption and conservation measures taken by the college.
- Expenditure on green initiative during the last five years.

Step 4 – Key parameter measurement and testing

- Water test of the college
- Soil property test of the college

Step 5 - Data Analysis

- Analysis of land use land cover data.
- Weather data analysis (Average ambient temperature and humidity analysis)
- Energy consumption data analysis (Electricity and fuel consumption data)
- Water test report analysis.

Step 6 - Prepare a Report Summarizing Audit Findings

The results of our findings are summarized in this report. The report includes a description of the college campus including different facilities. The energy and

environmental conservation initiatives already taken by the college authority has been mentioned in the report.

Also, the necessary observation and requirements to fulfill the green campus. Discussion of all major energy consuming systems and their operation. The report incorporates a summary of all the activities and effort performed in past few years to conserve environment and energy within the campus or outside. The report also includes the activities performed by the college authorities along with the local communities for awareness generation and community participation towards better environmental practices to address the present environmental challenges.

5. DESCRIPTION OF THE COLLEGE CAMPUS

The Basugaon college was established in 1986 pertaining an eco-friendly environment. The campus is located in Basugaon town of Chirang District Assam. At present the college has 13 departments distributed in different buildings/floors of the campus which includes classrooms, computer centre etc. The college also has canteen and the playground, open greenery space with vegetation and trees.



Figure 1: Google Earth image of Basugaon College

6. LAND USE ANALYSIS:

Geographical location:

Basugaon college is situated in Chirang district of Assam. The geographical location of the college is 26.4692° N, 90.4180° E. The total area of the college is 19,960.03 sq mtr comprising 5,455.25 sq mtr total buildup area, 8,805 sq mtr playground area, 4,822.78 sq mtr is green plantation area and 877 sq mtr is parking area. The college campus area consists of numbers of buildings and most of them are assam type building along with the green vegetation area and trees.

The detail land use land cover data has been shown in figure no 2.

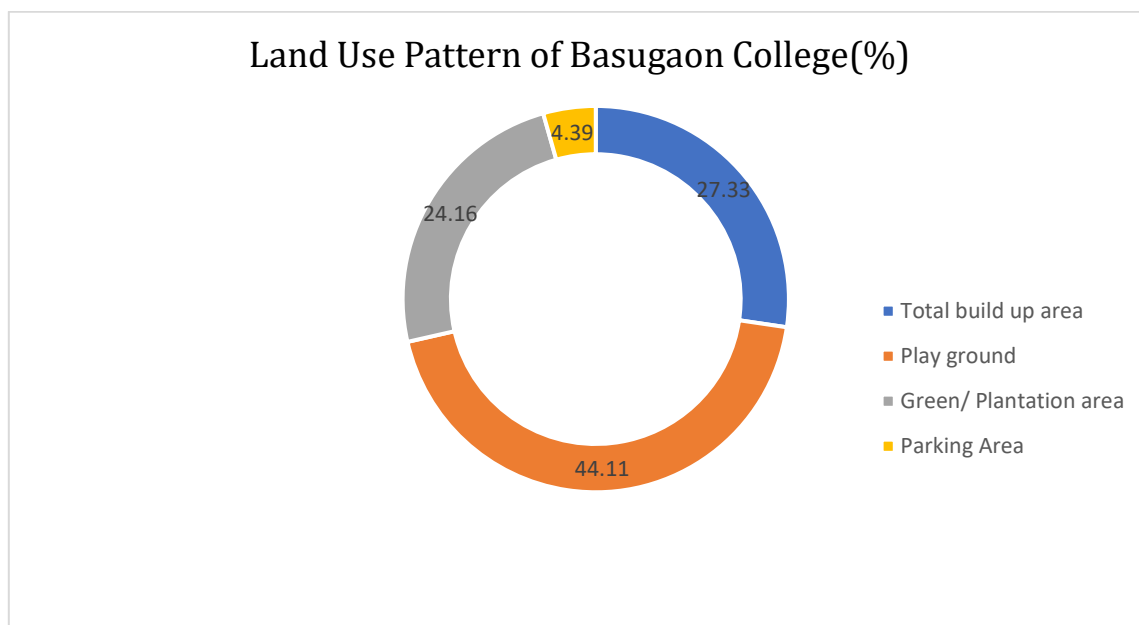


Figure 2: Land Use Pattern of Basugaon College

7. WEATHER DATA OF THE COLLEGE CAMPUS

The ambient air temperature and relative humidity data were obtained from the NASA website (<https://power.larc.nasa.gov/data-access-viewer/>)

The NASA data are satellite-retrieved; its parameters are computed on a daily average basis using NASA/GEWEX surface radiation budget model. The model considers the effect of cloud cover and local atmospheric conditions. Compared to BSRN (Baseline Surface Radiation Network) sites the NASA data showed high accuracy with Bias (less

than 0.12) and RMSE (Root Mean Square Error) (less than 18%). BSRN sites are the most accurate approved ground sites.

The below table shows the monthly average air temperature and relative humidity of Basugaon College campus for the year of 2022 (January to December). It has been observed that the average air temperature of the campus is ranging between 15.84 °C to 28.44 °C whereas the average relative humidity of the campus varies from 60.87 % to 88.95%.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max air temp (°C)	18.08	19.36	26.83	26.16	28.36	28.59	30.88	29.81	28.25	28.19	22.69	21.90
Min air temp (°C)	13.20	12.57	19.14	23.53	24.02	25.98	26.98	27.05	25.91	21.56	18.47	15.74
Avg air temp (°C)	15.88	15.84	23.71	24.91	27.05	27.49	28.39	28.44	27.05	24.62	20.38	19.30

Table 1: Monthly Temperature variation of Basugaon College

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max RH (%)	88.62	86.81	82.25	84.81	88.69	94.25	93.12	92.00	94.12	95.44	87.00	78.25
Min RH (%)	68.19	66.31	49.94	66.56	69.25	81.38	80.69	80.50	79.94	68.44	71.94	56.12
Avg RH (%)	79.29	75.74	60.87	77.94	81.48	88.95	87.03	86.03	88.81	84.69	80.71	67.27

Table 2: Monthly Relative Humidity variation of Basugaon College

8. WATER QUALITY OF THE COLLEGE CAMPUS

Water quality testing is an important task of green audit as it identifies contaminants and avoids water borne diseases. Basugaon College uses ground water for their daily needs. Water is being used in the campus as drinking water, used in washrooms and for gardening and other purposes. Therefore, it is very important to test the water to ensure the quality to use for all purposes. Water used for drinking is filtered by using water purifier system installed in different locations of academic buildings. Cleaning of the water filter is carried out on regular basis to ensure the better quality of drinking water.



Figure 3: Water Purifier installed in the campus


Drinking water indicators:

The following is a list of indicators often measured to identify the quality.


- Alkalinity
- Color of water
- PH Value
- Taste and odor
- Dissolved metals and salts (sodium, chloride, potassium, calcium, manganese, magnesium)
- Microorganisms such as fecal coliform bacteria (*Escherichia coli*), *Cryptosporidium*, and *Giardia lamblia*; see Bacteriological water analysis
- Dissolved metals and metalloids (lead, mercury, arsenic, etc.)

- Dissolved organics: colored dissolved organic matter (CDOM), dissolved organic carbon (DOC)
- Heavy metals

Water quality test has been conducted by District Level laboratory, Public Health Department (PHE), Basugaon and the report of the same has been furnished as figure 4. The values of the various parameters of the water sample tested are within WHO Permissible limit. So, the water sample may be considered as good quality drinking water on the basis of these parameters. Still, it is suggested that the water should be consumed after simple processing like filtration and boiling to avoid any health-related issues.



DISTRICT LEVEL LABORATORY, BASUGAON.
Address: Basugaon , Chirang, 783372
Email ID: dlbasugaon@gmail.com



Test Report

Test Report No	: PHE /DLLB/23-24/76	Report Issue Date	: 16/05/23
ULR No.	: TC107652300000076F	Client Ref No:	2475
Issued To	: Sanjib Debnath	Pin Point Location	: Basugaon College.
Sample Description:	: Drinking Water	Block	: Sidli Chirang
Sample Type/Source	: H/T/W	VCDC	: Fulguri
Sample Collected By	: Sanjib Debnath	Village	: Basugaon
Date of Receipt	: 10-05-2023	Habitation	: Basugaon
Test Start Date	: 10-05-2023		
Test End Date	: 11-05-2023		

Sample is not withdrawn by the laboratory

Sr. No	Parameter	Protocol Used	Results	IS:10500:2012(Second Revision)		Unit
				Desirable limit	Max Permissible limits	
1	Colour	IS 3025(Part4)	.....	5	15	Hazen units
2	Odour	IS 3025(Part5)	Agreeable	Agreeable	Agreeable	-
3	pH	IS 3025(Part11)	6.72	6.5 to 8.5	No relaxation	-
4	Taste	IS 3025(Part8)	Agreeable	Agreeable	Agreeable	-
5	Turbidity	IS 3025(Part10)	2.0	1	5	NTU
6	Total dissolved solids	IS 3025(Part16)	80	500	2000	mg/l
7	Total Hardness	IS 3025(Part21)	100	200	600	mg/l
8	Total Alkalinity	IS 3025(Part23)	40	200	600	mg/l
9	Chloride	IS 3025(Part32)	21.27	250	1000	mg/l
10	Calcium	IS 3025(Part40)	.....	75	200	mg/l
11	Magnesium	APHA -3500-Mg B 23rd Edition	.....	30	100	mg/l
12	Sulphate	IS 3025(Part4)	.....	200	400	mg/l
13	Nitrate	IS 3025(Part4)	.....	45	No relaxation	mg/l
14	Iron	APHA -3500-Fe B 23rd Edition	0.15	1	No relaxation	mg/l
15	Fluoride	APHA -4500-F D 23rd Edition	0.24	1	1.5	mg/l
16	Arsenic	IS 3025(Part37)	BDL	0.01	No relaxation	mg/l

Note:

- The test results given above are related to the sample received and tested in this laboratory. Reliability of the sample lies with the sender.
- This test report shall not be reproduced in whole or in part, without the written permission of laboratory.
- The test report cannot be used for any publicity or any legal purposes.
- The test samples meant for chemical analysis will be disposed of after 15 days from the date of issue of test report unless until specifically requested by customer for retaining over a longer period.

.....END OF REPORT.....

Sukumar Bly,
Tested by


Quality Manager
District Level Laboratory (PHE)
Kokrajhar Division No.- II
Chirang

LAB/QF- 7.8

Figure 4: Water Test Report

9. AIR QUALITY OF THE COLLEGE CAMPUS

Air pollution which is majorly caused due to the combustion of fossil fuel become a concern in all over the world. The degradation of air quality impacts the human health. To identify the air quality, measurement of major pollutant concentrator was carried out during the audit. Particulate Matter (PM), Carbon di oxide (CO₂) and Formaldehyde (HCHO) concentration along with ambient air temperature and relative humidity has been measured. Particulate Matter (PM) consists of various mixtures of suspended particles in the air. Particulate Matter (PM) is mainly produced by various natural and anthropogenic activities. However, the significant sources of this pollutant are factories, thermal power plants, motor vehicles, construction activities, forest fires, and natural windblown dust. Particulate Matter (PM) specifically PM₁₀ and PM_{2.5} significantly causes a wide variety of respiratory, cardiovascular, and pulmonary diseases.

The test was conducted with the help of air quality meter Temtop-M 2000. This instrument is sensitive to the size of particles of aerodynamic diameter of 2.5 µm and 10 µm. These range is assumed as the most important for affecting the health of people. All the pollutant concentrations were recorded for 60 seconds in the memory of the instrument, which further downloaded and analyzed. Indoor and outdoor readings of PM_{2.5}, PM₁₀, CO₂ and HCHO were recorded.

Below table shows the measured parameters as mentioned above.

Sl. No	Building/Block	Measurement duration	PM _{2.5} (µm/m ³)	PM ₁₀ (µm/m ³)	CO ₂ (ppm)	HCHO (mg/m ³)
1	Administrative Block (Indoor)	60 Sec	43.7	61.5	451	0.054
2	Class Room (Indoor)	60 Sec	55.7	80.7	430	0.049
3	Indoor stadium and auditorium (Indoor)	60 Sec	42.7	59.7	442	0.055
4	In front of administrative block (Outdoor)	60 Sec	36.6	52.3	405	0.029

Table 3: Air Quality Detail

10. SOIL PROPERTY OF THE COLLEGE CAMPUS

The soil quality inside the campus of Basugaon college was tested by the office of the Assistant Soil Chemist, Soil Testing Laboratory, Kokrajhar BTC, Assam. Parameters like pH, TSS, organic carbon, potassium, nitrate and phosphate etc. were tested. The detailed test result is given in figure below-

অসম চৰকাৰ ৰ কৃষি বিভাগ
সহকাৰী মাটি ৰসায়নবিদ বিষয়াৰ কাৰ্যালয়
কোকৰাঝাৰ, বি.টি.চি., অসম

পৰীক্ষাগাৰ নং STL/k-2 নমুনা নং 221/01/2023-24 মাটিৰ পৰিমাণ.....
 যেতিয়কৰ নাম আৰু ঠিকনা শ্ৰী Dr. Ganesh Ch. Mustha Ch. Principal, Basugaon College, Basugaon, Nalbari Dist.
 পোঃ অঃ Basugaon উন্নয়ন বৃত্ত Sidli কৃষি উন্নয়ন বিষয়াৰ কেন্দ্ৰ Bonglat কৃষি মহকুমা/জিলা Kajalgaon/Chirang
 নমুনা পঠোৱাৰ নাম আৰু ঠিকনা.....

মাটি পৰীক্ষাৰ ফলাফল	
পৰীক্ষাৰ বিষয়	পৰীক্ষাৰ ফলাফল
(১) স্ফৰ্ণতা (pH)	৭.৬৪
(২) মুঠ দ্রবিত লো (T.S.S.) mm hos/om.	.....
(৩) জৈবিক এন্ধাৰ % (Organic-Carbon)	১.০৬
(৪) সংজ্ঞালভ্য ফচফৰাচ (P ₂ O ₅) কিলো / একৰ	১৩.৫০
(৫) সংজ্ঞালভ্য পটাচ (K ₂ O) কিলো / একৰ	১৪.০১
(৬) মাটিৰ ঘৰণ (Texture)	Sandy Loam

ক্রমিক নং	শস্যৰ নাম আৰু জাত	শক্তি বিঘাত কিলোগ্রাম হিচাবে অনুমোদিত সাৰৰ পৰিমাণ		
		নাইট্ৰজেন যুক্ত সাৰ	ফচফৰাচ যুক্ত সাৰ	পটাচ যুক্ত সাৰ
১।	শালি ধানঃ খন্দৰা / উচ্চ উৎপাদনশীল	১২ kg/bigha	৩০ kg/bigha	৩ kg/bigha
২।	১) Rapeseed / Mustard (Rainfed)	240 g/plot	240 g/plot	550g/plot
৩।	২) Banana plantation			
৪।				
৫।				
৬।				

ইয়াৰ উপৰিও বিঘাই শক্তি (ক) পচন সাৰঃ 1.2 kg কুইণ্টল। (খ) চূৰণ গুৰিঃ..... কুইণ্টল দিব।
 বিঃ দ্ৰঃ (১) ইয়াৰ বাহিৰে অন্য সাৰ দিবলগীয়া হলে কৃষি উন্নয়ন বিষয়া বা কৃষি সম্প্রসাৰণ কৰ্মীৰ পৰামৰ্শ ল'ব।
 (২) আপোনাৰ মাটিডৰাৰ বিষয়ে আৰু কিবা তথ্য জানিব খুজিলে উপৰোক্ত পৰীক্ষাগাৰ নং উল্লেখ কৰি পত্ৰ পোৱাৰ এমাহৰ ভিতৰতে নিম্ন স্বাক্ষৰকাৰীলৈ লিখিব।

[Signature]
 সহকাৰী ৰসায়নবিদ
 Soil Testing Laboratory
 Kokrajhar, B.T.C., Assam

Figure 5: Soil Test Report

11. NOISE LEVEL OF THE CAMPUS AND SURROUNDING AREA

Under the Air (Prevention and Control of Pollution) Act, 1981, noise is considered as a pollutant. Noise mostly occurs in two major situations community noise and industrial noise. Community noise is also called environmental noise and is defined as the noise emitted from all the sources except the noise from the industrial sources. As far as community noise is concerned the WHO guidelines recommend less than 35

dB(A) in classrooms which is important for good teaching and learning conditions. The noise level monitoring was carried out to assess the equivalent noise level (Leq) around the Basugaon College campus. The test was carried out for 60 min in each location and the maximum, minimum and the average noise level readings were recorded. The noise monitoring was carried out at the 4 different locations within the campus. Below table shows the measured noise level in the campus.

Sl. No	Building/Block	Measurement	
		duration (in Sec)	Average (dB)
1	Administrative Block (Indoor)	60 Sec	47
2	Class Room (Indoor)	60 Sec	39
3	Indoor stadium and auditorium (Indoor, No occupancy)	60 Sec	21
4	In front of administrative block (Outdoor)	60 Sec	58

Table 4: Noise level test in different locations

From the data obtained Table 6, it was observed that the ambient noise levels in certain locations found as slightly beyond the prescribed standard limit during testing period. The exceeding of maximum permissible limits in these areas can be attributed to the noise emerging from vehicular movements through nearby roads. Although the noise level in most of the location were found as slightly on higher side, the same is permissible by keeping in mind to minimize as much as possible and not allowed to exceed the limit. As per WHO noise quality guidelines, noise level values are summarized with regard to specific environments and effects. For each environment and situation, the guideline values take into consideration the identified health effects and are set, based on the lowest levels of noise that affect health (critical health effect).

Specific Environment	Time Base (hours)	Standard limits as per WHO guidelines	
		LAeq [dB]	LAm _{ax} , fast [dB]
Outdoor living area	16	50 - 55	-
Dwelling, indoors, Inside bedrooms	16	35	-
bedrooms	8	30	45
Outside bedrooms	8	45	60

School class rooms and pre-schools, indoors	During class	35	-
Pre-school bedrooms, indoors	Sleeping time	30	45
School, playground outdoor	During play	55	-
Hospital, ward rooms, indoors	8 16	30 30	40 -
Hospitals, treatment rooms, indoors	-	As low as possible	-
Industrial, commercial, shopping and traffic areas, indoors and outdoors	24	70	110
Ceremonies, festivals and entertainment events	4	100	110
Public addresses, indoors and outdoors	1	85	110
Music through headphones/earphones	1	85 (under headphones, adapted to free-field values)	110
Impulse sounds from toys, fireworks and firearms	-	-	120-140 (peak sound pressure (not L _{Amax} , fast), measured 100 mm from the ear)
Outdoors in parkland and conservation areas	-	Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural	

background
sound should
be kept low

Table 5: Standard limit of noise level as per WHO guidelines

12. TREE DIVERSITY OF THE COLLEGE CAMPUS

The college campus area is vastly diverse with a variety of tree species. These tree species are the integral part of the college. Most of these tree species are planted by the college authority through various tree plantation programs conducted in different periods of time. These plants have increased the quality of life by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife. The impact of these plants is not only within the college fraternity but also the people surrounding the college. They contribute to the environment by moderating the effects of the sun, rain and wind and by absorbing and filtering the sun's radiant energy, keeping the campus cool in summer. Many species of birds are dependent on these trees mainly for food and shelter. Thus, the college campus has been playing a significant role in maintaining the environment of the entire area.

The study was carried out in the entire college campus to identify the various tree species and reveals that a total 61 numbers of tree species belonging to different families are found in the campus. The following are the tree species found in the college campus.

**Basugaon College,
PO-Basugaon,
Dist.- Chirang, B.T.R, (Assam)
Pin- 783372**

Name of Trees and Plants of Basugaon College: -

Sl. No	Assamese Name	English Name	Scientific Name
1	জলফাই	Indian olive	Elaeocarpus floribundus
2	বেল গছ	Wood apple	Aegle marmelos
3	কঁঠাল	Jackfruit	Artocarpus heterophyllus
4	মধুৰীআম	Guava	Psidium guajava
5	পনিয়ল	Indian cherry	Flacourtia jangomas
6	ভামোল	Betel nut palm	Areca catechu
7	কল	Banana	Musa spp.
8	পাইন	Pine	Pinus spp.
9	গামেৰী	Beech wood	Gmelina arborea
10	চজিনা	Drum stick tree	Moringa oleifera
11	দেৱদাৰু	Mast tree	Polyalthia longifolia
12	সোণাৰু	Golden shower tree	Cassia fistula
13	ডিমৰু	Indian fig tree	Ficus glomerata
14	বকুল	Bullet wood	Mimusops elengi
15	কৰচ	Indian beech	Derris indica
16	লালি		Walsura robusta
17	সৰু মণিকুট	Footstool plam	Saribus rotundifolius
18	বৰ পাতি	Chinese fan plam	Livistona chinensis
19	এককি তাল	Bottle palm	Hyophorbe langenicaulis
20	নাৰিকল	Coconut tree	Cocos nucifera
21	অগৰু	Agar wood	Aquilaria malaccensis
22	ক'লাজামু	Black plum	Eugenia jambolana
23	ভাটেতিতা	Rod Tower Gingor	Phlogacanthus tubiflorus
24	ডিঙডিঙা	Indian trumpet tree	Oroxylum indicum
25	জিয়া	Indian ash tree	Lannea coromandelica
26	গমাৰী	Beech wood	Gmelina arborea
27	পিঙকং পাতলি	China doll	Radermachera sinica
28	জবা	China rose	Hibiscus rosa-sinensis

29	উজ্জ্বীবন	Good luck plant	Cordyline fruticosa
30	আম	Mango	Mangifera indica
31	মধুৰীআম	Guava	Psidium guajava
32	কাগজ ফুল	Great Bougainvillea	Bougainvillea spectabilis
33	আমলখি	Indian gooseberry	Phyllanthus emblica
34	ইউকেলিপটাগ গছ	Eucalyptus tree	Eucalyptus globulus
35	শিলিখা	Chebolic myrobalan	Terminalia chebula
36	নিম	Neem	Azadirachta indica
37	ৰঙাচন্দন	Red sandal	Pterocarpus santalinus
38	বৰপাত	Kim	Mitragyna parvifolia
39	খেজুৰ	Date palm	Phoenix dactylifera
40	ভগৰ	Cape jessmine	Gardenia angusta
41	থুজা	Thuja	Thuja orientalis
42	অশোক	Ashok tree	Saraca asoca
43	গোলাপ	Rose	Rosa spp.
44	অশোক ফুল	Ashoka flower	Saraca asoca
45	পমা	Indian mahogany	Toona ciliata
46	বগৰী	Jujube fruit	Ziziphus mauritiana
47	শাল	Sal tree	Shorea robusta
48	নেমুটেঙা	Sour lime	Citrus aurantifolia
49	বান্ধী	Term plant	Trema orientalis
50	শিলিখা	Chebolic myrobalan	Terminalia chebula
51	তেজপাত	Bay leaf	Cinnamomum tamala
52	টৰিয়া	Canarium	Canarium indicum
53	বেলগছ	Woo apple	Aegle marmelos
54	সম্পলা গছ	Pencil cactus	Euphorbia tirucalli
55	ভগৰ	Common gardenia	Gardenia angusta
56	জুতি ফুল	Arabian jasmine	Jasminum sambac
57	লতা কৰৰী	Bush allamanta	Allmanda schottii
58	ৰংগলিতা	Texas fire bush	Hamelia patens
59	হাইতাল	Palm	Phoenix dactylifera
60	টকৌ	Himalayan fan palm	Livistona jenkinsiana
61	চাজিনা	Drum stick tree	Maringa oleifera



Jahni Chandra Ray

Signature

Assistant Professor
Department of Botany
Bijni College

Table 6: Tree Diversity of College Campus

13. FAUNAL DIVERSITY OF THE CAMPUS

The faunal diversity of the college has been studied and listed as below-

Animal Group: Aves

Local Name:	Common Myna
Scientific Name:	<i>Acridotheres Tristis</i>
Local Name:	House Crow
Scientific Name:	<i>Corvus Splendens</i>
Local Name:	House Sparrow
Scientific Name:	<i>Passer Domesticus</i>
Local Name:	Red-Vented Bulbul
Scientific Name:	<i>Pycnonotus Cafer</i>
Local Name:	Common tailor bird
Scientific Name:	<i>Orthotomus sutorius</i>
Local Name:	Spotted dove
Scientific Name:	<i>Streptopelia chinensis</i>
Local Name:	Koel
Scientific Name:	<i>Eudynamys scolopaceus</i>
Local Name:	Jungle babbler
Scientific Name:	<i>Argya striata</i>
Local Name:	Black Crowned Night Heron
Scientific Name:	<i>Nocticorax nycticorax</i>
Local Name:	Small Blue Kingfisher
Scientific Name:	<i>Alcedo atthis</i>
Local Name:	Great Egret
Scientific Name:	<i>Ardea alba</i>

Animal Group: Reptilia

Local Name:	Tej pia
Scientific Name:	Chamaeleo sp.
Local Name:	Common house gecko
Scientific Name:	<i>Hemidactylus frenatus</i>

Animal Group: Amphibia

Local Name:	Asian Common Toad
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Scientific Name:	<i>Duttaphrynus melanostictus</i>
Local Name:	Snail
Scientific Name:	<i>Achatina fulica.</i>

Animal Group: Anthropoda

Local Name:	Dragonfly
Scientific Name:	<i>Anax indicus</i>
Local Name:	Grasshopper
Scientific Name:	<i>Tettigonia viridissima</i>
Local Name:	Honey Bee
Scientific Name:	<i>Apis florae</i>
Local Name:	Indian Cabbage White
Scientific Name:	<i>Pieris canidia</i>
Local Name:	Mottled Emigrant
Scientific Name:	<i>Catopsilia pyranthe</i>
Local Name:	Oriental Striped Tiger butterfly
Scientific Name:	<i>Danaus Genutia</i>

Table 7: Faunal Diversity of Basugaon College

14. WASTE DISPOSAL OF THE COLLEGE

The activity and actions required to manage the waste from beginning to the final disposal is called as waste disposal process. The activities include the collection of waste, transportation, treatment and disposal of waste considering waste management process. At present the biodegradable waste are decomposed within the college campus, non-biodegradable waste such as single used plastics are burned out periodically. E-waste is generally kept in the store room. On the other hand, the wet waste such as vegetable, excess food is taken by the local vendor.

14.1 SOLID WASTE MANAGEMENT:

The college administration kept waste bins in suitable location of the building from where cleaning staffs take the wastes. From these waste bins, wastes are dumped in a designated place to decompose regularly. There are different types of waste generated within the campus. Out of these some of the major wastes are as paper waste, organic waste, e-waste etc.

Separation of bio degradable waste and non-biodegradable waste is one of the major tasks of solid waste management. Basugaon College practices the separation of these two types of waste by keeping different waste bins for different waste. Biodegradable waste is taken to generate organic fertilizer through vermicomposting unit within the campus which are further used in the gardens as organic manure.



Figure 6: Waste collection bins of the College



Figure 7: Vermicompost Unit

14.2 LIQUID WASTE MANAGEMENT:

Liquid waste is generated from hostels and canteen.

Liquid wastes generated by the College are of two types:

1. Sewage waste
2. Canteen effluent.

The liquid wastes are mainly drained. The college does not have any sewage treatment plant yet.

14.3 E-WASTE MANAGEMENT:

Basugaon college follows suitable mechanism to dispose E-wastes generated from various sources. E-wastes are generated from computer laboratories, academic and administrative offices. The E-waste includes out of order equipment's or obsolete items like laboratory instruments, electronic circuits, computer desktops or different computer components, laptops and accessories, printer and cartridges, charging cables, Wi-fi devices and cables, CCTV components, sound systems, display units, UPS and battery, biometric machine, scientific instruments etc. All these wastes which cannot be reused or recycled is being disposed through authorized vendors.

Basugaon college signed an MOU with Tech Cube, Kokrajhar to collect, transport and dispose of E-waste generated in the college.



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MEMMORANDUM OF UNDERSTANDING(MOU)

Between

Tech Cube, Boubazar, J.D. Road, Kokrajhar, ASSAM-783370

&

BASUGAON COLLEGE, BASUGAON
PO- BASUGAON, PS- BASUGAON, ASSAM-783372

For
PURCHASE OF E- WASTE

This MoU is entered into on the 5th August 2022

By and Between

Tech Cube acting through its authorized signatory Mr. Partha Bhattacharjee

Tech Cube

And

PRINCIPAL, Basugaon, PO- Basugaon, PS- Basugaon, Assam Represented herein by
its Principal Dr. Ranen Ch. Muchahary

Partha Bhattacharjee

WHEREAS:

- A. First party is a Firm, deals in sales and services of electronic devices, named as:
Tech Cube, Boubazar, J.D. Road, Kokrajhar, ASSAM-783370
- B. The second party is **Basugaon College**, PO- Basugaon, PS- Basugaon, Assam, a Government aided College, engaged in Higher Education Sector.

L.I.N.C.B.M 28/2007
C. no. 319
Name:
Address:
Date:
Stamp Under
G.D. Clerk
B.M.

HC Strong Room
Responsible and Treasury

M. S. ...

Tech. ...

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- C. First party and second party believe that collaboration and co-operation between themselves will promote effective use of each of their resources and provide each of them with enhanced opportunities.
- D. The parties, intent to cooperate and focus their efforts on cooperation within area of Purchase of E- Waste.
- E. Both parties, being legal entities in themselves, desire to sign this MoU for advancing their mutual interests.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MOU, THE PARTIES HERE IN TO AGREE AS FOLLOWS:

AREAS OF COOPERATION

1. **Tech Cube** shall collect, transport and dispose the E- Waste collected from the premises of Basugaon College. It shall be the responsibility of **Tech Cube** to demagnetize the hard disks before disposing them off in accordance with the terms of content. If the hard disk come along with the CPU the activity would be taken care by **Tech Cube** at free of cost. However, in case of an exclusive consignment of hard disks for demagnetization by the **Basugaon College** it shall be chargeable in accordance with the term of contract.
2. The Basugaon College shall segregate the E- Waste at one designated place within the premises from where the representatives of **Tech Cube** shall collect the E- Waste.
3. Upon intimation from **Basugaon College**, **Tech Cube** shall within 15 days there from, arrange for collection of E- Waste as per the applicable provisions.
4. The liability of **Basugaon College** shall cease once the E- Waste has been collected by **Tech Cube** from its premises expect for any non-disclosure of any material information known to **Basugaon College** with regard to the E- Waste from **Tech Cube** during the handover of such E- Waste.
5. **Tech Cube** shall issue a safe destruction certificate as prescribed under applicable laws within fifteen (15) days from receipt of such request.

Dr. Artho Bhattacharya

PAYMENTS:

1. **Tech Cube** shall pay the best market value inclusive of all taxes per each kilogram for payment of E- Waste collected as per the weight slip submitted and accepted by it.
2. The payment shall be made by **Tech Cube** within thirty (30) days of the collection of E- Waste in the form of a electronic transfer/cheque.

TERMS AND TERMINATION

1. This MoU shall be in force for period of 3 years from the date of signing of this MoU. Upon completion of the term, The MoU may be renewed at the option of both the parties in writing on mutually agreed terms and conditions.
2. The MoU may be terminated by either party without assigning any reason, by giving fifteen (15) days prior written notice to the other party.

Signature of Authorized Signatory

Dr. Ranen Ch. Muchahary
Principal
Basugaon College


Mr. Partha Bhattacharjee
Proprietor
Tech Cube

Witness:

1. 
- 2.

Figure 8: MOU for E-Waste Disposal

15. VEHICULAR MOVEMENTS:

It was estimated that on an average around 20 nos. of two wheelers and 10 nos. of four-wheeler vehicles has a regular movement in the campus. The College has a designated parking place for faculty and student separately.

16. ELECTRICAL POWER CONSUMPTION AND ENERGY CONSERVATION INITIATIVES

Energy consumption in different forms has been continuously rising almost in all the sectors- agriculture, industry, transport, commercial, residential (domestic) and educational institutions. This has increased the dependency on fossil fuels and electricity. Therefore, energy efficiency improvement and possible energy conservation became a necessary objective for energy consumers. The Government of India enacted the Energy Conservation Act, 2001 in October 2001. The Energy Conservation Act, 2001 became effective from 1st March, 2002. The Act provides for institutionalizing and strengthening delivery mechanism for energy efficiency programs in the country and provides a framework for the much-needed coordination between various Government entities.

The following Tables show the basic information about the building and the utilities.

Sl. No	Basic Building Data	Value
1	Connected Load/Contract Demand (For Academic & Administrative Building) Consumer Number: 051000000688	6 kW
2	Diesel Generator set availability	30 kVA (1 No) Make: Jakson Limited Model: JSPF-30 15 kVA (1 No) Make: Jakson Limited Model: JSP-15
3	Electricity consumption (April' 2022 to March' 2023)	6,857.00 kWh
4	Cost of electricity consumption (April' 2022 to March' 2023) @ 6.55/unit	Rs. 89,516.33

4.1	Cost of electricity consumption through DG set.	Rs. 54,000.00
4.2	Total cost of electricity (Utility + DG set)	Rs. 1,43,516.33
5.1	Working hours (Academic and Administration building)	8 Hrs (9 AM to 5PM)
5.2	Working hours (Hostel building)	24 Hr x7 days
5.3	Working Days/week	6 Days
6	Whether sub-metering of electricity consumption for each building	No

Table 8: Basic building Description

16.1 PRESENT ENERGY SCENARIO

16.1.1 Review of analysis of electricity bill of Basugaon College.

At present the overall energy consumption is catered by the electricity supply from Assam Power Distribution Company Limited. The college has electrical connection having consumer number (51000000688) with connected load/Contract demand as 5kW.

16.1.2. Energy Consumption.

The total electricity consumption from April' 2022 to March' 2023 was 6,857.00 kWh and the total bill paid to distribution companies was Rs. 89,516.33

Monthly electricity consumption(kWh) and electricity bill (Rs.) paid from April' 2022 to March' 2023 has shown in figures below.

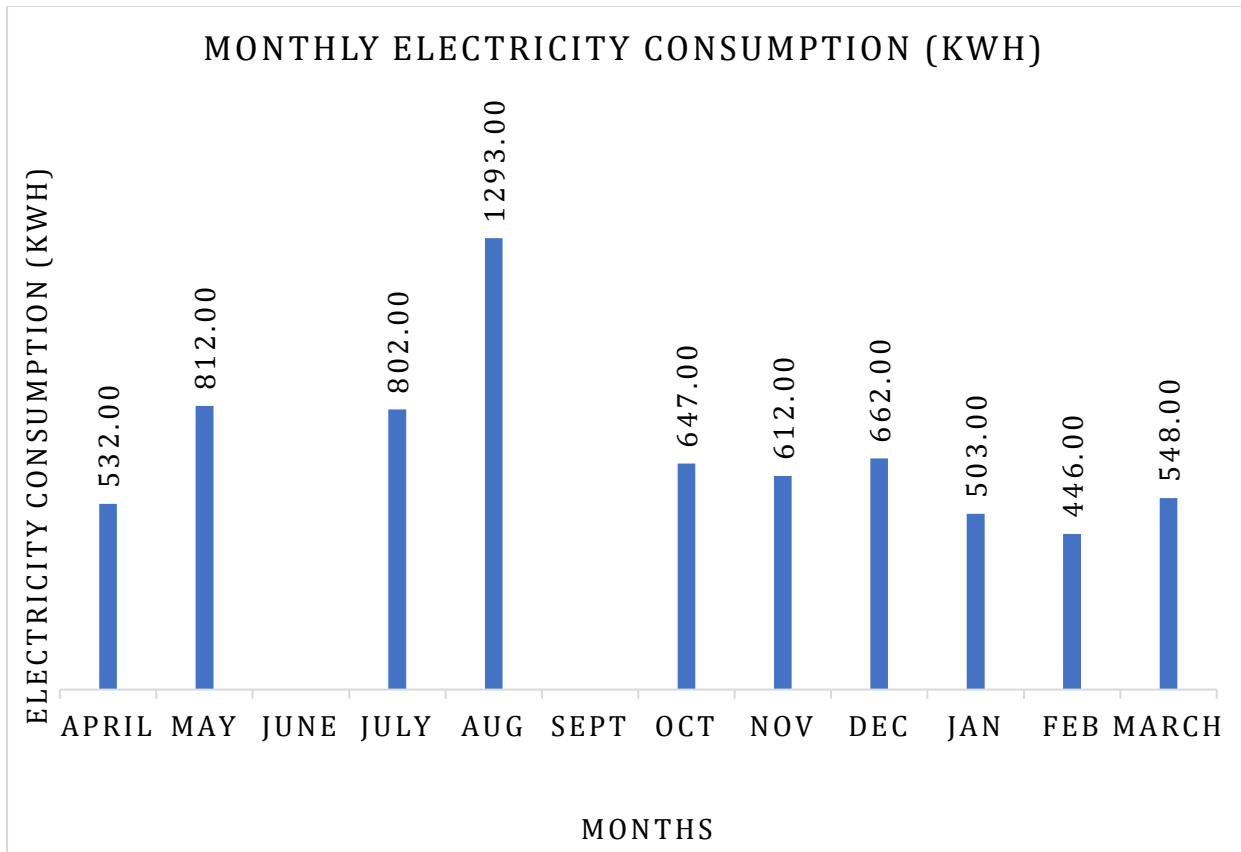


Figure 9: Monthly Electricity Consumption (April' 2022 to March' 2023)

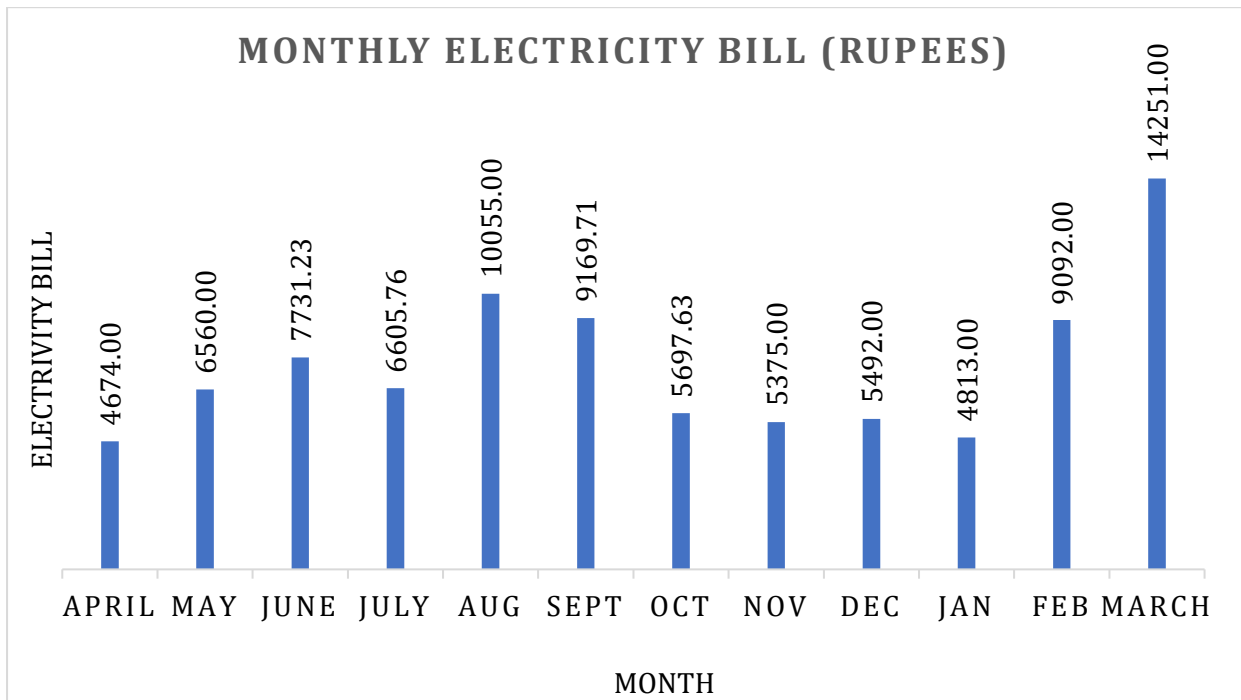


Figure 10: Monthly Electricity Bill (April' 2022 to March' 2023)

17. RENEWABLE ENERGY INTEGRATION IN THE CAMPUS

Basugaon college has installed a 10 kWp grid connected solar power plant in the roof of hostel building. It is estimated that the energy generation from the solar power plant will reduce the energy consumption from the grid.



Figure 11: 10 kWp Solar Power Plant installed in the campus

18. ROUTINE GREEN PRACTICES

- World Environment Day Celebration:

The Basugaon college celebrates world environment day every year through a participatory event not only within the barrier of college campus but also along with the local community. Awareness campaign were organized on various environmental issues along with tree plantation within and outside the campus were carried out during the day.

- Reducing the use of Paper:

The college administration adopts the concept of utilization of paper as less as possible. Practices like, re-use of one-sided paper for notes, sketches, rough work, rough printouts, etc.; cashless transactions, and utilizing multi user printer at central administrative locations of the Institute office also aims at reducing the use of papers.

- Usage of bicycles and public transport:

The college administration always promotes the use of bicycles among the staff and students. Hostellers are discouraged from having two wheelers/cars. Three-wheeler E-Rikshaw are one of the sustainable transports adopted by the students and other staff.

- Installation of Signboard and Posters:

To create an awareness among all the stakeholders of the college and to initiate the behavioral change towards the sustainable environmental practices the college authority has install several posters, stickers and signboards. It is expected that this may reduce the wastage of resources.



Mission "Clean and Green" organized by IQAC Basugaon College on 21st October 2022



Tree Plantation in the College Campus



Tree plantation and extention activity outside the college campus



World Environment Day Celebration on 5th June 2023

