

GREEN AND ENERGY AUDIT REPORT (2022-2023)



Panigaon Om Prakash Dinodia College
Panigaon, North Lakhimpur, Assam-787052
Website: opdcollege.edu.in



OFFICE OF THE PRINCIPAL

লক্ষীমপুৰ বালিকা মহাবিদ্যালয়
LAKHIMPUR GIRLS' COLLEGE

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Date: 07-09-2023

From: Dr. Surajit Bhuyan
Principal
Lakhimpur Girls' College
North Lakhimpur

To: Dr. Suresh Dutta
Principal
Panigaon OPD College
Panigaon, North Lakhimpur

Ref No.: Your letter dated. 25th June, 2023

Subject: Submission of Green and Environment Audit Report

Sir,

With reference to the letter cited above, I am pleased to submit the final draft of Green and Environment Audit Report of Panigaon OPD College, Panigaon, North Lakhimpur, Assam. The report has been prepared by collecting the required data and analyzing those data by the members of Eco-Club, Lakhimpur Girls' College. The report includes our findings and necessary recommendations. I hope that this activity will improve the eco-friendly environment and energy utility efficiency of the college campus.

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

With regards

Enclosed:

Green and Environment Audit Report

Yours faithfully


Principal

Lakhimpur Girls' College
North Lakhimpur
Principal

Lakhimpur Girls' College
North Lakhimpur



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1. INTRODUCTION

Green and environment 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 Environment 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 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 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 to 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 and Environment 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.

Green and environment audit of the Panigaon Om Prakash Dinodia College is primarily concerned with the appraisal of all available natural resources, those have been endowed by birth and at present context what extent of these resources have been exploited so far and also to have a scientific future plan of remaining resources by keeping environmental sustainability in mind. To conduct an audit on such a vital issue, we have to review first about the all available resources of our environment concerned and secondly their existing managerial practices and lastly their future plan of exploitation keeping the RRR (Reduce, Reuse and Recycle) principle in mind.

2. OBJECTIVES

In recent time, the green and environment audit of an institution has become of paramount importance 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 and environment 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 the green and environment audit of the Panigaon Om Prakash Dinodia College are as follows:

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

3. METHODOLOGY

The purpose of the green and environment audit of Panigaon Om Prakash Dinodia College is to ensure that the practices followed in the campus are in accordance with the green policy adopted by the institution. The methodology adopted in order to perform the green audit for the college included different approaches and tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis. Further, suggestion and recommendations were formulated based on the collected data and based on standard rules, regulations and literature. The study covered the following areas to describe the present environmental conditions of the campus and its management thereof:-

- i. Land resource and pattern of utilization
- ii. Campus Biodiversity
- iii. Water Quality, Use and Management
- iv. Energy Usage and Conservation
- v. Waste Generation and Waste management
- vi. Campus Cleanliness

4. OBSERVATIONS

4.1. ABOUT THE COLLEGE

Panigaon Om Prakash Dinodia College was established in 1984 after the painstaking efforts of the local people of the area to fulfil the long pending demand for a higher educational institution. Om Prakash Dinodia whole heartedly supported the effort by providing monetary grant for the establishment of the college. The college was provincialized in 1996 and presently affiliated to the Dibrugarh University. In spite of being located in a flood affected area, the college can be reached directly from North Lakhimpur town and Panigaon Chariali. Its location in a lush green campus and the relatively peaceful environment contributes to a calm environment essential for a college.

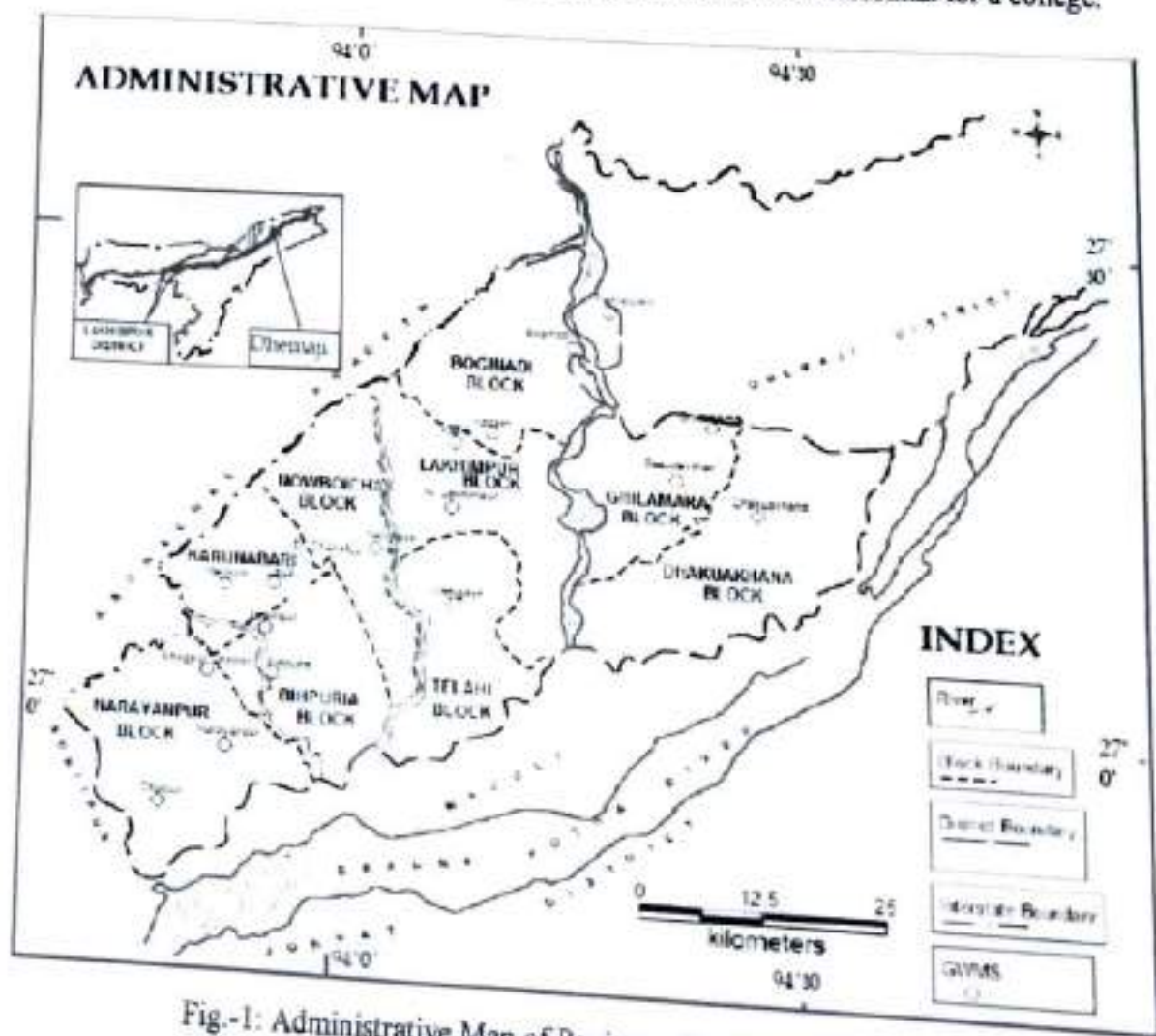


Fig-1: Administrative Map of Panigaon Om Prakash Dinodia College



Fig.-2(a): Satellite map of Panigaon OPD College

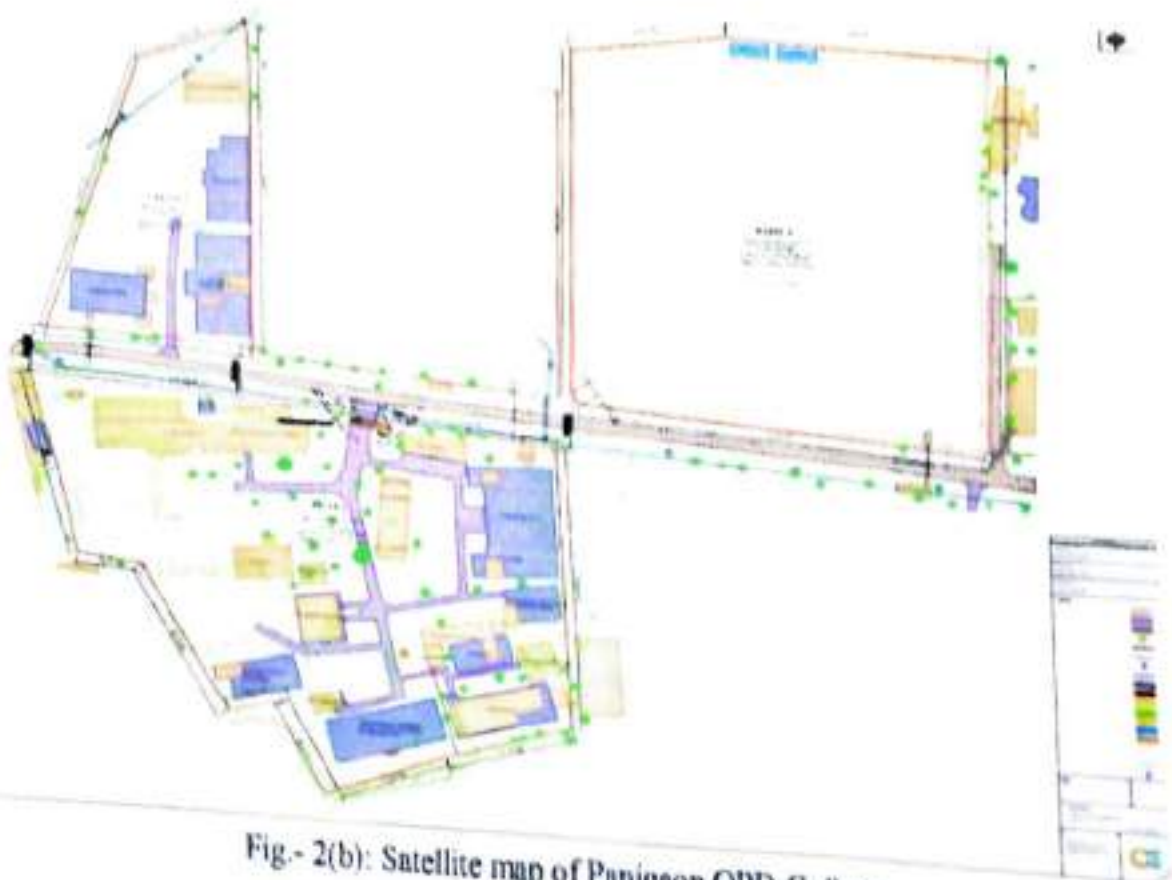


Fig.- 2(b): Satellite map of Panigaon OPD College

The college was envisioned and established as a source and centre for the dissemination of the value of higher education so that its benefits could be reaped by the students from the remote rural community and its adjacent areas. The college is affiliated to the Dibrugarh University and received UGC recognition under Section 2F and 12B of the UGC Act 1956. The college has introduced CBCS courses in its curriculum in the year 2019 and at present the college offers courses only in the arts stream. The college trains the students to be morally sound, socially conscious and intellectually capable so that they are an example and an asset for the society. The college has adapted the latest educational methods in order to provide best system of education required in the world today.

Table-1: The present status of human resources of the college

Sl. No	Human Resources	Permanent	Contractual	Total
1	Teaching Staff	21	02	23
2	Non Teaching Staff	13	02	15
3	Students	---	---	416

4.2 VISION AND MISSION

VISION

To make accessible for all, affordable and excellent centers of higher education in order to create an environment of acquiring academic knowledge and skill development with high social values.

MISSION

To provide affordable but value based and quality education by identifying hidden talents in their respective chosen streams and provide opportunities to realize their full potential in order to shape them into accomplished and capable persons of the country.

4.3 GREEN AND ENVIRONMENT 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 CO₂ emission, energy and water use, while creating atmosphere where students can learn and be healthy.

4.4 GENERAL ENVIRONMENTAL SETTING

Lakhimpur district of Assam is located between 26°48'00" and 27°53'00" (N) and 93°42'00" and 94°20'00" (E). The district is bounded by the Siang and Papum Pare district of Arunachal Pradesh on

the north, by Dhemaji district and Subansiri River on the east, Majuli Sub Division on the south and Gohpur sub-division on the west. Climatologically, the district is characterised as subtropical with high humidity and high rainfall. The average annual rainfall is 3268 mm with as relative humidity of 74%. Lakhimpur district receives the monsoon rainfall from the month of April and continues up to September/October. Northern part of the district which is geographically located at the foothills of Eastern Himalayas, receives the maximum rainfall within the district. The maximum temperature in the district reaches up to 35°C during June / July and the minimum temperature falls to around 8°C in the months of December and January. Based on geology and hydrogeological characteristics, the district has two distinct hydrogeological units-semi-consolidated and unconsolidated formations. The semi-consolidated formation is composed of Neogene Siwalik Group of rocks bordering the northern boundary of the district.

5. LAND RESOURCE AND PATTERN OF UTILIZATION

The term 'land use' refers to the human use of land. In other words, it means the economic as well as the cultural activities like agriculture, residential, industrial, mining etc. activities that are practical at a given place. Therefore, in a broader sense the term land use stands for the socio-economic description (functional dimension) of areas, for various purposes. Panigaon OPD College is covering an area of about 51,643 sq. ft or 22 Bighas. The presence of lemon garden within the campus adds to the beauty of the college which augments the aesthetic value of the college. The college has endowed a total land resource of 55,645 sq.meters out of which 49,646 sq. meters of land have been utilized as mentioned below:-

Table- 2: Land use pattern of Panigaon OPD College

Sl No	Land Use Category	Area (Sq. meter)
1	Build up cover	35000
2	Green Cover	3226
3	Water Body	4000
4	Roads (Pucca)	6179
5	Roads (Kutchha)	240
6	Drainage system	1000
7	Unutilised land	6000

Thus, it is observed that there is space for increasing green cover in the unused areas within the college premise. Considering the gardens, forest, water bodies etc. present inside the college campus, it can be said that the around 30-40% of total area provides a good ecological habitat for a wide variety of flora and fauna which are listed in the following pages.

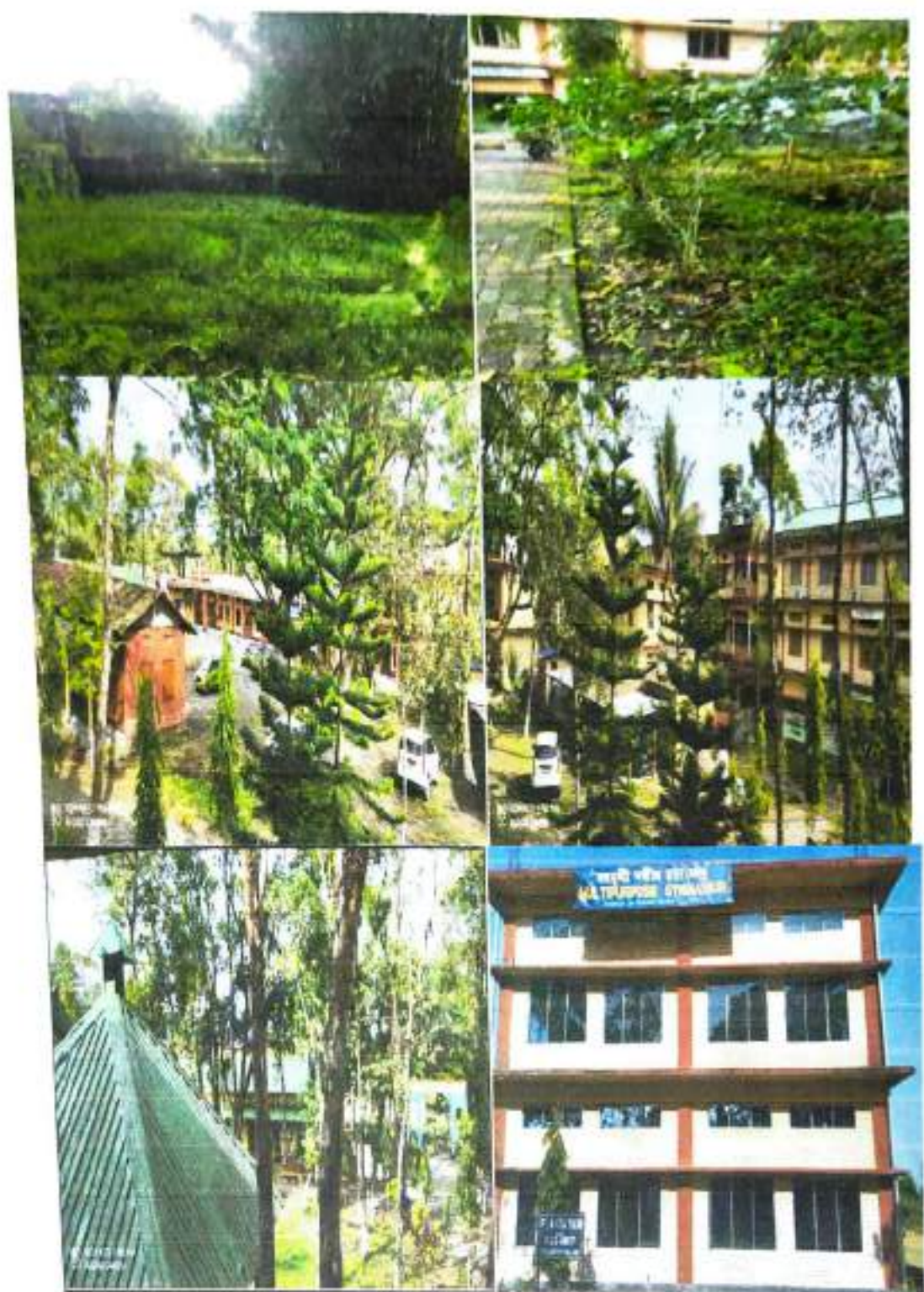
6. BUILD UP ENVIRONMENT

The built -up area of the college is approximately 35000 sq. meters out of the total 55,645 sq. meters of the campus. The administration has utilised a considerable section of the total area for the purpose of fulfilling the academic and the administrative needs. The built up area includes within its fold concrete structures like classroom building, administrative bloc, library etc. to cite a few.

Table-3: Build up area pattern of Panigam OPD college

Sl. No.	Pattern of build up Area
1	Principal's office cum Administrative Block, library, Conference Hall
2	Girls' Hostel
3	Girls common room
4	Classrooms
5	Teachers common room, Computer Room
6	Indoor Stadium
7	Multipurpose gym
8	Canteen
9	Car parking
10	Parking for students







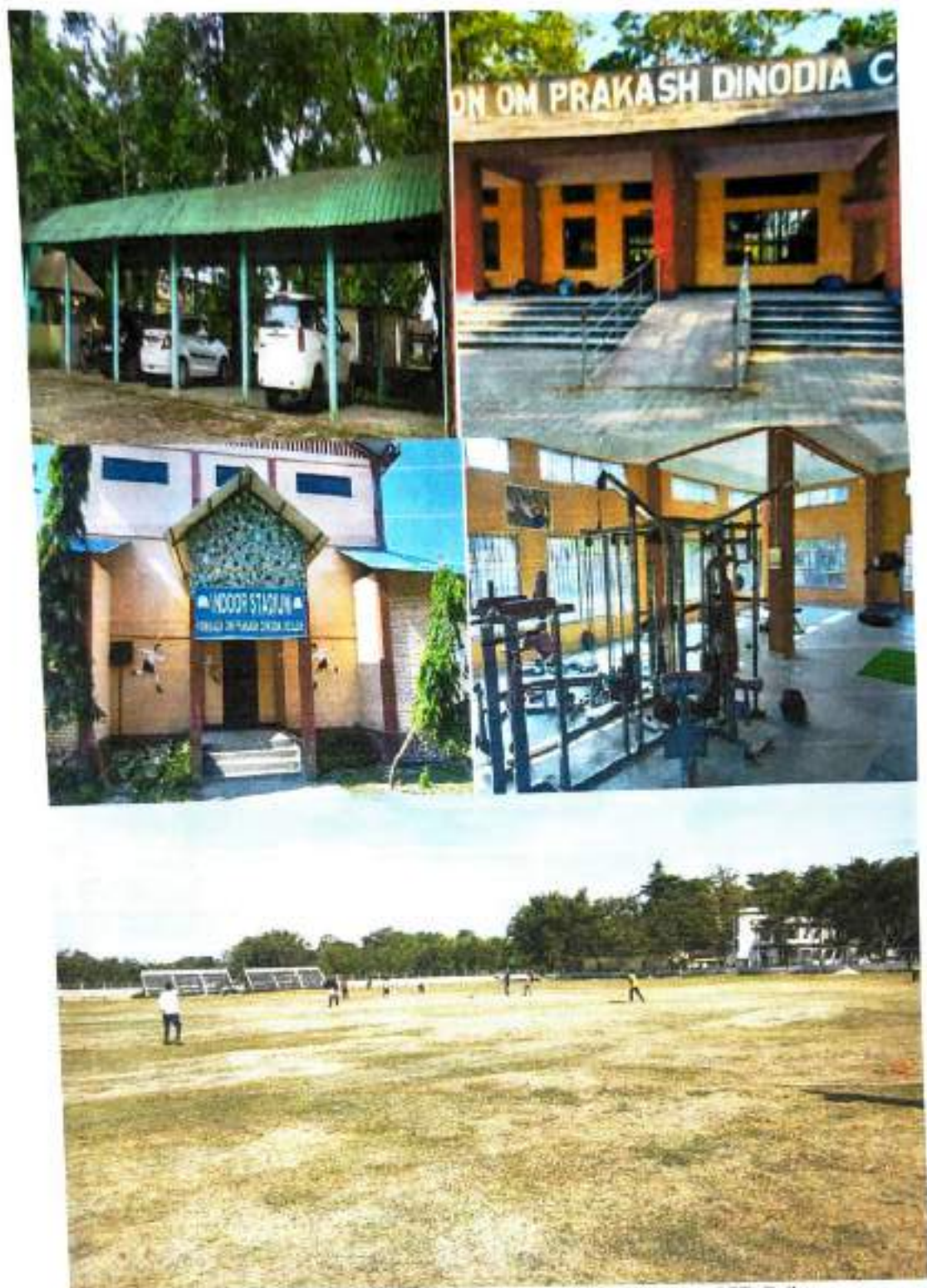


Fig.- 3: Few photographs regarding land use pattern of Panigaon OPD College

7. CAMPUS BIODIVERSITY

The college campus is covered by lush green area which adds to the diversity of Panigaon OPD College. The entire premise of the college is rich in flora and fauna. The trees in the college campus are planted in different periods in various plantation drives carried out in the college premise. These trees have enhanced the quality of life, not only of the college fraternity but also of the native fauna by improving the air quality, climate amelioration, conservation of water, preserving the soil cover, controlling the local climate by moderating the effects of the sun, rain and wind. Trees planted along the entrance to the administrative block enhanced the aesthetic beauty. As such, several species of birds rely on these plants for food as well as shelter. Numerous species of medicinal plants are also being planted in the premise of the the college. Hence, the college has been playing a pivotal role in maintaining the environmental balance of the college as well as of the adjoining area. The following table highlights the various species of trees found within the boundary of the college.

Table-4: Plants in the college campus

Sl. No.	Common Name	Botanical Name	No of Species
1	Deodar	<i>Polyalthia longifolia</i>	15
2	Olive	<i>Elaeocarpus floribundus</i>	2
3	Holokh	<i>Terminalia myriocarpa</i>	1
4	Aamlokhi	<i>Emblca officinalis</i>	2
5	Narikel	<i>Cocos nucifera</i>	3
6	Joba phool	<i>Hibiscus rosa-sinensis</i>	5
7	Acacia	<i>Acacia moniliformis</i>	3
8	Togor	<i>Ervatamia coronaria</i>	4
9	Jestha modhu	<i>Glycyrrhiza glabra</i>	2
10	Mango	<i>Magnifera indica</i>	8
11	Sotiona	<i>Alstonia scholaris</i>	3
12	Pine	<i>Pinus kesiya</i>	4
13	Guava	<i>Psidium guava</i>	5
14	Shisham	<i>Delbergia sissoo</i>	3
15	Bokul	<i>Mimusops elengi</i>	3
16	Hilikha	<i>Terminalia chebula</i>	8
17	Haasi	<i>Aquilaria agallocha</i>	2
18	Rain tree	<i>Samanea saman</i>	14
19	Nabor	<i>Mesua ferrea</i>	3
20	Pusa aamlokhi	<i>Cicca acida</i>	2
21	Palash	<i>Butea frondosa</i>	4

Table 12: Water Use and Conservation

Sl No	Location	Tank No	Capacity (Lit.)	Total Capacity (Lit.)
1	Teachers' Common Room	1	500	500
2	Department of Pol.Science	2	750+500	1250
3	Girls' Hostel	5	1000+500+500+500+500	3000
4	Canteen	1	500	500
5	Gymnasium	2	750+500	1250
6	Administrative Building	1	500	500
Total Capacity (Lit.)				7000



Fig.-4: Source and supply of drinking water in the college campus

22	Khejur	Phoenix dactylifera	3
23	Soom	Persea bombycina	4
24	Pooja	Ehretia Acuminata	2
25	Bor Jamu	Eugenia jambolana	3
26	Bogitora	Alpinia malaccensis	2
27	Krishnasura	Caesalpinia pulcherrima	6
28	Bhelew	Tetrameles nudiflora	4
29	Bortenga	Citrus maxima	3
30	Horu Jamu	Eugenia fruticosa	4
31	Titasopa	Michelia champaka	2
32	Sonaru	Cassia fistula	3
33	Gomari	Gmelina arborea	4
34	Mamoi Tamul	Pinaga gracilis	3

Table-5: Medicinal Plants in the college campus

SL. No.	Local name	Scientific Name	No. plants
1	Mosandari	Rumunculus reniformis	Many
2	Bormani muni	Centella Asiatica	Many
3	Padina	Mentha viridis	Many
4	Duportenga	Bryophyllum pinnatum	6
5	Gul Nemu	Citrus aurantifolia	4
6	Vedailota	Psederia foetida	2
7	Horu manimuni	Centella japonica	Many

8. FAUNAL BIODIVERSITY

Data collected from the college authority and team observation, it has been found that the campus comprises of avian species and invertebrate species like red cotton bug, coleopterian beetels, butterflies, moths, dragonflies etc. Reptiles were also observed in the campus that included oriental rat snake, Indian monitor lizard etc. Apart from these, there were mammal species observed within the campus like squirrel, house mouse, rat, Small Indian Civet etc.

Table-6: List of Avian Fauna

Sl No.	Common name	Scientific Name
1	Cattle egret	Bubulcus ibis
2	Common Crow	Corvus Splendens

3	Cinnamon bittern	<i>Ixobrychus cinnamomeus</i>
4	White Breasted waterhen	<i>Amurornis phoenicurus</i>
5	Common Myna	<i>Acridotheres tristis</i>
6	House Sparrow	<i>Passer domesticus</i>
7	Jungle Myna	<i>Acridotheres fuscus</i>
8	Red Vented Bulbul	<i>Pycnonotus cafer</i>
9	Yellow Wagtail	<i>Motacilla flava</i>
10	Grey Wagtail	<i>Motacilla cinerea</i>
11	White Wagtail	<i>Motacilla alba</i>
12	Coppersmith Barbet	<i>Megalaima haemacephala</i>
13	Bluethroat barbet	<i>Megalaima asiatica</i>
14	Jungle Babbler	<i>Turdoides striatus</i>
15	Yellow footed green pigeon	<i>Treronapicauda</i>
16	Spotted dove	<i>Spilopelia chinensis</i>
17	Pied Myna	<i>Sturnus contra</i>
18	Oriental Magpie Robin	<i>Copsychus saularis</i>

Table-7: List of Invertebrate species

Sl. No	Common Name	Scientific Name
1	Giant Honeybee	<i>Apis dorsata</i>
2	Eastern Honeybee	<i>Apis cerena</i>
3	Hornet wasp	<i>Vespa orientalis</i>
4	Dragonfly	<i>Diplacodes trivalis, Potamarcha congener, Sympetrum fonscolombiete</i>
5	Cabbage butterfly	<i>Pieris rapae, Danaus genutia, Eurema hecabe</i>
6	Spider	<i>Argiope aurantia</i>
7	Red cotton bug	<i>Dysdercus cingulatus</i>
8	Aphid	<i>Aphis sp.</i>
9	Lemon Butterfly	<i>Papilio demolus</i>
10	Lady bird Beetle	<i>Coccinella sp.</i>
11	Ants	<i>Lasius niger</i>
12	Earthworm	<i>Lumbricus sp.</i>
13	Ground Beetle	<i>Carabus sp.</i>
14	Flea beetle	<i>Phyllotreta sp.</i>
15	Leech	<i>Hirudo sp.</i>
16	Termites	<i>Odonototermes obesus</i>

Table-8: Reptiles

Sl No	Common Name	Scientific Name
1	Indian monitor lizard	<i>Varanus bengalensis</i>

2	Common house gecko	Hemidactylus frenatus
3	Bronze grass skink	Mabuyama cularia
4	Brahminy blind snake	Indotyphlops brahminus
5	Checkered keelback	Fowlea piscator
6	Oriental rat snake	Ptyas mucosa

Table-9: List of fishes found in the pond of Panigaon OPD College

Sl No	Local Name	Scientific name
1	Goroi	Channa punctata
2	Sengeli	Channa gachua
3	Kawoi	Anabas testudineus
4	Pathi	Puntius sarana
5	Hingi	Heteropneustes fossilis
6	Kholihona	Trichogaster fasciata

Table-10: List of Mammals

Sl No	Common Name	Scientific Name
1	Lesser bandicoot rat	Bandicita bengalensis
2	House Mouse	Mus musculus
3	Small Indian Civet	Viverricula Indica
4	Squirrel	Dremomys lokhriah

9. DRINKING WATER QUALITY AND CONSERVATION

Drinking water in the college campus is mainly extracted from the groundwater aquifer through deep boring wells and using submersible pumps. The water extracted is used for drinking is collected by individuals from the electrical filters. (Fig 4). Water quality of Panigaon OPD College was analysed by District Level Water Testing Laboratory, PHED, North Lakhimpur on 22-08-2023. Analyses were carried out on samples collected from 4 numbers of sites for 09 parameters (pH, TDS, Turbidity, Total Hardness, Fe, NO₃⁻, SO₄²⁻, F⁻ and Cl⁻) and as per standard procedures prescribed by APHA (1984).

Table 11: Water quality data

Sample ID	Sample Sites	pH	TDS (mg/L)	Turbidity (NTU)	TH ($\mu\text{g/L}$)	Fe ($\mu\text{g/L}$)	NO_3^- ($\mu\text{g/L}$)	SO_4^{2-} ($\mu\text{g/L}$)	F- ($\mu\text{g/L}$)	Cl- ($\mu\text{g/L}$)
S-1	Administrative Building	6.84	121	10.2	75	0.35	6.42	3.819	0.18	16.2
S-2	Girls' Hostel	6.82	98	1.6	45	0.17	2.18	2.18	0.06	18.4
S-3	Teachers' Common Room	7.26	128	11.4	90	0.653	4.27	4.09	0.21	20.2
S-4	Pond	6.74	129	0.8	60	0.21	1.07	0.89	0.04	16.4
Protocol Used		IS:3025: Part 11@25 degree Celsius	IS302 5:Part 16	IS:3025: Part 10	IS:302 5: Part 21	APHA 3500-Fe B	IS:302 5: Part 34	IS:302 5: Part 24	APHA 4500-F D	IS: 3025: Part 32
Desirable Limit		6.5-8.5	500	1	200	1	45	200	1	250
Max Permissible Limit		No relaxation	2000	5	600	No relaxation	No relaxation	400	1.5	1000

Source: Water Testing Report of Panigaon OPD College by District Level Water Testing Laboratory, PHED, North Lakhimpur, Dated. 22-08-2023

The water analyses reveal that the tested water samples were well within the permissible limits for drinking water as set by the WHO (except turbidity). The turbidity level in two analyzed water samples (samples 1 & 3) exceed the WHO drinking water standard (5 NTU). Turbidity in drinking water is measured by determining light transmission using standard light sources and reported in nephelometric turbidity units (NTUs). Turbidity makes water cloudy or opaque. High turbidity increases water temperature due to the particles absorbing sunlight. Higher temperatures of water result in less oxygen content, leading to hypoxic conditions.

Regarding water use and conservation, college campus has a total number of 12 water reservoirs which can store a total of 7000 litres of water as detailed below.

Based on data available it is suggested that the college should test more samples from different locality of the college campus through an agency like PCBA, IASST, IIT etc. for ascertaining the concentrations of health-wise significant parameters like Fluoride, Arsenic, Heavy metals etc. The college has to cater to water needs of a population of more than 454 persons per day. Although the groundwater potential of Lakhimpur district is depicted to be very high as per CWGB reports, yet, the extraction is not recommended for various reasons. Particularly, to avoid geogenic contamination of drinking water due to Arsenic, Fluoride, heavy metals etc., the use of groundwater should be avoided.

10. RAIN WATER HARVESTING PLANT

Electricity consumption can also be reduced if, the number of times the water is being pumped is reduced. This can be achieved by using surface water supply sources like ponds and also through using rain water. The college has started an initiative of one rain water harvesting unit near the Girls' Hostel which is capable of storing 500 Litres. But this facility should be augmented by making arrangement for each and every building and also make provisions for groundwater recharge using the rain water. Such steps will play an important role, if not large, in maintaining the overall water balance in the long run. There is scope for increasing the number of rain water harvesting units.



Fig.-5: Rainwater harvesting units

11. USE OF VEHICLE IN THE CAMPUS

The college has a strict policy of NO HELMET NO ENTRY. There is also a policy of NO HONKING within the premises of the college. Additionally, license check drives are carried out frequently among the students.

Table-12: Vehicle Use Details of Panigaon OPD College Community.

Sl. No	Vehicle Name	Quantity
1	Bi-cycle	130
2	Two wheeler	42
3	Four Wheeler	06

Table-13: Vehicle Audit of Teaching Faculty

Sl. No	Name of Teachers	Departments	Mobile No	Distance from Residence & Fuel Used per day	Vehicle Numbers			Bicycle Used (Yes/No)
					Car-I	Car-II	Two Wheeler	
1.	Dr. Suresh Dutta	Principal	863 829 468 2	14 km & 2 litres	AS07R3 483			No
2.	Mrs Karuna Dutta	Education	943 553 474 1	11 km & 1.5 litres	AS07M 7849			No
3	Mrs. Mina Lahon		985 984 902 7	4 km & 1 litres	AS07E 4443			No
4.	Dr. Runjun Saikia		700 216 292 5	5 km & 1 litres	AS01A W9849			No
5	Bijoy Lakhshmi Das	Assamese	887 651 849 8	0.5 km & 0.5 litres	Nil			No
6	Dr. BD Nisha		910 180	9 km & 1 litres			AS07U8 801	No

			642					
7	Dr. Rakhee Deodhai Phukan		6					
			700 218 867 1	13 km & 2 litres	AS07T 7253		AS06AB 8030	No
8	Mr Tepuram Pegu		763 680 927 0	8 km & 1 litres			AS07B 9903	No
9	Dr Babul Barhoi		910 106 470 1	1.5 km & 0.5 litres			AS07M0 549	No
10	Manas Pratim Khanikar	English	847 292 186 5	14 km & 2 litres	AS07A C8775			No
11	Mrs Banti Bhuyan	Sociology	936 525 461 8	9 km & 1 litres	AS07K 8779	AS07 V811 4		No
12	Miss Gyanashree Kotoki		700 261 282 2	11.5 km & 1.5 litres	AS07A C8775			No
13	Mr Gunjan Dutta	Political Science	875 390 675 3	11 km & 1.5 litres	AS07E 0670			No
14	Mr Devraj Dutta		809 974 120 1	15 km & 2 litres	AS07E 2099			No
15	Mr Jibedhar Nath		700 234 813 0	12 km & 1.5 litres	AS07E 3896			No
16	Mr Jyotish Engti	Economic s	863 828 448 4	12 km & 2 litres	AS07E 3896			No
17	Mrs Kaberi Hazarika		970 731 823 3	12.5 km & 1.5 litres	AS07A C8775			No

18	Mr Joyprakash Bhuyan	History	943 508 620 6	11.5 km & 1.5 litres	AS07D 8185			No
19	Mr Abhinab Nath		967 815 150 2	8 km & 1 litres	AS07V 7454			No
20	Mrs Pinju Maral	Philosophy	700 295 631 9	11.5 km & 1.5 litres	AS07J8 078	AS03 AB74 55		No
21	Mrs Madhurima Dowrah		700 211 213 6	9 kms & 1 litres	AS07B 8700			No
22	Dr Nijara Kalita		739 955 877 7	4 kms & 1 litres	AS07P 9445			No
23	Mrs. Juli Pathak	Sociology	801 132 045 6	4kms &11	AS07A C8775			No

12. CARBON FOOT PRINT ANALYSIS

- Total number of vehicles used by the stakeholders of the college (per day): 178
- No of cycles used by the stakeholders: 130
- No of two wheeler used by the stakeholders: 42
- No of cars used by the stakeholders: 06
- No of persons using public transportation: 07
- No of persons using college conveyance: Nil
- No of generators used per day: 02
- Amount of fuel used: 03 litre
- Number of LPG cylinders used in hostels: 02
- Number of LPG cylinders used in canteen/labs: 02
- Use of any other fossil fuels in the college: None
- Any suggestion to reduce the use of fuel: The concept of car pooling should be encouraged.

13. CAMPUS WASTE MANAGEMENT

Collection and removal of solid waste within the college campus is dumped in low lying areas. About 90% of the solid wastes (plastics, plastic packages, decomposed leaves, dung of animals, empty containers) are burnt to ashes and the rest of the garbage like used batteries, remnants of building etc. are picked up by the rag pickers. Intensive plantation programme is undertaken near the solid waste disposal site. Prior to the commencement of the monsoon season, an immediate cover of 40-50 cm thickness of soil are placed on the landfill to prevent infiltration. After completion of landfill a final cover is designed to minimise infiltration and erosion. Storage facilities are done either in 'bins' or on ground or on a mechanizes container. Maximum percentage of waste is burnt to ashes. The compost from the solid waste is completely a biological process. Segregation of solid waste is undertaken. The anaerobic degradation of leaves, animal dung are placed in pits. This process takes at least six months to use the usable compost. Rag pickers from the local area are called to remove the solid waste.



Fig.-6: Vermicompost units

14. CAMPUS CLEANLINESS DRIVES

The college has undertaken numerous cleanliness programmes through the OPD College Eco club, NSS cell etc. It is worth mentioning that Panigaon OPD College is doing all that needs to be done in pursuing a clean campus and have also strived hard to inculcate the virtue of cleanliness among the students through various activities. The college has conducted many cleaning programmes in tandem with the national flagship programme of Swachh Bharat Abhiyan. The college authority has installed biodegradable dustbins made up of bamboo within the campus apart from the portable plastic dustbin located across the whole campus. Also, appropriate signage motivating cleanliness and displaying college rule with regards to maintaining clean campus was also seen across the campus. Such financial investments indicate the serious approach of the college authority towards maintaining a clean campus.

15. ENERGY USE AND CONSERVATION

Energy crisis is one of the most important environmental issues in the age of Anthropocene. Every individual and organization must strive for conservation of energy and reduce dependence on conventional energy sources. Educational institutes have the moral responsibility towards preaching and practicing the concept of energy conservation. Details of energy consumption of Panigaon OPD College is listed in table-14. The college has installed 5 nos. of solar street lamps, yet it is hugely dependent upon the conventional electricity being supplied by APDCL. The college is spending a large sum of money for electricity bills, which totals to a tune of around *Rs. 1,25,000 per year (based on last financial year data)*. However, considering the open space available in the campus, the college can adopt a comprehensive plan for setting up solar power grid which will help in saving conventional energy as well as finances. The government of Assam has specific solar power programmes. Implementing energy saving techniques ensure that the light and fans are switched off by floor peons and staffs after completion of the last lecture of the day. Classrooms consist of sufficient ventilators and windows so that the use of electricity can be minimized. Usage of rainwater harvesting systems and use of treated water from ponds and wetlands will reduce the necessity of extracting groundwater using electrical water pumps. This will minimize further consumption of electricity and decrease the financial load of the college.

Table-14: Energy consumption in the college campus

Equipment	Quantity	Per day energy consumption (Apprx.)	Total (Watt)
Tube bulb	10	40 w x 10	400 w
AC	10	1.5 kw x 10	15 kw

LED projector			
Xerox machines	03		
Printers	01	150 w x 3	450 w
Computers	05	1 kw x 1	1000 w
LED	20	300 w x 5	1500 w
Fan	35	250 w x 40	10 kw
	130	18 w x 35	630 w
Water Motors		100 w x 130	13 kw
Aquaguard	5	250 w x 5	1.25 kw
Electric Kettle	1	25 w x 1	25 w
	7	1kw x 7	7 kw

From the above chart it is clear that maximum connected load in the college includes all the classrooms, computer lab, conference hall. However, the installation of the solar lights has contributed the conservation of energy.



Fig.-7: Solar street lamps

16. BEST ENVIRONMENTAL PRACTICES

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

- i. The college has installed 5 numbers of solar street lamps. This is a small but a sustainable initiative towards energy conservation. Given the size of the campus, the no. of solar powered lighting and appliances can be increased substantially.
- ii. The college has installed a simple system of rain water harvesting in the Girls' hostel. The rainwater from the rooftop is collected via PVC ducts and stored in a reservoir. This can be considered to be a small experimental initiative, which the audit team recommends to be augmented and replicated for other official and residential units.
- iii. Setting up of the vermicompost unit is another positive step towards environmental sustainability which will contribute to reduction in the use of the chemical fertilizers. The demand for this eco-friendly product is increasing day by day. As such the college authority should focus on increasing the output by increasing the vermicompost units.

The audit team recognizes the Green Club and the NSS Unit of the college as the most active and important component with respect to development of environmental management plan of the college. The extra-curricular environmental activities performed by the Green club and the NSS Unit are--

- i. Plantation Programmes
- ii. Environment Awareness Programmes
- iii. Celebration of environmentally important days -- World water day, Earth day, Environment day, etc.

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

Table-15: Environment Awareness Programme

Sl No	Date	Initiative taken by	Location
1	05/06/2017	World Environment Day NSS Unit and Green Club	College premise
2	11/01/2018	Swach Bharat Abhiyan by NSS unit	College premise
3	05/06/2018	World Environment Day by NSS Unit and Green Club	College premise
4	01/08/2018-15/08/2018	Sachhata Pakhwada under the NSS Unit	College premise
5	05/06/2019	World environment Day under the Green Club	College premise
6	01/08/2019-15/08/2019	Sachhata Pakhwada by the NSS Unit	College Campus
7	19/08/2019	Seuj Dharitri Abhiyan under Green Club and the NSS Unit	College premise
8	05/06/2020	World Environment Day under the Green Club	College premise
9	05/06/2021	World Environment Day under the Green Club	College premise
10	30/11/2021	Training program of Youth on Clean village and Green Village under Nehru Yuva Kendra in collaboration with Udayan Yuvak Sangha	Lakhimpur Kendriya Mahavidyala
11	05/06/2022	World Environment day cum Plantation Drive under the Green Club	College premise
12	02/08/2022	Cleanliness Programme under the NSS Unit	College premise
13	29/09/2022	Cleanliness drive as part pf the Swacchata India Campaign	College premise, Veterinary college campus, College tiniali etc.
14	20/11/2022	Plantation Programme by the NSS Unit and Yuva Tourism Club	College premise
15	15/03/2023	Shram Day by NSS Volunteers	College premise
16	05/06/23	World environment Day cum sale of organic products UBA and NSS Unit	College premise



44X5+PCX, Pani Gaon, Assam 787052, India
 Latitude 27.148931666666666° Longitude 94.10893333333334°
 Local 12:01:06 PM Altitude 50 meters
 GMT 06:31:06 AM Wednesday, 15/04/2023



44X5+PCX, Pani Gaon, Assam, India
 Latitude 27.148931666666666° Longitude 94.10893333333334°
 Local 12:01:06 PM Altitude 50 meters
 GMT 06:31:06 AM Wednesday, 15/04/2023



Pani Gaon, Assam, India
 44X5+PCX, Pani Gaon, Assam 787052, India
 Lat 27.148932° Long 94.108931°
 05/06/23 01:04 PM GMT +05:30



Pani Gaon, Assam, India
 44X5+PCX, Pani Gaon, Assam 787052, India
 Lat 27.148932° Long 94.108931°
 05/06/23 01:04 PM GMT +05:30



Pani Gaon, Assam, India
 44X5+PCX, Pani Gaon, Assam 787052, India
 Lat 27.148932° Long 94.108931°
 05/06/23 01:11 PM GMT +05:30



Pani Gaon, Assam, India
 44X5+PCX, Pani Gaon, Assam 787052, India
 Lat 27.148932° Long 94.108931°
 05/06/23 01:09 PM GMT +05:30

Fig.- 8: Few photographs regarding environment awareness programmes of Panigaon OPD College

17. AUDIT RECOMMENDATIONS

In view of the facts and figures found by the Environment Audit committee and the experts the following suggestions are offered to the college :-

- I. More plantations is needed to increase the green coverage of the campus.
- II. The college needs to devise more effective measures for disposing solid wastes and e-wastes.
- III. The college should generate more power from the non-conventional energy sources reducing its dependence on the electricity provided by the Assam Power Distribution Corporation Limited.
- IV. Effective measures should be taken for scientific management of water resources particularly rain water and ground water.
- V. The college authority should try to develop programs to engage more students across all departments in various environmental activities apart from those who are NSS members. The activities taken up by these units should continue and carried out regularly.
- VI. The college authority should set up an empowered cell/committee or entrust the IQAC for establishing rules and norms within the campus so as to comply with various rules implemented under the Environmental Protection Act, 1986 and its subsequent amendments.
- VII. Inculcate discipline and sense of participation in the energy conservation movement, any unnecessary lighting during day period should be avoided through awareness programmes.
- VIII. Intensive monitoring/inspection in order to ensure the minimum use of artificial light.
- IX. It is recommended that all luminaries should be converted to energy efficient LED as an Energy conservation measures.
- X. Installation of master switches outside in each room which will help to switch off all electrical appliances during non-working hour.
- XI. Tubular daylight devices to maximize the use of daylight which will reduce the energy consumption

18. CONCLUSION

Green and environment audit is one of the most efficient ways to identify the strength and weakness in strategies and approaches of making an organization environmentally sustainable. Green audits can 'add value' to the managing environmental risks (known and unknown). Green and environment audit is one of the most important activities that come under the NAAC assessment. It is a mandatory activity which can go a long way in making an educational institution truly sustainable. Based upon

the data provided by the college authority, it can be apprehended that there is scope for further improvement, particularly in relation to management of water and energy resources as well as that of waste. The recommendations in this report highlight many ways in which the college can work to improve its actions and become a more sustainable institution.

19. ACKNOWLEDGEMENT

The green audit team members hereby offer acknowledgement to the Panigaon OPS College for entrusting us the task of carrying out the Green Audit of the college. We offer our special gratitude to Dr. Suresh Dutta, Principal, Panigaon OPD College for his kind help and cooperation. We also sincerely thank Dr. Babul Barhoi, Coordinator IQAC, Panigaon OPD College. We also sincerely thank all the teaching and non-teaching staff and students of the college who had helped us in collecting data and providing inputs necessary for this study.

20. REFERENCES

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Water Quality Testing Reports-I

APPENDIX-I



ADDRESS: OFFICE OF THE EXECUTIVE ENGINEER (PHED) NORTH LAKHIMPUR DISTRICT
AN NABL ACCREDITED LABORATORY (CERTIFICATE NO. TC 10714)
Email ID: laboratoryplp555@gmail.com Ph. No. 4966609477/4966609478



TEST REPORT

Test Report No: PHED/NLPHED/2023-24/226

Issue Date:

22/08/2023

UIN No

Sample 1: TC 10714220000012616
Sample 2: TC 10714220000012716
Sample 3: TC 10714220000012816
Sample 4: TC 10714220000012916

Issued To:

Gunjan Dutta

Sample Collected on Dated:

17/08/2023

Sample Received on Dated:

17/08/2023

Sample Description:

Drinking Water

Sample Location:

Parigason GPO College
Telahi, Panigason

Sample Type:

DTW (Deep Tube Well)

Sample Quantity:

1.5L

Date of Analysis Started:

17/08/2023

Sample Collected by:

Gunjan Dutta

Date of Analysis Completed:

19/08/2023

Sl. No.	Parameter	Protocol Used	Results				IS: 10500:2012 (Second Revision)		Unit
			Sample (1)	Sample (2)	Sample (3)	Sample (4)	Desirable limit	Max Permissible limit in absence of better alternate source	
1	pH	IS: 3025 Part 11 @ 25 °C	6.94	6.82	7.20	6.74	6.5 - 8.5	No relaxation	ph Units
2	Total Dissolved Solids	IS: 3025 Part 16	121	98	128	125	500	2000	mg/L
3	Turbidity	IS: 3025 Part 10	10.2	1.6	11.4	0.8	1	5	NTU
4	Iron	APHA 3500 - Fe B	0.35	0.17	0.53	0.21	1	No relaxation	mg/L
5	Fluoride	APHA 4500 - F D	0.18	0.06	0.21	0.04	1.0	1.5	mg/L
6	Chloride	IS: 3025 Part 32	16.2	18.4	20.2	16.4	250	1000	mg/L
7	Total Hardness	IS: 3025 Part 21	75	45	90	60	200	600	mg/L

Opinion: The Parameter Tested at Sl. No 3 of sample No.(1,3) in the test report does not meet the requirements of IS 10500:2012 (Second revision)

The Parameter Tested at Sl. No. (1,2,4,5) of sample No.(1,2,3,4,5,6,7) in the test report meet the requirements of IS 10500:2012 (Second revision)

The Parameter Tested at Sl. No. 3 of sample No. (2,4) in the test report meet the requirements of IS 10500:2012 (Second revision)

Notes:

- The results given above are related to the sample as received and tested in this laboratory. Reliability of sample lies with the sender.
- The test report cannot be regenerated/re-produced in whole or in part without written permission of Laboratory.
- The test report cannot be used for any publicity or any legal purpose.
- 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 the customer for retaining over a longer period.

Authorized By:
M. D. S.
Quality Manager/Asstt. Chemist
North Lakhimpur, DLI (PHED)
North Lakhimpur
Quality Manager, PHE
North Lakhimpur DLI

END OF TEST REPORT

Water Quality Testing Reports-II

DISTRICT LEVEL WATER TESTING LABORATORY, NORTH LAKHIMPUR
Address: Office of the Executive Engineer (PHE), North Lakhimpur Division
North Lakhimpur

Test Report

Test Report No. PHE/10 A/04/2023/12/12
Issued To: Ganjan Datta
Issue Date: 21/08/2023
Sample collected on date: 17/08/2023
Sample Type: D/W Deep Tube Well
Sample Description: Drinking Water
Sample Location: Karkasa GPO College, Taluk, Panskani
Sample Quantity: 500 ml
Sample received on date: 17/08/2023
Date of Analysis started: 17/08/2023
Sample Collected by: Ganjan Datta
Date of Analysis Complete: 18/08/2023

Sl. No.	Parameter	Protocol Used	Results				IS: 10600:2012 (Second Revision)		Unit
			Sample (1)	Sample (2)	Sample (3)	Sample (4)	Desirable limit	Max Permissible limit (in absence better alternate method)	
1	Sulphate	IS 3025 Part 24	3.819	2.18	4.08	0.85	200	400	mg/L
2	Nitrate	IS 3025 Part 24	5.42	2.18	4.77	1.07	45	No relaxation	mg/L

IS: 10600:2012 (Second Revision)

Opinion: The Parameter Tested at Sl. No (1,2) of sample No. (1,2,3,4) in the test report meet the requirements of IS 10600:2012 (Second revision)

Notes:

- The results given above are related to the sample as received and tested in this laboratory. Reliability of sample lies with the sender.
- The test report cannot be re-generated or produced in whole or in part without written permission of Laboratory.
- The test report cannot be used for any publicity or any legal purpose.
- The test samples meant for chemical analysis will be disposed of after 15 days from the date of issue of test report unless otherwise requested by the customer for retaining over a longer period.

Authorized by



Quality Manager/Asst. Chemist
North Lakhimpur, DL (PHE)
North Lakhimpur

Quality Manager, PHE,
North Lakhimpur, D.L.

END OF TEST REPORT

Green Club, Panigaon OPD College

No POPDC/P6/2021/10302

Date 17/08/2021

ORDER

A 'Green Club of Panigaon OPD College' has been formed in order to promote the environmental issues of the College campus as well as surrounding areas. The Coordinator is requested to prepare a detail action plan for environmental protection and preservation including plantation, waste management, water conserving, conservation of energy, vermicompost etc. and submit the same to the Principal within 10th September/2021 for consideration of implementation.

1. Dr. Suresh Dutta, Principal
2. Mr. Biren Gogoi, Vice Principal
3. Dr. Robin Saikia, HoD, Political Science
4. Mr. Jay Prakash Bhuyan, Programme Officer, NSS
5. Mr. Jibedhar Nath, Coordinator, IQAC
6. Dr. Runjun Saikia, Coordinator, Green Club
7. Shri Anup Kalita, GS, Students Union
8. Three NSS Volunteers to be nominated

Bruno
Principal 17/8/2021
Panigaon OPD College
Panigaon, Lakhimpur
Principal
Panigaon OPD College
Panigaon, Lakhimpur

Received
Shree
25/08/21

Sri Anuphalita