GREEN AUDIT REPORT

Presented for :

SVPCET

Presented by :

Ecologix Consultancy

Contents

ACKNOWLEDGEMENT

Energy, Environmental & Green Audit Assessment Team thanks the management of St. Vincent Pallotti College of Engineering and Technology, Nagpur for assigning this important work of Audit. We appreciate the cooperation to us Team for completion of study.

Our special thanks are due to

- Dr.Fr.Paul M.Chandrankunnel- Director SVPCET.
- Dr.Vijay M.Wadhai-Principal SVPCET.
- Dr. Nitin Dhote, Dean-IQAC SVPCET
- Dr. Ghanshyam Boob, Co-ordinator- IQAC SVPCET

For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

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DISCLAIMER

Audit Team has prepared this report for St. Vincent Pallotti College of Engineering and Technology, Nagpur based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this reporthave been compiled in good faith based on information gathered. It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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CERTIFICATE OF GREEN/ ENVIRONMENT AUDIT

This is to certify that Ecologix Consultancy conducted a green/ environment audit from 1-3 September 2025 for the academic year 2025-26 for St. Vincent Palloti College of Engineering and Technology, Nagpur. The initiatives taken for green/ environment campus were found to be satisfactory.

We appreciate the immense efforts taken by staff and students towards green campus and environment conservation initiatives.

Place: Nagpur

Date: 13.09.2025

For Ecologix Consultancy

Authorized Signatory

1.0 Introduction

Energy, Environmental & green audit is one of major parameters for institute development. These parameters covered under criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects." Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. 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-inquiry 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.

1.1 About Institute

St. Vincent Pallotti was a Catholic priest who founded the Society of the Catholic Apostolate (SCA), commonly known as the Pallottines, around 150 years ago. Born on April 21, 1795, Pallotti was canonized in 1963. His commitment to his apostolate led him to start orphanages, night schools and technical institutions that exist even today. Besides, he had special compassion for prisoners, soldiers and the sick. He was also the spiritual director of several Roman Colleges. The society founded by Pallotti has numerous institutions in 46 countries across the globe. In India, the Pallottines have premier educational as well as institutions of higher learning in Maharashtra, Goa, Chhattisgarh, Madhya Pradesh, Delhi, Jharkhand, Bihar, Tamil Nadu, Karnataka and Kerala. The Nagpur Pallottine Society Nagpur, which manages St. Vincent Pallotti College of Engineering & Technology, is a part of this International Society.

St. Vincent Pallotti College of Engineering & Technology established in 2004, is one of the premier institutes in central India. The college, managed by the Pallottine Fathers, aims to provide quality technical education to the students of the region and nation. The college offers undergraduate programs in Mechanical Engineering, Electrical Engineering, Electronics & Telecommunication Engineering, Computer Engineering, Information Technology , Civil Engineering and two Post Graduate programs in CAD/CAM and CSE. Two undergraduate programs viz, Electrical Engineering. And Computer Engineering are accredited by National Board of Accreditation. The institute is also a centre for higher learning & research in Mechanical Engineering approved by RTM, Nagpur university.

1.2 Details of Programme/ Level

The programmes offered by the college at different levels are U.G., P.G. and Certified courses. Details of programmes offered by the college is as below

Sr.no.	Course / Program	Intake per Year
01	Mechanical Engineering	60
02	Electrical Engineering	60
03	Computer Science & Engineering	120
04	Electronics & Telecommunication Engineering	60
05	Information Technology	60
06	Civil Engineering	60
07	Computer Science & Engineering (Data Science)	60
08	Artificial Intelligence	60
09	Computer Science and Business Systems	60
10	Computer Science & Engineering (Cyber Security)	60
11	Industrial IOT	60
12	Robotics and Artificial Intelligence	60
13	PG- M Tech (Big Data Analytics)	12
14	PG- M Tech (Automotive Technology)	12
15	PG- M Tech (Power Electronics and Power Systems)	12
16	PG- M Tech (Embedded Systems and VLSI Design)	12
17	PG -M Tech (AI-ML)	12
18	B-Voc	120

The college has organized national conference and International conference, seminars and state level workshops. The students are also reciprocating by their high achievements in academic performance.

1.3 Location of College

The college located at Gavsi Manapur, Wardha Road, Nagpur, Maharashtra India. The college is located with urban area community.

2.0 GREEN AUDIT/ENVIRONMENT AUDIT

2.1 Introduction

The main objective of the Environment/Green audit is to promote the management and conservation of Environment in the College Campus. The purpose of the 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:

- Green Plantation and Plant Diversity
- To document the water analysis report of the college
- To document the waste disposal system
- To document the ambient environmental condition of air, soil and noise of the college

2.2 Methodology

In order to conduct the green audit, the methodology included different tools such as

- Preparation of questionnaire,
- Preparation of data collection formats
- Collection of data
- Physical checking of the campus,
- Observation and review of the documentation,
- Interview of key persons and data analysis, measurements and recommendations.

The study covered the following areas to summarize the present status of environment management in the campus:

- Green area management
- Waste management
- Ambient environmental condition of air and noise

2.3 Building Survey:

- **Total campus area**: 64628 square meters.
- **Total Built up area**
  - Block A: 9454 square meters
  - Block B: 12831 square meters
  - Workshop: 1112 square meters
  - Canteen: 177 square meters
  - Boys Hostel Block A: 4958 square meters
  - Boys Hostel Block B: 3219 square meters
  - Fathers House: 975 square meters
  - Security cabin and ATM: 168 square meters

- Building Area: 32895 square meters.
- Ground Area: 64345 square meters.
- Green Area: 15000 square meters.
- Terrace Area: 5094 square meters.
- Number of Class Rooms: 30
- Number of Laboratories: 37
- Number of Tutorial Rooms: 09
- Number of Halls/Seminar room: 05
- Number of Faculty Rooms: 29
- Water filters with aqua guard and RO: 10
- Water coolers: 10
- Number of Fire Extinguishers: 30 spread over the campus along with Fire Hydrant system
- Evacuation facilities are in place
- Maps are provided at each floor with evacuation facilities and location of Fire Extinguishers.
- Classrooms with sufficient cross ventilation and light.
- Laboratories with safety instructions and measures.
- Number of AC's: - around 54 no of units with 153 ton of air conditioning
- Source of water supply :- Tube well and open well
- water tank capacity :- around 2,00,000 litres
- Drinking water tank capacity:- 10000 & 12000 litres

2.4 Green Audit

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyse the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and Exxon Valdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have

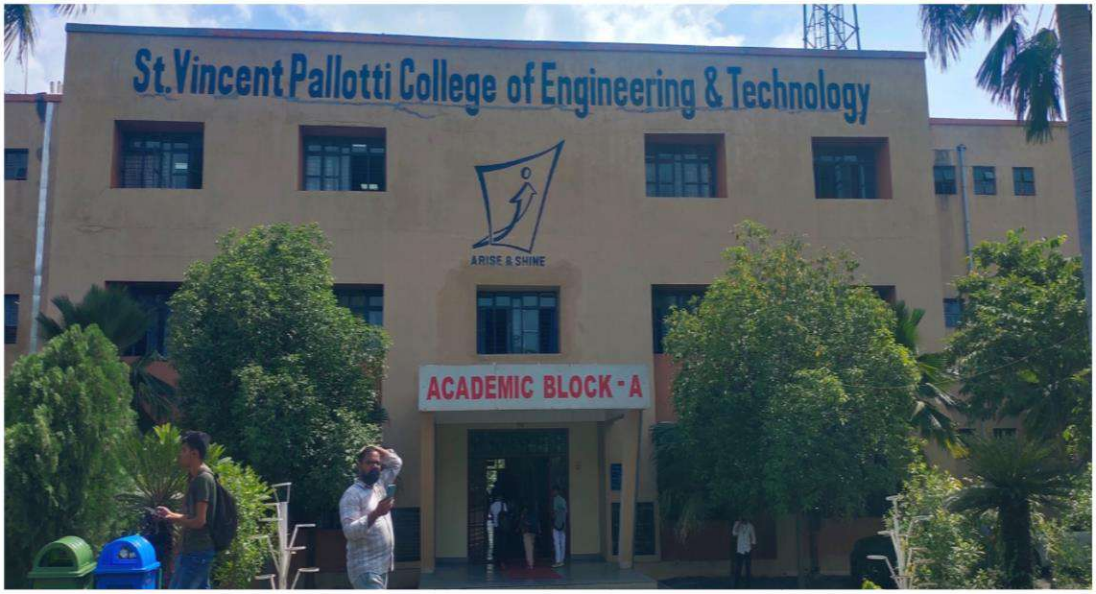
no meaning until they are implemented. The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmentally friendly institute.

2.5 Green Area Plantation

Green area or plantation includes the plant, greenery and landscaping of the campus to enhance the environment of the area. This will help to increase the beauty of the campus. The college area is diverse with a variety of plant species performing a variety of functions. Most of the plant species are planted through various plantation programs organized by the college. The plantation in college have increased the quality of life, not only in college campus but also the surrounding area in term of temperature control, contributing to improving air quality, soil conservation, water conservation and habitat for birds and small animals etc.

Greenery at College Building

Greenery at College Building



Greenery at College Building

Greenery at College Building

2.6 Plant Diversity

- Total 1173 plant species are observed in the college campus area.
- College conducted and participated in various Planation activity programs are being organized at college campus and surrounding villages through NSS unit.
- This program conducted through the students and helps in encouraging eco-friendly environment which provides pure oxygen within the campus and awareness among nearer villagers.
- The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.
- College actively participated in 2 Cr tree plantation programme of Government of Maharashtra.

Sr. no.	**Botanical name of tree**	**Common name**	**Family**	**Number on tree**
1.	Azadirachta indica	Neem	Meliaceae	277
2.	Caesalpinia bonducella	Karanj(karambal)	Caesalpiniaceae	188
3.	Borassus	Sindi Palm	Arecaceae	68
4.	Roystonea regia	Royal Palm	Arecaceae	98
5.	Jacranda mimosaefolia	Gulmohar	Bignoniaceae	24
6.	Thuja occidenfalis	Vidya	Cupressaceae	80
7.	Albizzia odoratissima	Chichwa	Leguminosae	77

8.	Dalbergia sissoo	Sheesam	Fabaceae	18
9.	Anthocephalus cadamba	Kadam	Rubiaceae	20
10.	Plumeria alba	Champa	Apocynaceae	54
11.	Emblica officinalis Gaertn	Awala	Euphorbiaceae	10
12.	Bauhini racemosa	Sona	Fabaceae	13
13.	Citrus sinensis	Orange	Rutaceae	13
14.	Citrus limon	Lemon	Rutaceae	13
15.	Achras sapota	Chikku	Fabaceae	9
16.	Murraya koen	Kadipatta	Rutaceae	11
17.	Tectona grandis	Teak	Lamiaceae	13
18.	Ficus glomerata	Umbri	Moraceae	10
19.	Livistona rotundifolia	Table Palm	Arecaceae	22
20.	Mangifera indica	Mango	Anacardiaceae	150
21	Psidium guajava	Amrut	Myrtaceae	5
			Total	**1173**

2.7 Recommendations:

- Plants that show vigorous growth, and higher forage value are planned in campus
- Plants having ability of fixing nitrogen is to be more planted
- Preferably indigenous, endemic and rare species is to be used in campus
- One Student one plant schemes or any other promotive functions should be arranged to improve awareness in students and society.
- Conduct small workshop or training programme for the students on medicinal plants
- Establish Environment Policy for the environment conservation and protection of college.
- The Environmental cell shall be the source of advice and guidance to staff and students on how to implement this, Policy.
- Conduct six monthly internal audit to ensure that implementation of activities for the environment planned for the year, action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as “Environment Day”, wildlife week and plant trees on this day to make the campus Greener.
- Establish Green library for the students.
- Prepare five-year plantation programme /Plan in consultation with management and students.

- Establish nature club

3.0 Waste Management

3.1 Hazardous and non-hazardous waste management

The institute puts in conscious efforts to enhance and nurture the Eco-friendly environment on the campus by managing all types of waste. The institute has waste management system is place.

3.1.1 Solid waste management

Solid waste is managed by cleaning staff assigned at different locations in institute. The dustbins are placed at various locations including classrooms and laboratories. The waste generated is segregated at each level and source. The institute has a contract with an authorized vendor who collects the waste from the designated place, segregates, recycles and disposes at the landfills authorized by the government.

- Solid waste such as glass, plastic and Iron waste is segregated and sold to vendor.
- Paper & plastic waste is shredded through shredding machine available in institute and given to vendor for further recycling.
- Used sanitary napkins are disposed through incinerator machine installed in girl's washroom in both Academic Block A & B
- Concrete waste is used in land filling.
- Bio-degradable garden waste is decomposed in pit and used as manure.
- The lawn grass which is cut for its maintenance is also used to produce compost.
- Paper shredder machine is to cut sheets of paper into either strips or fine particles.

3.1.2 Liquid waste management

Sewage waste

Sewage from Girls hostel is treated through Sewage Treatment Plant (STP), established in the year 2023-2024 with a capacity of 250 KLD (kilo litre per day).The treated water is utilized for the gardening purpose. The different stages of processing waste water are channelizing of waste to a common place, Screening, Aeration, Biological treatment(MBBR), Desludging, Filtration(DMF+ACF), Disinfection and Storage. It is established in the year 2023-24 in the capacity of 250 KLD. The Boys Hostel waste water (from bathroom, kitchen etc.) is channelled to a storage tank of capacity 150,000 litres and is utilized for the gardening purpose, which also provide basic manure requirement of the plants.

Laboratory waste

Chemistry Lab: Waste fluid from chemistry lab is diluted acids & alkaline liquids. Quantity of waste water is 50 litres per day and dilute chemical reagents is 5 litres per day. These waste liquids are collected in a tank & percolated in soak pits. There is no harm caused by these liquids to aquatic habitat or trees. However, this liquid waste is generated only in 1st Semester (only 3 months). Waste lubricating oils generated in chemistry lab in 2nd semester are used for lubrication of machines in workshop.

Fluid Mechanics Lab: This Lab in Mechanical Department utilizes 3000 litres of water. This water is reused through channels for lab work leading to no water wastage.

3.2 Bio gas plant

Biomass energy, or "Bioenergy", is energy produced from recently living organisms. There are three forms of Bioenergy available with today's technology: heat, fuels, and electrical power. Bioenergy, primarily in the form of heat, has been produced from thousands of years by direct combustion of biomass. For most of the operations, direct combustion is the only practical means of harnessing Bioenergy. For some select types of operations, anaerobic digestion and gasification of biomass are also practical Bioenergy technologies for on-site use.

There are two Hostels in St. Vincent Pallotti college of Engg. & Technology, Nagpur campus. In boys' hostel for cooking the food, there is requirement of 19KG cylinder after every 2 days.

The cost of 19KG cylinder is around Rs. 1600/-. The monthly consumption of LPG gas in the hostel is 22-23 cylinders i.e,418 to 438 KG of LPG. The availability of LPG cylinder is also a problem in a city like Nagpur; college has to face problems during the shortage of LPG Gas .
To overcome this difficulty, the idea of use of Biogas emerges and thinking towards it started.

There are references of use of kitchen waste for production of methane in various literature so, we also tried to produce methane by anaerobic fermentation of kitchen waste of hostel kitchen. The hostels average food wastage generated is approximately 40 KG/day.
The details are as under

Fixed Dome type Bio gas plant (Deenbandhu) Technical Assessment	
6m³ size Bio waste treatment plant:	***10m³ size Bio waste treatment plant:***
✧ Waste treatment capacity - 20-25 Kg Solid waste ✧ Waste water - 100-200 Litres ✧ Space required for installation -50 m² ✧ Gas generation per day - 3-4 m³ Bio gas ✧ Liquid fertilizer - 50-75 Litres per day, utilises as manure for garden ✧ Annual Biogas generation - 1080-1440 m³	✧ Waste treatment capacity - 30-40 Kg Solid waste ✧ Waste water - 200-300 Litres ✧ Space required for installation -75m² ✧ Gas generation per day - 4-5 m³ Bio gas ✧ Liquid fertilizer - 50-100 Litres per day, utilises as manure for garden ✧ Annual Biogas generation - 1400-1800 m³
Investment :- 25000/-	**Investment :- 75000/-**

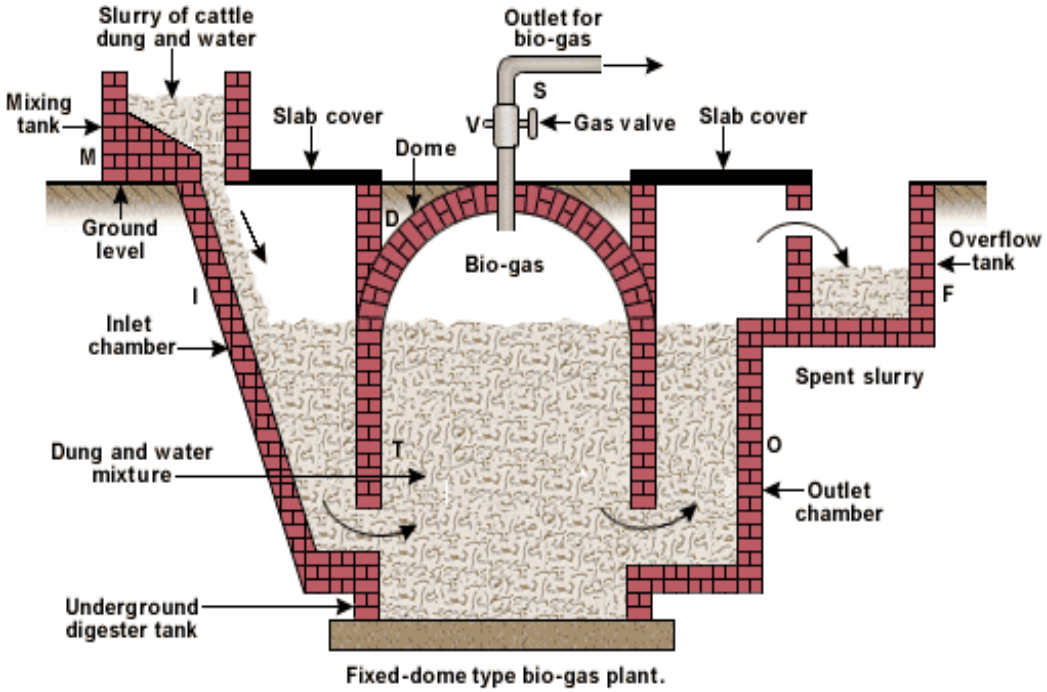


Fig. 8.Bio Gas Plant

Fixed Dome Type Biogas Plant (Deenbandhu), Actual site at SVPCET Campus

TABLE Various characteristics of 10m^3 and 6 m^3 with kitchen waste has shown in Table.

Characteristics	10 m^3 Digester Biogas plant size	6 m^3 Digester Biogas plant size
Capacity	Upto 30 kg kitchen Waste	Upto 20 kg kitchen Waste
Quantity of gas produced	Upto 1 kg biogas capable of replacing 250 gms LPG	Upto 1 kg biogas capable of replacing 250 gms LPG
Used under cooking purpose	Either Tea, Breakfast or pea, beans, vegetables, one meal can be cooked entirely on biogas.	About 2-3 hrs of cooking (tea, breakfast, and snakes) can be done.

3.3 Water management and Water Harvesting

- Institute has created rainwater harvesting facility in the campus by building network of conduits and pipelines spread over the campus .The wells are charged by water flowing from catchment area and rooftops of the buildings. Benefits derived through this system are used for tube well recharging and which has led to remarkable rise in water table.
- Institute have the provision of rain water harvesting and recycling plant in the campus. Recycling plant is in girl's hostel.
- The institute have drip water irrigation system spread over 2500 running meters .
- An amount of Rs 17,85,896/- is spend on Rain water harvesting, pipe line work and tube well recharging in the year 2017-18.
- Considering average rainfall of 1092 mm in Nagpur region, around 60 lakh litres of water is harvested by the institute annually.

Rainwater harvesting potential from	Rooftop area
Block A	3000 square meters
Block B	2940 square meter
Total	**5940 square meters**

Calculation of Rainwater harvesting

- (Roof top area in square meter) X (Total annual rainfall in mm) X (efficiency coefficient/ runoff coefficient)
- (5940) X (1092) X 0.9 =5837832 litters = @ 60 lakh litres of water is harvested by institute annually.
- The institute also having drip irrigation system spread around 2500 running meters area

4.0 Ambient environmental condition of air and noise

4.1 Air Quality

Ambient air quality monitoring was carried out in the college campus to understand the air quality of the campus. Ambient air quality monitored at centre of the campus Air quality was measured by SMILEDRIVE Portable Air Quality Pollution Meter. The results are given below Table

Parameter	Unit	Result	NAAQ Standards for 24hrs
PM10	µg/m3	43	100
PM2.5	µg/m3	19	60

Remark:- The results show the concentrations of PM10 PM2.5 were found within the National Ambient Air Quality Standards (NAAQ).

4.2 Noise Level Campus

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:

- Loudness
- 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 up to 65 dB is considered tolerate. Loudness is also expressed in sones. One sone equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibrations per second. It is denoted as Hertz(Hz).

Noise Level is measure by MECO 970p(35dB-130dB) Digital sound level meter.

Sr no.	Description	Location-College Main Building
1.	Max in dBA	61
2.	Min in dBA	56

5.0 Conclusions

- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and nontoxic, even when this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Gardens should be watered by using drip/sprinkler irrigation system to minimize water use.
- The college makes a significant effort to act in an environmentally responsible manner and takes into account the environmental effects of the majority of its activities.
- To increase awareness amongst the students, staff and local societies for 3R principle and conservation of water and energy.
- Biodegradable solid waste should be converted to manure by composting using composting methods/ vermicomposting technology.
- Single Use Plastic (SUP) should be banned in campus.
- Use of paper cups for drinking tea/ coffee should be banned in campus as these cups are coating with thin laminates of plastic to withstand it and the hot drinks when poured into the cups tend to dissolve with the beverages leading to consumption of microplastics. According to the research studies, some researchers also found chemical species in such drinks which are precursors of cancers.
- Flow rate of taps should be checked; it should not be more than 2.5 litres/minute.
- Establish an E-waste collection centre in campus.
- Green building guidelines for future expansion projects of the campus.
- Adoption of Environmental Policy.
- University to carry dense afforestation (Miyawaki Forest) on its vacant land of various departmental campuses. This may add more greenery to the campus as well as act as an oxygen bank.