

CRITERION 7

INSTITUTIONAL VALUES AND BEST PRACTICES

7.1 Institutional Values and Social Responsibilities

7.1.6 Quality audits on environment and energy are regularly undertaken by the institution.




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7.1.6.1 The institutional environment and energy initiatives are confirmed through the following:

S.No.	Year	Particulars
1	2023 - 2024	Energy Audit, Environment Audit and Green Audit
2		Clean & Green Campus Recognition / Awards
3		Environmental Promotional Activities

ENERGY AUDIT REPORT OF



DON BOSCO COLLEGE OF ARTS AND SCIENCE
A CHRISTIAN MINORITY, CO-EDUCATIONAL, SELF-FINANCING COLLEGE | AFFILIATED TO MANONMANIAM SUNDARANAR UNIVERSITY, THIRUNELVELI.
KEELAERAL, ETTAYAPURAM TK, THOOTHUKUDI DT - 625908, TAMILNADU, INDIA.



Report Prepared By



Department of Mechanical Engineering,
National Engineering College(Autonomous),
K.R Nagar, Kovilpatti
Thoothukudi-628503.

2022




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NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution Affiliated to Anna University, Chennai)
K.R.Nagar, Kovilpatti - 628 503, Thoothukudi Dist., Tamilnadu.

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TO WHOM SO EVER IT MAY CONCERN

This is to certify that the Department of Mechanical Engineering of our institution, below mentioned faculty members of our institution, conducted energy audit at Don Bosco College of Arts & Science, KeelaEral, Thoothukudi during the month of April 2023 and the recommendations to conserve energy is given in the report. I thank the management of Don Bosco College of Arts & Science, KeelaEral for providing the opportunity and I also appreciate the efforts made by the energy audit team.

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GIST

1. Average power consumption of Don Bosco College of Arts & Science is Rs.37000/- per month in 2022.
2. Major power consumption of connected load is Fans, which is 22% of the overall connected load.
3. Out of all blocks in Don Bosco College of Arts & Science for connected load Block A consumes 65% followed by Block C, Hostel block.
4. As an easy picking, by replacing older electric choke tube light with LED tube light, savings per year is about Rs. 84,753/- with return on investment of 3 months.
5. As a low hang fruit, by replacing older fan with super fan, savings per year is about Rs. 1,74,762/- with return on investment of 26 months.




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Faculty Members Involved in Energy Audit:

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Assistant Professor / Mechanical Engineering
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Special Thanks:

Our Special thanks to **Dr. M. Sivasankari**, Assistant Professor, department of Computer Application and **Mr. S. Enigo**, Assistant Professor, department of English, Don Bosco College of Arts & Science, KeelaEral, Thoothukudi for their valuable support in this audit.




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1.0 INTRODUCTION

1.1 About NATIONAL ENGINEERING COLLEGE, Kovilpatti

National Engineering College, Kovilpatti, Tamil Nadu offers a wide variety of high-quality education and training opportunities for every student, awarding qualifications through highly reputed Anna University. The college offers six undergraduate and six postgraduate programs in a wide range of disciplines and is approved by AICTE and accredited by NBA & NAAC. NEC is sprawled in a lush green campus, with an alluring backdrop of an enchanting hillock, in NH44 between Madurai and Tirunelveli. The institute provides an excellent locale for academic pursuits in south Tamil Nadu.

1.2 About Don Bosco College of Arts & Science

Don Bosco College of Arts & Science, Keela Eral, Thoothukudi, Tamil Nadu offers high-quality education to the youth, particularly the under privileged of Thoothukudi awarding qualifications through Manonmaniam Sundaranar University, Tirunelveli. The college offers 7 courses altogether: 6 undergraduate courses and 1 postgraduate course. DBCAS aims to provide an environment in which all students feel safe and happy and are able to develop to their full potential. The college atmosphere caters for the needs of all students through a curriculum that is responsive to individual student needs. Our curriculum is engaging and challenging, aimed at developing a holistic personality and is delivered by competent and caring teachers, supported by sympathetic structures and policies.

1.3 ABOUT ENERGY AUDIT

The building sector has gained prominence over the past few decades as the largest consumers of energy. 45% of total global energy is used in heating, cooling and lighting of buildings. Energy consumption patterns could be substantially altered by adopting energy conserving measures, particularly during the phase of building design. Hence energy requirement to the building is need of the hour for the institutions, this might be the first step in achieving the green audit to the campus.




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2.0: ENERGY AUDIT

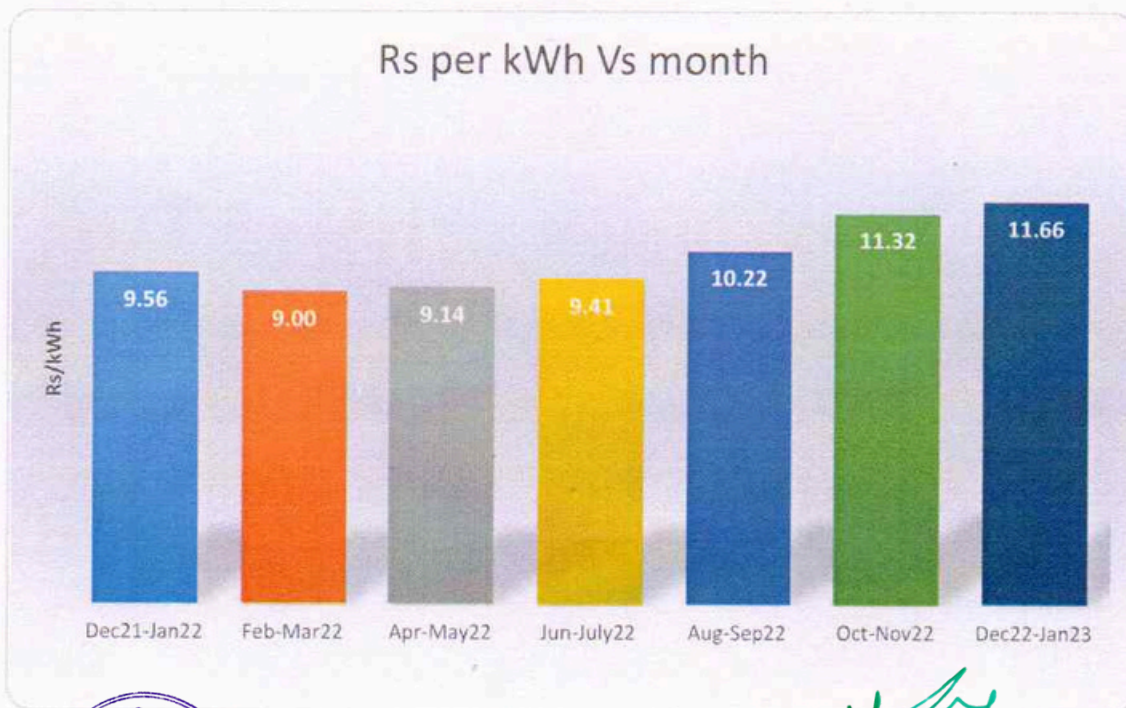
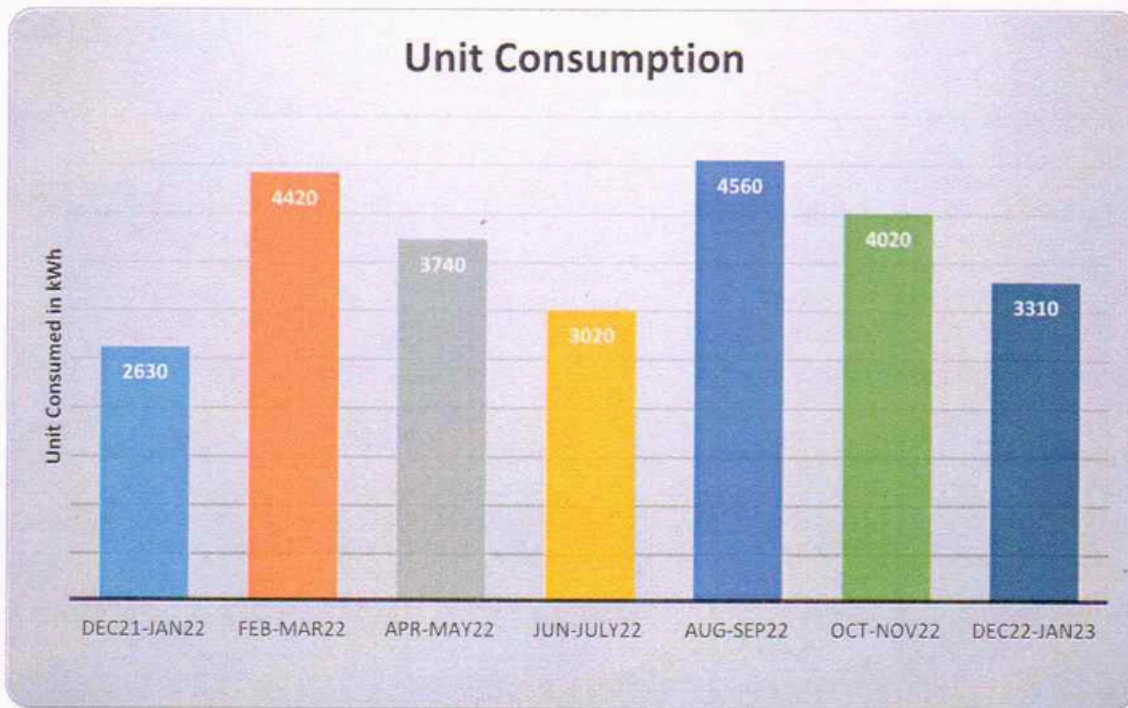
The area of the energy audit includes

- Class Rooms
- Faculty Room
- Laboratories
- Office Rooms
- Seminar Halls
- Hostel
- Canteen
- others



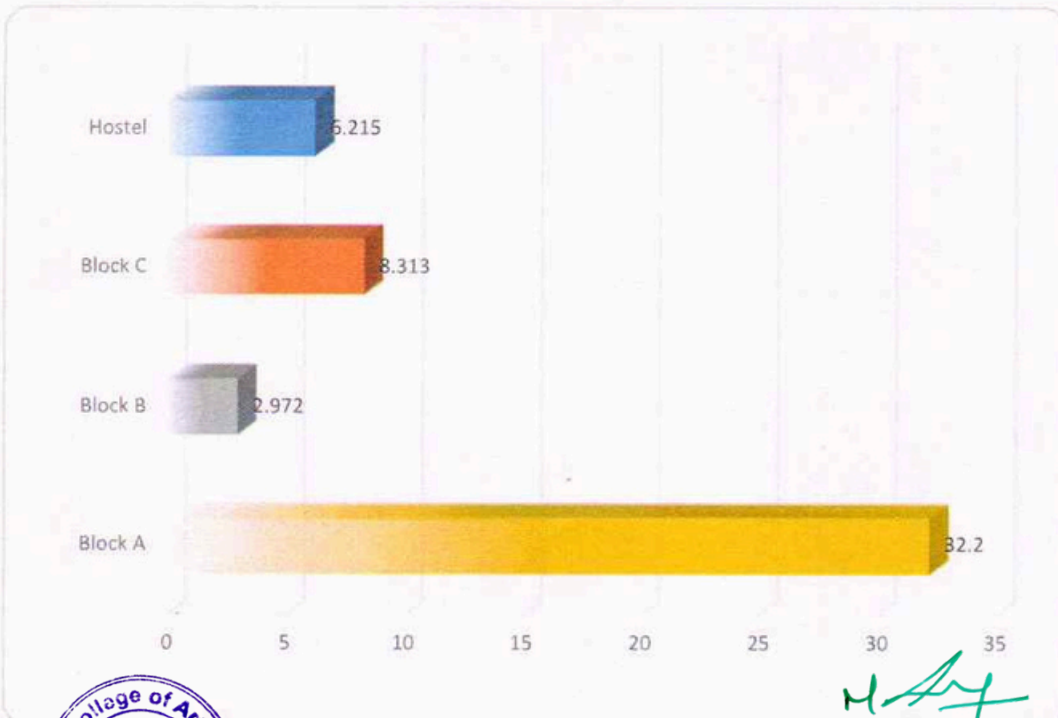
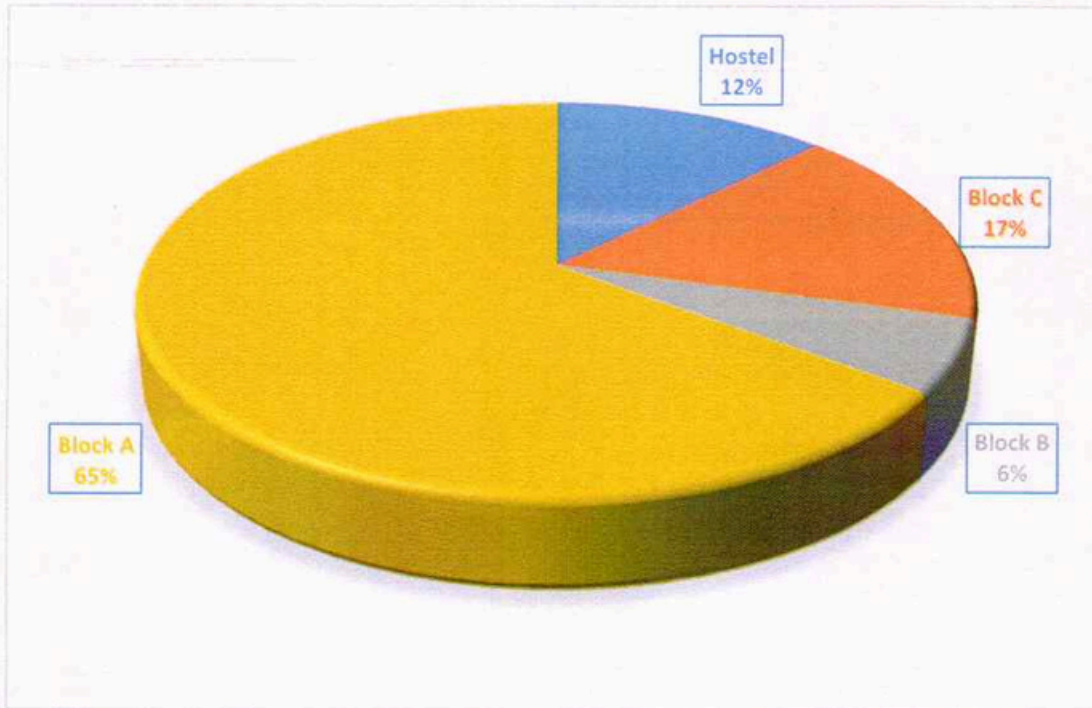

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2.1 Power Consumption Pattern for the year 2022



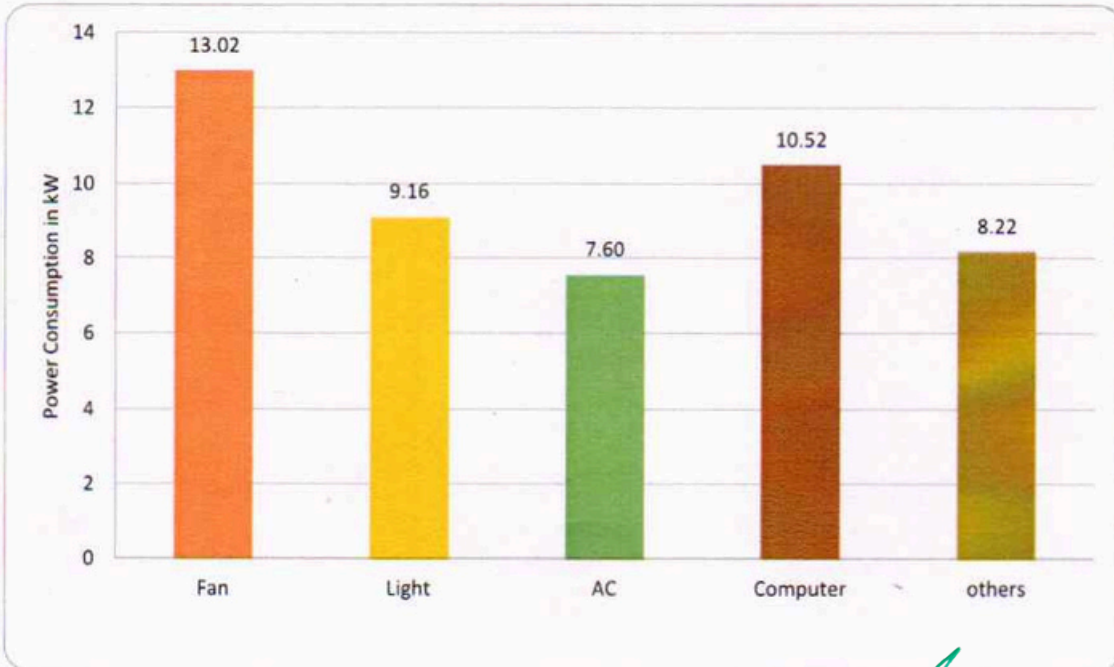
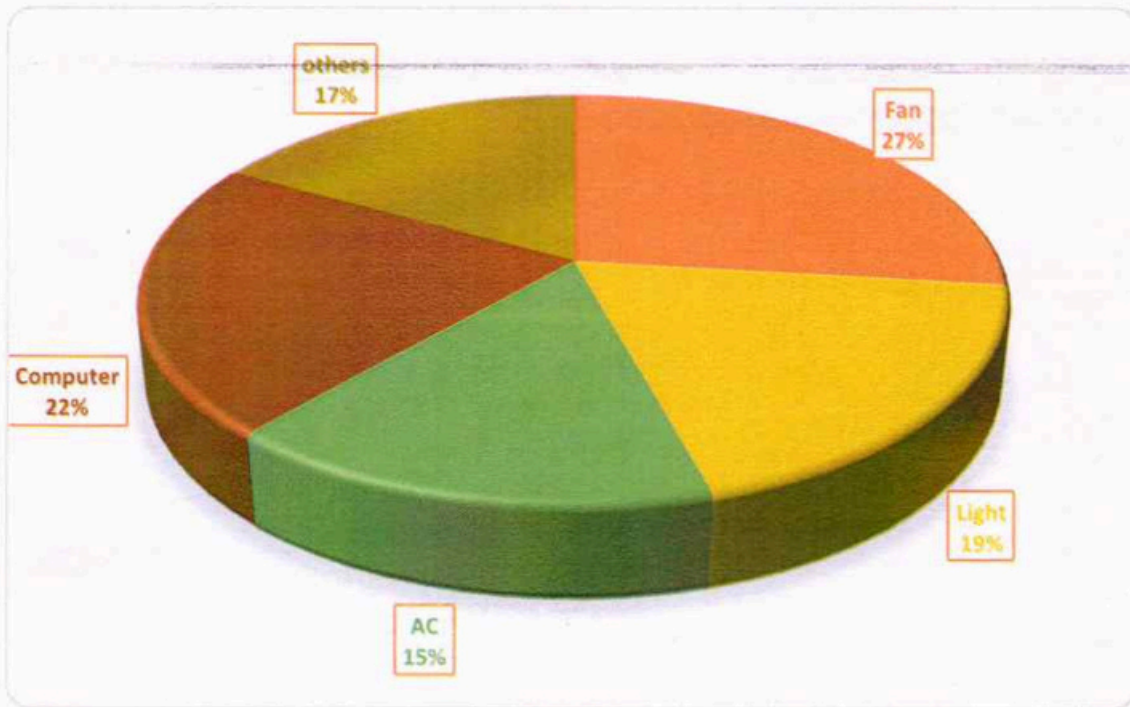
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2.2 Connected load distribution



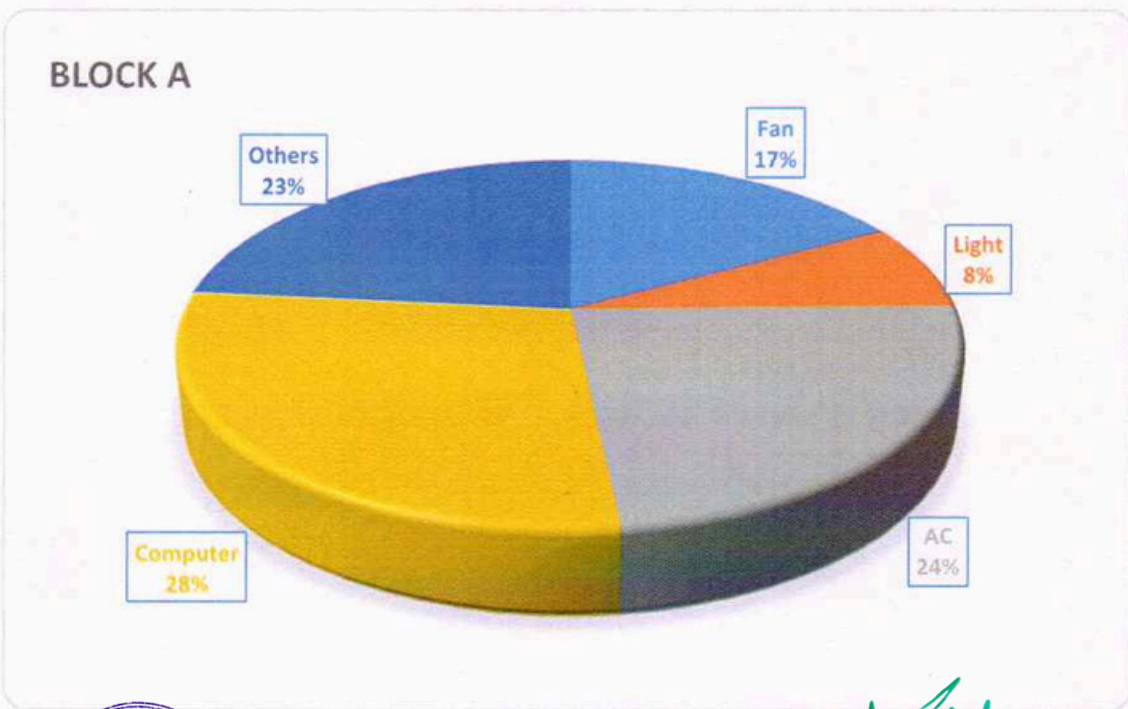
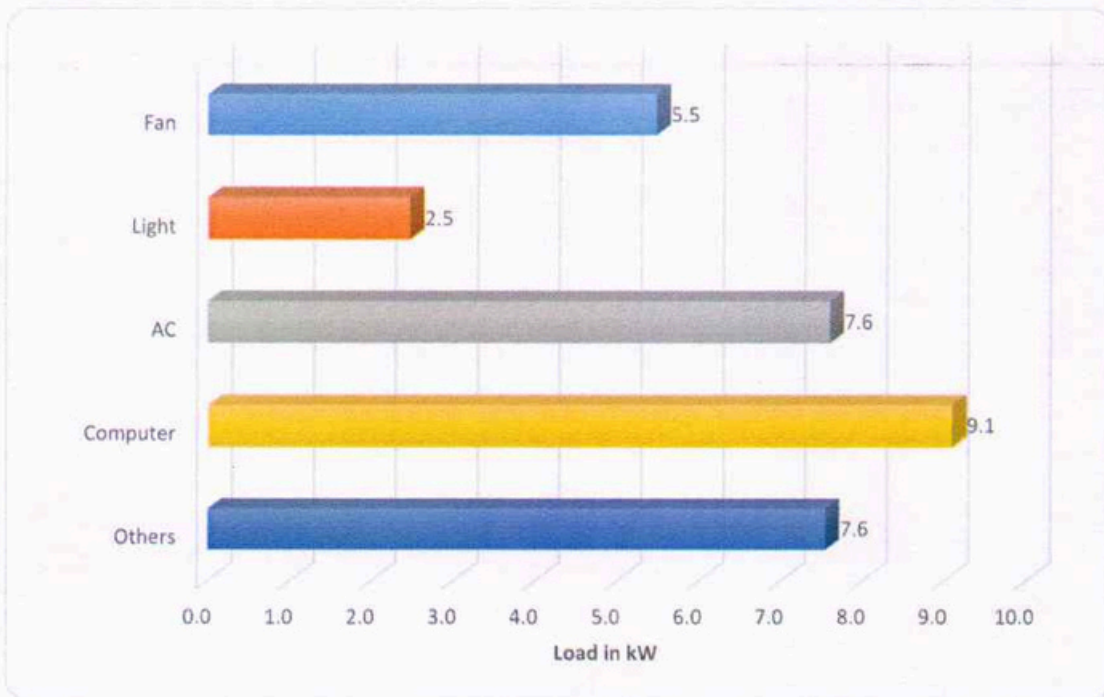
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2.3 Connected load distribution - category wise



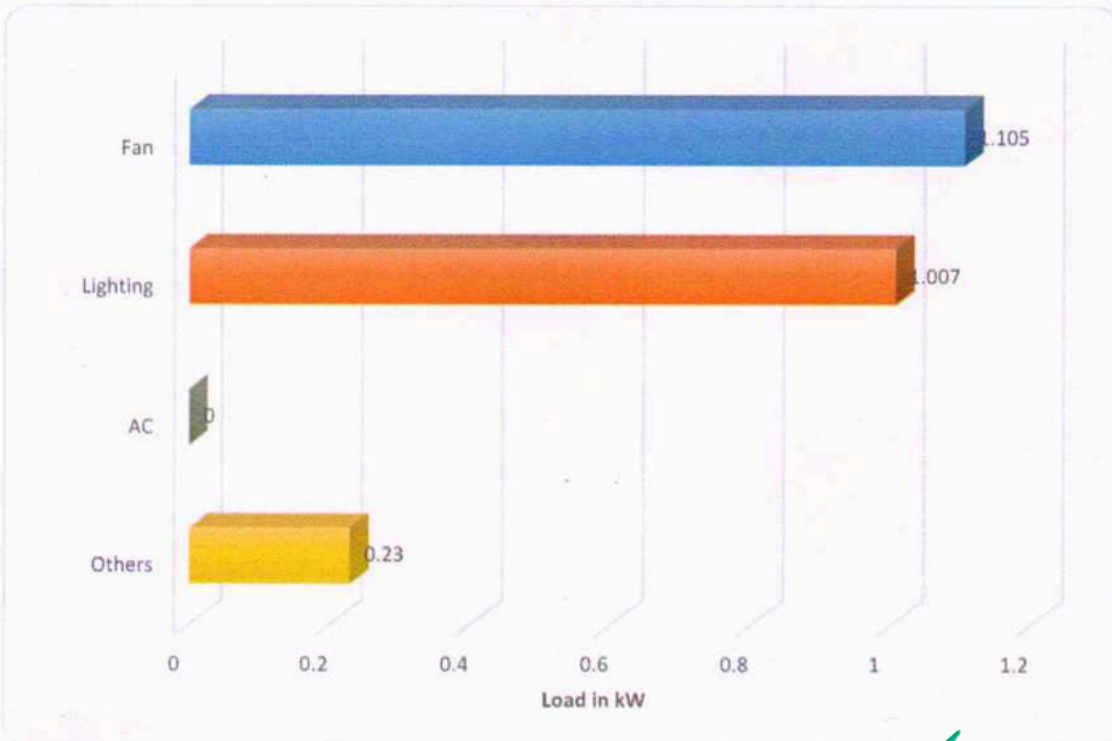
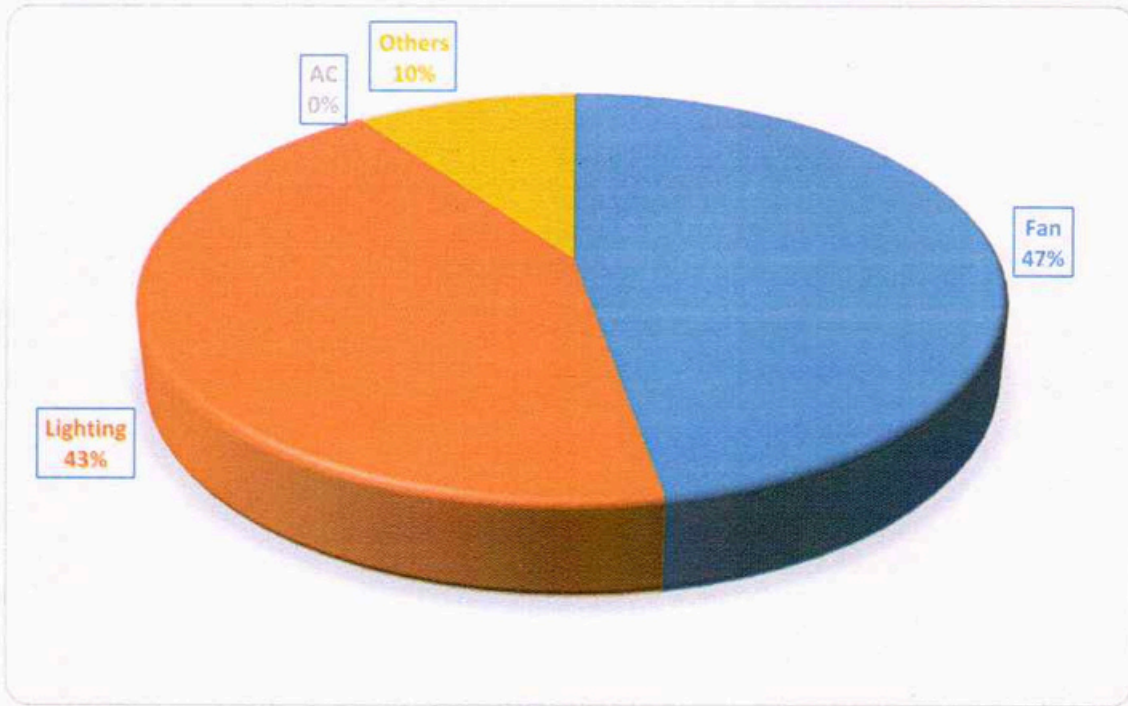
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2.4 Connected load distribution for Block A



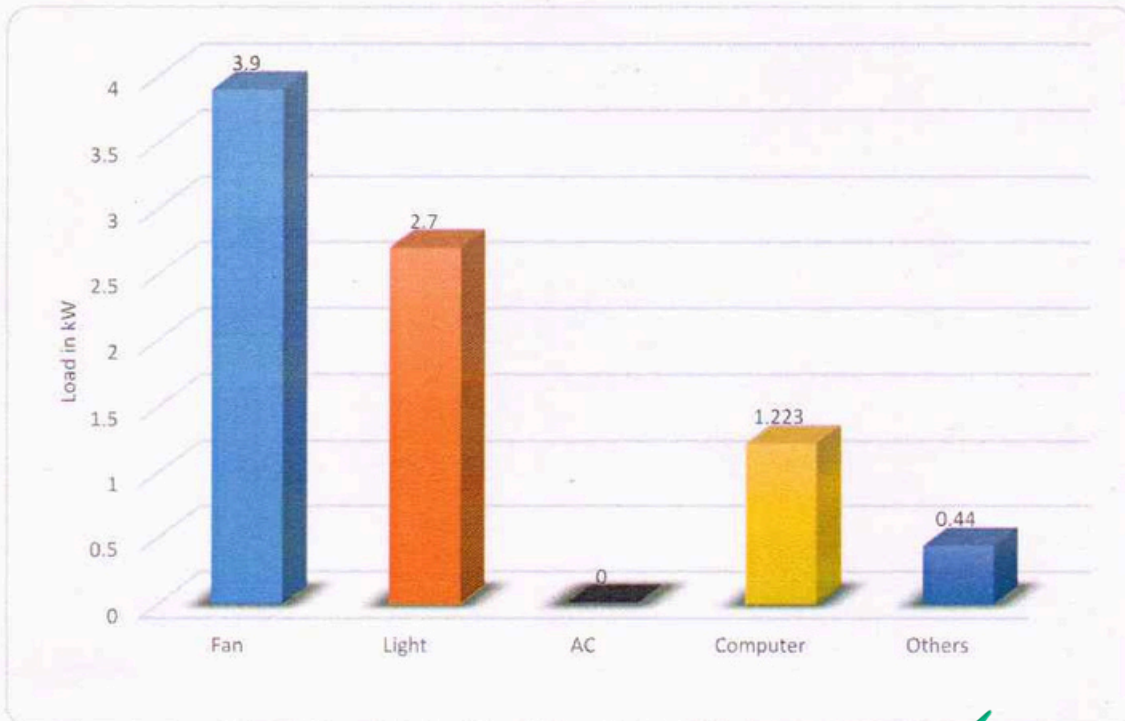
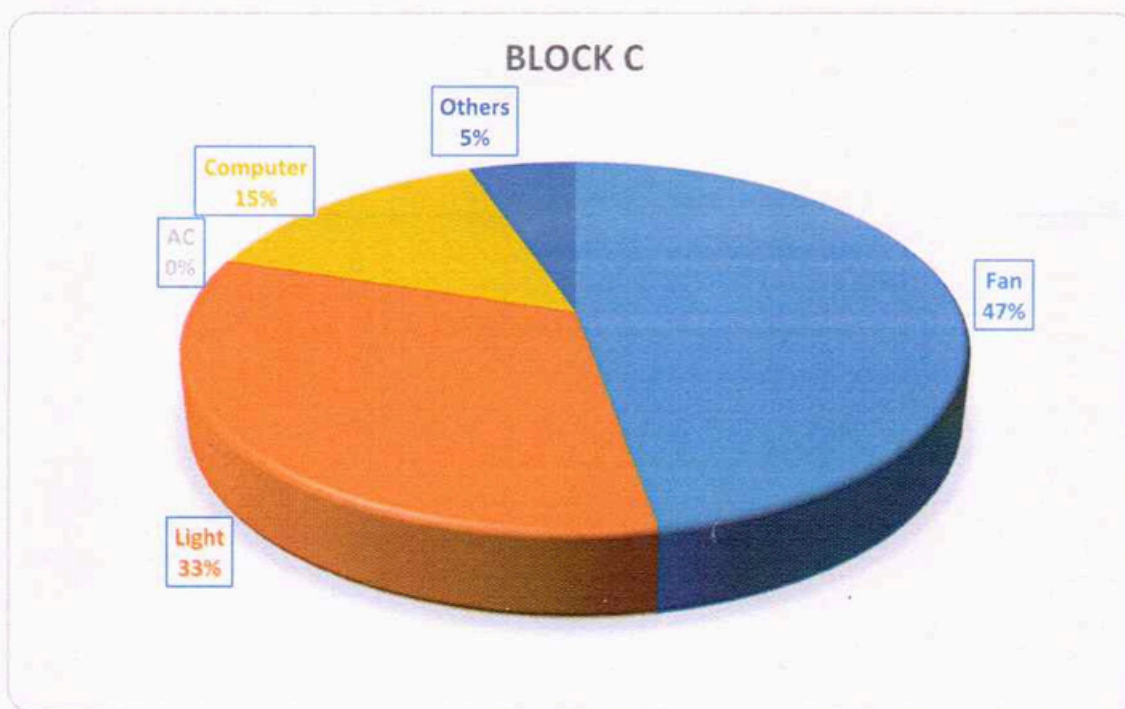
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2.5 Connected load distribution for Block B



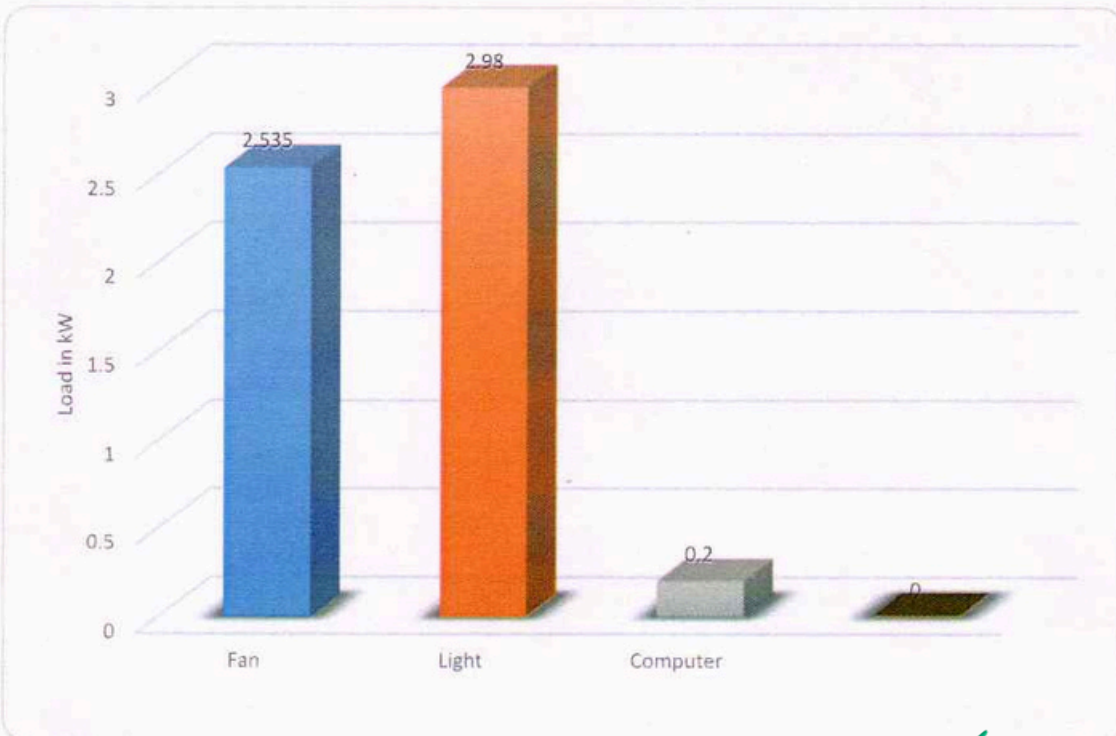
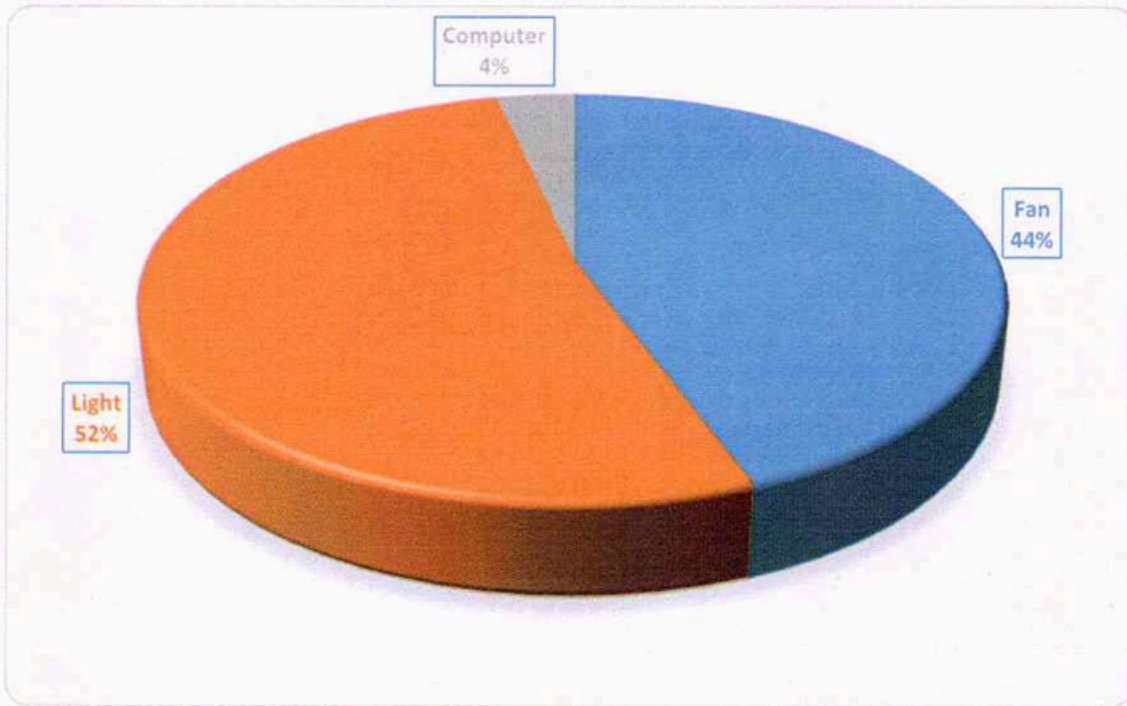
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2.6 Connected load distribution for Block C



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2.7 Connected load distribution for Hostel Block



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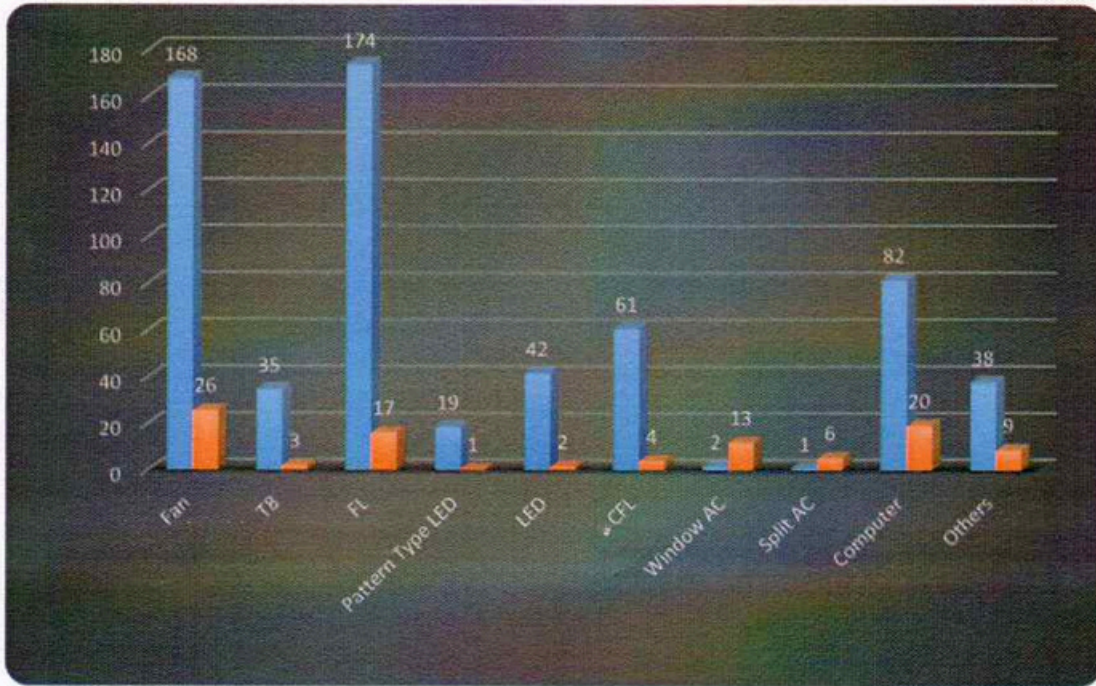


Figure: Number of Components in Don Bosco Arts and Science College.

From the above figure, it is found that the tube light is more in number (129 nos.) followed by the LED (95 nos.), CFL (35 nos.), and T8 lamp (35 nos.). A LED light consumes a 20 W whereas a tube light consumes 40 W. Which means that the tube light consumes around twice the power of the LED light.

Hence it is recommended to replace all the available tube lights with the LEDs in a phase schedule or a single replacement.



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ECM 1 – Replace Older Tube lights to Energy efficient LED lights

Present Scenario		Proposed Scenario	
Total Number Tube Lights	129	Total Number of LED	129
Wattage	40W	Wattage	20W
Total hours of operation	10hrs	Total hours of operation	10hrs
Total Units consumed	51.6	Total Units consumed	25.8
Total Unit savings per day		25.8	
Electricity Cost		Rs.9/Unit	
Annual Cost savings		Rs.84753/-	
Initial Investment (Rs.150/LED lamp)		Rs.19350/-	
Payback period		3 months	



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ECM 2- Replace Older fans to BLDC

Present Scenario		Proposed Scenario	
Total Number Fans	168	Total Number of Super Fans	168
Wattage	70W	Wattage	35W
Total hours of operation	10hrs	Total hours of operation	10hrs
Total Units consumed	117.6	Total Units consumed	57.75
Total Unit savings per day		59.85	
Electricity Cost		Rs.9/Unit	
Annual Cost savings		Rs.174762/-	
Initial Investment(Rs.2250/Super Fan)		Rs.378000/-	
Payback period		26 months	




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REPORT OF ENVIRONMENT AUDIT

Submitted to

DON BOSCO COLLEGE OF ARTS AND SCIENCE

KEELA ERAL – 628 908, TAMILNADU, INDIA

Date of Audit: 23.08.2023 (Wednesday)

Submitted by

NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement)

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Motto

'Save the Nature to Save the Future' & 'Go Green to Save the Planet'

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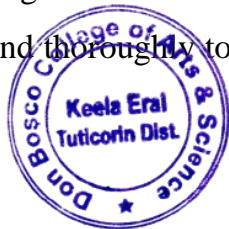

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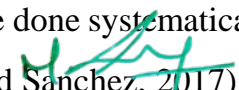
Introduction

Environment (Eco) audit is quantitative and qualitative data to track air, soil and water waste, and to gain actionable insights to improve the operational performance in the atmosphere. This audit is generally used to observe the clean and green environment of an Organization. It provides a 360° view of a surrounding campus and makes it easy for Owners / Managers / Environmentalists to collaborate, measure, control, and reduce environmental impacts. Finally it leads to enhancing the quality of life for human beings, animals and plants. Eco audit initiatives are the need of the hour across the world due to change in environmental conditions, global warming and increasing human population (Maltby, 1995; Haahkim and Yunus, 2017). It aims to make a sustainable and friendly environment for the stakeholders.

Environment audit is a well-developed process of extracting information about an Organization that provides a realistic assessment of how the Organizations take steps towards protecting the environment. In order to save the eco-friendly atmosphere of an Organization, well-developed environmental objectives and targets should be undertaken to reduce the harmful effects to a greater extent. The audit process can minimize the environmental pollution in the campus remarkably which in turn reduces the global warming that affects as a whole. As per the Government law, the environmental legislations should be followed by all the Institutions and Organizations and make sure that their activities should not destroy the environment (Ramachandra and Bachamanda, 2007). An environmental audit is a kind of assessment supposed to create awareness of environmental compliance and implementation gaps in the management system, along with related corrective movements.

This audit is a systematic, documented, periodic and objective review by a regulated entity of facility operations and practices related to meeting the environmental requirements. Environment audit should be undertaken by observing, measuring, recording the data and collecting and analyzing the various components in an Organization related to the environment. To be effective, it must be done systematically and thoroughly together with full management support (Conde and Sanchez, 2017). In




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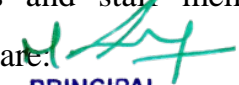
general, environmental audit is designed to achieve a maximum resource optimization and improved process performance in the audit sites. It is a 'Common Sense Approach' to identify the problems and solve those problems pertaining to curb eco-friendly atmosphere (APHA, 1981; Venkataraman, 2009). Environmental audit enables a comprehensive look at the audit sites to facilitate our understanding of material flows and to focus our attention on areas where waste reduction is executed and therefore cost saving is made possible (Gowri and Harikrishnan, 2014).

Environmental audits ensure that the environment is not disturbed from its balanced existence, so that it provides an eco-friendly atmosphere to the stakeholders. Similar to that of Environmental audit, Green campus audit is also a type of assessment to ensure that the Institution and Organization campus should grow a large number of trees, shrubs, herbs, lawns, climbers, twins and lianas in their campus to produce more amount of oxygen and absorb more amount of carbon-di-oxide to provide a healthy atmosphere to the stakeholders (Aparajita, 1995; Adeniji, 2008). Environmental audit provides vivid dimensions on how waste materials are being managed and the source of wastes along with the solutions for environmental degradation is managed. Environmental Management System (ISO EMS 14001:2015) should be implemented by every Organization to ensure that the eco-friendly campus is being given to the stakeholders. Eco-friendly youth leadership programmes, green campus practices, social responsibility and Institutional values comprehending the relationship with the ecosystem for a sustainable environment are being evaluated (IGBC, 2018).

Aims and Objectives of Environment Audit

The important goal of an Environment audit is to promote the environment management and conservation for future generations. The reason for the environmental audit is to perceive, quantify, describe and prioritize the framework of environment sustainability in compliance with the applicable rules, regulations and requirements. In general, Environment audit can be achieved by creating awareness on the importance of safeguarding the environment among students, faculties and staff members, including public domain. The major goals of environment audit are:



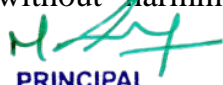

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- To safeguard the environment and reduce the threats posed to human health by the Organization.
- To create awareness among the stakeholders about the importance of environmental degradation and conservation as per the Environment Management Systems (ISO standard of 14001:2015) and Environmental Legislations by the Organization.
- To establish a baseline information about the eco-friendly environment in the campus to the stakeholders for future sustainability.
- To review the disposal of solid wastes and wastewaters in the campus and identify the sources of waste generation and possibilities of mitigation with respect to environmental compliance.
- To conduct outreach programmes to the rural, tribal and urban community people on the environment damage and conservation.
- To correlate the flora and fauna with environmental sustainability in the audit sites to provide a healthy atmosphere to the members of the Organization.
- To take steps to minimize the environmental pollution and degradation by means of developing 'Sanitation and hygiene policy', 'Water conservation policy', 'Waste management policy' and 'Green campus and Environment policy' by the Organization.

Procedures followed in Environment Audit

Environmental audit involves monitoring an organization concerning about the green campus, environment, sanitation and hygiene policies. It is a regular process that is conducted periodically by a regulated entity to check whether an organization meets the requirements of environmental compliance. The process of environmental audit includes examining, collecting, evaluating, documenting data and analyzing various components related to environmental aspects (IGBC, 2018; WGBC, 2018). Environmental audit was carried out as per the procedures mentioned of the Manual of Gnanamangai *et al.* (2018). The environmental audit possesses the following characteristic features in which various aspects of wastes generation and steps taken by the Organization to reduce both solid and liquid wastes without harming the environment.




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- Identification of various sources to generate wastes and types of degradable and non-degradable wastes in the campus.
- Collection of information related to type of operations, use of various rawmaterials and products that generate wastes.
- Finding the highlights of inefficiencies in the process that generate wastes and areas that are to be monitored with extra care.
- Setting up the target for reduction of wastes and source of waste generation without affecting the environmental health.
- Steps taken to minimize the environmental pollution and degradation by means of developing internal policy methods.
- Suggestion of cost effective waste management strategies and zero waste discharge in the Organization.
- Creation of awareness among stakeholders on the benefits of reducing wastes without damaging the ecosystem.
- Aids in increase of process efficiency and status report with regards to environmental compliance and management.

Steps involved in the Process of Environmental Audit

The following are the major steps involved in the process of environmental audit:

Step 1: Opening meeting among the audit team and auditees, discussed about the audit procedure and document verification.

Step 2: Visited the on-site of the audit along with the audit team and auditees.

Step 3: Walked around campus to check the facility as walk-through audit and took photographs for preparing the audit report.

Step 4: Monitor the components as per the environmental audit checklist (Sanitation and hygiene, water conservation, waste management and green campus and environment policies).

Step 5: Noted down what all components are present and what are all not available in the campus as of environmental audit components listed by NSF ISO- EMS checklist.




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Step 6: Identified the issues in the campus with respect to the environmental compliance and strengths and weaknesses of the Auditee's Management controls and risks associated with the audit.

Step 7: Looked into other items to be monitored as per the NSF checklist with respect to Ecology and Environment studies.

Step 8: Exit meeting held after the audit in which the audit findings with the members of the Organization was discussed.

Step 9: Prepared and distributed the findings as a Report and Certificate along with the recommendations including the best practices followed by the Auditee.

Step 10: Comparison between the last audit report with the present audit report in which the number of suggestions and recommendations were taken into consideration and rectified significantly by the Management.

Step 11: Observed the audit process undertaken by the certifying agency between the last audit and current audit processes, whether the same certifying agency has undertaken the audit process or not?.

Benefits of an Environmental Audit:

- Environmental audit provides the following benefits to the Organization:
- Discover various issues related to the environment in the Organization.
- Compute the issues, identify and assess the impact of the issues.
- Provide suggestions to minimize the issues found in the Organization.

On conducting an Environmental audit, it provides the following results:

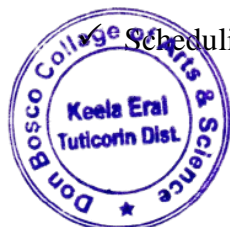
- Conservation of resources and reduction of raw materials.
- Minimizing wastes, control of pollution and reduction of costs.
- Improvement in working conditions and improvement in process efficiency

Phases of an Environmental Audit:

The environmental audit encompasses three phases such as pre-audit, during- audit and post-audit. These phases involve various components to resolve the problems in the campus as well (Arora, 2017; Gnanamangai *et al.*, 2018).

Pre-Audit:

- ✓ Pre-audit involves the following components:
- ✓ Planning the audit
- ✓ Selecting the audit team



Scheduling the audit facility


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- ✓ Acquiring the background information
- ✓ Visiting the site of audit
- ✓ Collection of data and documents verification

During-Audit:

- ✓ During the audit, the following components are involved:
- ✓ Understanding the scope of audit
- ✓ Analysing the strength and weakness of the internal controls audit
- ✓ Conducting the on-site audit
- ✓ Evaluating the observations of audit programme
- ✓ Noting down the key observations and taking photographs
- ✓ Clarifications if required during the audit site and document verification

Post-Audit:

- ✓ Post-audit involves the following components:
- ✓ Identification of the best practices followed by the Organization
- ✓ Compiling a report of the data collected
- ✓ Distributing the report and certificate to the Organization
- ✓ Preparing an action plan to overcome the flaws
- ✓ Providing suggestions to implement the action plan
- ✓ Setting up the future environmental aims and objectives

Components of an Environmental Audit:

Environmental audit has five components, namely:

1. Sanitation and hygiene policy,
2. Water conservation policy,
3. Rainwater harvesting policy,
4. Waste management policy and
5. Waste management initiatives

Sanitation and Hygiene Policy:

In this component, the following are being considered:

- ✓ Physical appearance and overall ambience
- ✓ Adequacy of toilets (Student/Employee: toilet ratio)
- ✓ Gender balance and disabled-friendly toilets (Male: Women)
- ✓ Water taps and sanitation plumbing, adequacy and efficiency
- ✓ Adequate clean drinking water facilities




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- ✓ Kitchen staff apparel and hygiene
- ✓ Canteen and hostel hygiene maintenance
- ✓ Kitchen hygiene and fly proof condition
- ✓ Cutlery, crockery and utensils hygiene
- ✓ Dining hall hygiene and bad of our free
- ✓ Cleaning equipment and consumables

Water Conservation Policy:

In this component, the following are being considered:

- ✓ Know the source of the campus water availability
- ✓ Monitor overhead tanks for periodical cleaning
- ✓ Reuse of treated water, recycling, leakages etc.
- ✓ Drip irrigation / sprinkler irrigation system for watering to plants
- ✓ Water efficient dispensing mechanism in campus

Rainwater Harvesting Policy:

In this component, the following are being considered:

- ✓ Implementation of rainwater harvesting system
- ✓ Functioning status of rainwater harvesting system
- ✓ Connectivity between rainwater harvesting and open wells and bore wells

Waste Management Policy:

In this component, the following are being considered:

- ✓ Is the campus a 'Plastic free zone'?
- ✓ What are the methods adopted for waste segregation and storage?
- ✓ Disposal of solid wastes, reuse and recycling process
- ✓ Vermicompost, cow dung and organic manure units
- ✓ Availability of Biogas plant and its implementation status
- ✓ Installation of incinerators and their functioning status
- ✓ Adequate number of waste bins, separate bins for dry and wet wastes
- ✓ Food waste dumped status methods of disposal.




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Waste Management Initiatives:

In this component, the following are being considered:

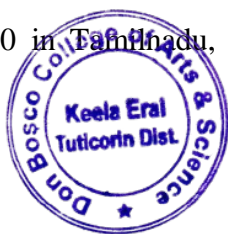
- ✓ Sign boards indicating energy / water conservation in respective places
- ✓ Awareness sign boards on usage of tobacco and tobacco free campus
- ✓ Awareness sign boards on plastic usage and plastic free campus
- ✓ Programmes related to waste segregation / waste disposal systems
- ✓ Sufficient ventilation facility
- ✓ Social responsible activities to rural, tribal and urban areas

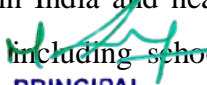
A good environmental audit

- ✓ Defines sources, quantifies types of waste being generated
- ✓ Collates information on unit operations, raw material, products and water usage
- ✓ Highlights process inefficiencies and areas of poor management
- ✓ Helps in setting targets for waste reduction
- ✓ Permits the development of cost effective waste management strategies
- ✓ Raises awareness in the workforce regarding the benefits of waste reduction
- ✓ Helps to improve process efficiency
- ✓ Assess the quantity of water usage within the company.
- ✓ Find out various sources of organic and solid waste generation and mitigation possibilities.
- ✓ Document the waste disposal system properly and bring out a status report on environmental compliance with respect to the waste disposal system.

About the Organization

DON BOSCO COLLEGE OF ARTS AND SCIENCE (DBCAS) The Salesians of Don Bosco (SDB), constitute an international religious order, founded by St. John Bosco (1815 – 1888), commonly known as Don Bosco. A Catholic Priest of the 19th century Italy, Don Bosco is known and celebrated all over the world today, as the Father and Friend of youth, particularly the victims of poverty and neglect, facing various social, economic and moral challenges of a rapidly globalizing world. The SDBs numbering around 14,232 have their presences in 134 countries in all the five continents, engaged in various missions, inspiring, empowering and transforming – in short ‘educating’ the youth to be agents of social change. The Salesians are thus dedicated and committed to youth development for societal transformation and nation building. With over 575 institutions in India and nearly 100 in Tamil Nadu, the Salesians are engaged in a variety of missions including schools,




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Don Bosco College of Arts & Science
KEELA ERAL

colleges, technical institutes, youth centers and social work. The Salesian educational institutions are widely renowned for cultivating moral values, academic excellence, sports, games and culturals towards holistic development of mind and body. The Salesian Province of Trichy, Tamilnadu wanting to raise a monument for the bicentennial celebrations (2015) of the birth of this great saint and educator of youth, initiated its dream in 2013, founding the DON BOSCO COLLEGE OF ARTS AND SCIENCE, KEELA ERAL, in THOOTHUKUDI DISTRICT. It dedicates this higher educational institution to the youth of southern Tamilnadu as a fitting memorial, braving the many challenges and difficulties. As quality in higher education is still remains 10 elusive to the marginalized rural youth, the Don Bosco College of Arts and Science (DBCAS) is a Salesian passion and ambition to bring the youth to the portals of higher education and usher in an egalitarian society. Don Bosco College of Arts and Science, Keela Eral was established in academic year 2013-14 by the Trichy Don Bosco Society. The college is affiliated to Manonmaniam Sundaranar University, Tirunelveli.

Don Bosco College of Arts and Science is maintaining more green cover area and open unutilized landfills zone after building construction as per the guidelines of World Green Building Council, Indian Green Building Council, Environmental Regulations and Compliances.




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Audit Details

Date/Day of Audit	: 23.08.2023 (Wednesday)
Venue of Audit	:DON BOSCO COLLEGE OF ARTS & SCIENCE Keela Eral – 629 908, Tamil Nadu, India.
Audited by	:Nature Science Foundation, Coimbatore, Tamil Nadu, India.
Audit type	: Environment Audit
Name of ISO EMS Auditor	: Mrs. S. Rajalakshmi, Chairman & ISO EMS Auditor, NSF.
Name of Lead Eco Auditor	: Dr. R. Mary Josephine, Board of Directors (South Zone) & Botanist, NSF.
Name of Subject Expert-I	: Dr. D. Vinoth Kumar, Joint Director & Certified Lead Eco Auditor, NSF.
Name of Subject Expert-II	: Er. M. Priya, - Joint secretary
Name of IGBC AP Auditor	: Dr. B. Mythili Gnanamangai, IGBC AP, Indian Green Building Council.
Name of the Energy Auditor	: Er. D. Dinesh kumar & Dr. N. Balasubramanian Certified BEE Energy Auditors
Name of the Eco Auditor-I	: Er. B. Vijayalakshmi Deputy Director & Certified Lead Eco Auditor.
Name of the Eco Auditor-II	: Er. S. Srinivash Tamil Nadu Fire and Rescue Services, Coimbatore
Name of Eco & Green Officer	: Ms. S. Sowndharya Eco & Green Council Programme Officer, NSF



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AWARENESS PROGRAMMES / OUTREACH ACTIVITIES RELATED TO ENVIRONMENT

S.No	Name and Designation of the Resource Persons	Event	Date	No. of Beneficiaries
1	Dr.M.Prabhu NSS Coordinator, Don Bosco College of Arts and Science, Keela Eral	Campus cleaning Programme	13.07.2023	350
2	Thirumaran Founder Children's Trust - Tenkasi	Seed ball Preparation	11.10.2023	400
3	Rev.Dr.S.Victor Antonyraj, Secretary Don Bosco College of Arts and Science, Keela Eral	Mega Tree Plantation	19.10.2023	350
4	Dr.Kowshik Primary Health Center, Keela Eral.	Nilavembu Juice Distribution	06.11.2023	300




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Best Practices on Environment Audit Initiatives followed in the Organization

- A well-established ‘Rainwater harvesting system’ to recharge wells and ground water status by collecting rain waters from the campus.
- NSS Units and Eco Club which are functioning well and conducting a large number of awareness programmes related to nature conservation and environmental protection.
- Swachh Bharat under Clean India Mission is implemented effectively by NSS units
- The Don Bosco College of Arts and Science has created a very good campus ecosystem for making a coexisting and sustainable environment which includes natural and planted vegetation supporting a rich biodiversity of flora and fauna.
- We also teach subject called “Environmental Studies” for our students.

Recommendations for sustainable environment

- Suggested to conduct a large number of awareness programmes on nature conservation and environmental protection.
- Recommended to include various courses related to environmental safety, conservation and environmental pollution in the Curriculum for the students and research scholars.
- Amended to plant more number of oxygen producing and carbon dioxide absorbing plants in the campus to create a very good ecosystem to the stakeholders




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Conclusion

The environmental audit of Don Bosco College of Arts and Science, Keela Eral, underscores the institution's dedication to sustainability and eco-friendly practices. Conducted by the Nature Science Foundation, the audit highlighted commendable initiatives like functional rainwater harvesting system, plastic-free campus policies, green landscaping, and programs under Swachh Bharat to promote cleanliness. Pedestrian-friendly pathways and the use of bicycles further enhance environmental consciousness on campus. The audit identified opportunities for growth, such as expanding awareness programs and incorporating environment-related courses into the curriculum, alongside increasing tree plantations to enrich biodiversity. These efforts, supported by a systematic audit process, reflect the college's commitment to fostering a sustainable ecosystem. By implementing the recommendations, the institution not only sets an example in environmental stewardship but also contributes meaningfully to the global movement for ecological preservation and sustainability.




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Don Bosco College of Arts & Science
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ரஜி.

(Mrs. Rajalakshmi Jayaseelan)
Chairman of NSF
Certified ISO QMS & EMS Auditor

D. Vinoth Kumar

(Dr. D. Vinoth Kumar)
Joint Director of NSF & Botanist
Certified Lead Eco Auditor

B. Mythili

(Dr. B. Mythili Gnanamangai)
Certified Auditor IGBC AP & ASSOCHAM
Indian Green Building Council

Vijayalakshmi

(Er. B. Vijayalakshmi)
Certified Energy & Environment Auditor
Environmental Management System
(ISO 14001:2015)



M. A. J.
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**Don Bosco Arts & Science College
Keela Eral-628908, TamilNadu.**



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NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution Affiliated to Anna University, Chennai)

K.R.Nagar, Kovilpatti - 628 503, Thoothukudi Dist., Tamilnadu.

Dr. K. KALIDASA MURUGAVEL M.E., Ph.D.,

Principal

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Email : principal@nec.edu.in,

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Web: www.nec.edu.in

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the Department of Mechanical Engineering of our institution, below mentioned faculty members of our institution, conducted Green audit at Don Bosco College of Arts & Science, KeelaEral, Thoothukudi during the month of April 2023 and the recommendations are given in the report. I thank the management of Don Bosco College of Arts & Science, KeelaEral for providing the opportunity and I also appreciate the efforts made by the audit team.


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Energy Auditor, EA -34488/22

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GIST

Water Management

- There are around 6 bore well is in the campus, average depth of bore well is 220 feet, and average water is at 120 feet from ground surface. Overall capacity of overhead tank is 4000L, and average pumping is 16 kL per day.
- Water taps are regularly maintained, there is no major water leaks in the campus.
- Waste water from the hostels are utilized for gardening.
- 6 months average consumption of water including hostel is 186 kL per day.
- Roof water collection system has been installed to harvest the rain water.

Green Management

- 404.68 m² of garden is in the campus.
- 312 no's of Neem trees and some species of herbal plants are there.
- Garden consumes 8 KL of treated water per day.
- A dedicated Gardener is available to take care of the garden.
- A student centric ECO club is functioning in the campus.

Carbon Foot Print

- College is working with around 470 students and 43 teaching and non-teaching staff members in a day.
- Only about 16 students and staff members are using two wheelers. They also travelling 10 km distance in a day as an average.
- As a green initiative it is advised to use cycles inside the campus. Students are motivated to use bicycles for their daily travelling.
- All the remaining Students are using either college bus or public transport system, which is mass transit system, with less carbon foot print
- One generator (20kVA) are there for power backup.

Waste Management

- 470 students, 34 teachers and 9 non-teaching staff are contributing to waste management.
- There is no major wastage quantum in solid, liquid waste
- As an initiative on 'Plastic Pollution Free Tamil Nadu', the club joined hand with NSS and conducted various campaigns.
- Waste Wealth program "Art from waste" is being conducted to students every year.




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Green Audit Report of Don Bosco Arts and science college

WATER MANAGEMENT

What are the sources of water in your college?

- Bore well

How many wells are there in your college?

- Bore well – 6+1 Nos. (1-Rain water harvesting)

Number of motors used for pumping water from each well?

One motor per well. (Except Rain water harvesting borewell)

What is the total horse power of each motor?

- 1 HP – 1 Nos
- 2 HP – 3 Nos
- 3 HP – 2 Nos

What is the depth of each well?

- Bore well – 180 ft. – 1 Nos, 200 ft – 1 Nos, 300 ft – 4 Nos

What is the present depth of water in each well?

30-40 ft. from ground surface

How does your college store water?

Sintex tank

Quantity of water stored in your overhead water tank? (in litres)

Overall 14000 Litres (approx.) including all buildings

Quantity of water pumped every day? (in litres)

16000 Litres (approx.)

If there is water wastage, specify why?

No

Locate the point of entry of water and point of exit of waste water

BoysHostel-1; Excluding Department

What are the uses of waste water in your college?

For gardening

Drinking water quality standards:

The treated water from our RO water treatment plant is having the following parameters which satisfy the limits given by IS 10500:2012.



Green Audit Report of Don Bosco Arts and science college

Sl. No.	Parameters	Parameters in purified water	Permissible limits	
			Acceptable	Max. Allowable
1	Appearance before filtration	Clear	-	-
2	Appearance after filtration	Clear	-	-
3	Specific Conductance at 25°C (µmhos/cm)	106	-	-
4	Carbonate hardness as CaCO ₃ (mg/L)	7.3	-	-
5	Phenolphthalein alkalinity as CaCO ₃ to pH 8.3 (mg/L)	BDL (DL: 0.5)	-	-
6	Total Silica as SiO ₂ (mg/L)	1.85	-	-
7	pH at 25°C	7.5	6.5-8.5	No relaxation
8	Colour (hazen)	2	5	15
9	Odour	Agreeable	Agreeable	Agreeable
10	Turbidity (NTU)	<0.2	1	5
11	Total dissolved solids (mg/L)	30.0	500	2000
12	Total hardness as CaCO ₃ (mg/L)	7.3	200	600
13	Methyl orange alkalinity as CaCO ₃ (mg/L)	49.9	200	600
14	Chloride as Cl (mg/L)	4.8	250	1000
15	Sulphate as SO ₄ (mg/L)	BDL (DL:1)	200	400
16	Calcium as Ca (mg/L)	<2.0	75	200
17	Magnesium as Mg (mg/L)	1.1	30	100

Number of water taps. Amount of water used per day?

- 60 Nos
- 16,000 Litres

No. of restrooms. Amount of water used per day?

- No. of restroom for staff = 15
- Amount of water used per day = 1000 litres
- No. of restroom for boys and girls = 36



Green Audit Report of Don Bosco Arts and science college

- Amount of water used per day= 10000 litres

No. of water taps in the canteen. Amount of water used per day?

- No. of water taps in canteen= 17 Nos.
- Amount of water used per day= 3000 litres

Amount of water used per day for garden use.

7000 liters (Recycled water)

Total use of water in each hostel?

Boys Hostel- 4000 litres

Is there any water used for agricultural purposes?

No

Does your college harvest rain water?

Yes

If yes, how many rain water harvesting units are there?

1 Nos. (Roof water collection system)

Are there signs reminding people to turn off the water? Yes/No

Yes

How often is the garden watered?

Daily

Amount of water for other uses? (Items not mentioned above)

No

Area of the college land with tree/building canopy.

25 Acres

Is there any water management plan in the college?

Yes

Are there any water saving techniques followed in your college?

Rain Water harvesting




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GREEN MANAGEMENT

Is there a garden in your college? Area?

Yes, Gardens spreading over an area of 404.68 Squaremetre

Do students spend time in the garden?

Yes

List the trees in the garden, with approx. numbers of species.

SL No	Common name	Total in Nos
1	Neem	312
2	Teak	138
3	Drumstick tree	8
4	Naval	10
5	Gulmohar	24
6	Pungai	17
7	Batham	10
8	Mango	1
9	Sapota	2
10	Royal Palm	10
11	Coconut	9
12	Poovarasu	10
13	Gooseberry	2
14	Pomegranate	1
15	Papaya	3
16	Cassia	1
17	Christmas tree	1
18	Agathi keerai	10
19	Maha kani	5

List the plants for your campus.

SL No	Common name	Total in Nos
1	Pseuderanthemum Maculatum	114
2	Adenium Obesum	5
3	Dracaena Fragrans	3
4	Adonida	14
5	Tecoma Stans	5



Green Audit Report of Don Bosco Arts and science college

6	Graptophyllum Pictum	221
7	Jasmine	20
8	Hibiscus	10
9	Oleander	29
10	West Indian Jasmine	4
11	Euphorbia Trucalli	124
12	Kapebonavista Plumbago	13
13	Hinoki Cypress	2
14	Chrysanthemum	10

List the species planted by the students, with numbers.

- *Azadirachta indica* - 10 Nos.

Whether you have displayed scientific names of the trees in the campus?

Yes

Is there any plantations in your campus? If yes specify area and type of plantation.

Yes. Neem tree plantation – 14,163.99 m².

Is there any vegetable garden in your college? If yes how much area?

202.34 m²

Is there any medicinal garden in your college? If yes how much area?

Under process

What are the vegetables cultivated in your vegetable garden?

Corn, Chilly, Cluster beans

How much water is used in the vegetable garden and other gardens?

Gardening– 8,000 liters/day

Who is in-charge of gardens in your college?

Gardner– 1 Nos.

Are you using any type of recycled water in your garden?

Yes

List the name and quantity of pesticides and fertilizers used in your garden

Urea, Potassium, biofertilizers

Whether you are doing organic farming in your college? How?

Yes

Do you have any composting pit in your college? If yes what are you doing with the



Green Audit Report of Don Bosco Arts and science college

compost generated?

Yes. Generate manure for the plant.

What do you doing with the vegetables harvested? Do you have any student market?

Using it for the hostel mess.

Is there any botanical garden in your campus? If yes give the details of campus flora.

NO

Give the number and names of the medicinal plants in your college campus.

Azadirachta indica – 312

Is there a nature club in your college? If yes what are their activities?

- Brief about clubs related to nature (ECO Club like that)

Is there any irrigation system in your college?

No

What are the nature awareness programmes conducted in the campus?

- Programmes related to Green Campus day and Plastic Free campus

What is the total area of the campus under treecover?

Green Covered area = 32,374.85 m²





Green Audit Report of Don Bosco Arts and science college



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CARBON FOOT PRINT

What is the total strength of students and teachers in your College?

	No. of Students	No. of Teachers	No. of Non-teaching staff
Gents	230	19	8
Ladies	240	15	1

Total Number of vehicles used by the stake holders per day of the college.

Motorbike	16
Car	2

No. of cycles used:

1

No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day): 16

Average distance travelled	Quantity of fuel (Litre)	Amount Rs.
10	$0.25 \times 16 = 4$ Lit/day	412/-

No. of cars used (average distance travelled and quantity of fuel and amount used per day): 2

Average distance travelled	Quantity of fuel (Litre)	Amount Rs
35	$2 \times 2 = 4$ Lit/day	412/-

Number of parent-teacher meetings in a year? Parents turned up (approx.):

Two, 500 Nos.

Number of visitors with vehicles per day?

3 Nos.

Number of generators used per day (hours). Give the amount of fuel used per day.

20 kVA, whenever the need arises.

1.5 litres/day

Number of LPG cylinders used in the canteen (Give the amount of fuel used per day and amount spent).

No




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WASTE MANAGEMENT

What is the total strength of student, teachers and Non-teaching staff in your college?

	No. of students	No. of Teachers	No. Non-teaching staff
Gents	230	19	8
Ladies	240	15	1
Total	470	34	9

Which of the following are available in your college? Give area occupied and number

Garden area	: 202.34 m ²	Garbage dump (number)	: 3 nos.
		Laboratory	: 0
Kitchen	: 1 no's	Canteen	: 1 nos.
Toilets	: 51 no's	Car/scooter shed area	: 2 nos.

Does your college generate any waste? If so, what are they? How much quantity? Number or weight

YES

E-waste	: 1 kg/month.
Hazardous waste (toxic)	: Nil
Solid waste	: 7 kg/day
Dry leaves	: 50kg/day
Canteen waste	: 3 kg/day
Glass	: Nil
Unused equipment	: Nil
Medical waste if any	: Nil
Napkins	: Nil
Others(specify)	

Is there any waste treatment system in the college?

No

Is there any treatment for toilet/urinal/sanitary napkin waste?

What is the approximate quantity of waste generated per day? (in kilograms)

Approx	Biodegradable	Non-Biodegradable	Hazardous	Other
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Green Audit Report of Don Bosco Arts and science college

<1 kg	0.3 kg/ day	Nil	Nil	Nil
-10kg	Nil	Nil	Nil	Nil
>10kg	Nil	Nil	Nil	Nil

Details of Dust bins for collection of Solid waste

SL No	Location	Capacity – 10 Ltr	Capacity – 30 Ltr	Capacity – 50 Ltr
1	A Block		1 nos	4 nos
2	B Block			3 nos
3	C Block		3 nos	
4	Canteen			2 nos
5	Hostel		2 nos	1 nos

Is there any waste wealth program practiced in the college?

YES. "Art from waste" is being conducted to students every year.

How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.

No




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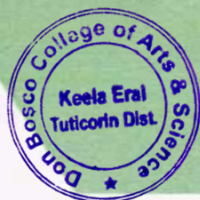


**Don Bosco Arts & Science College
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TO WHOM SO EVER IT MAY CONCERN

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GIST

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Green Audit Report of Don Bosco Arts and science college

WATER MANAGEMENT

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How many wells are there in your college?

- Bore well – 6+1 Nos. (1-Rain water harvesting)

Number of motors used for pumping water from each well?

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What is the total horse power of each motor?

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- 2 HP – 3 Nos
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- Bore well – 180 ft. – 1 Nos, 200 ft – 1 Nos, 300 ft – 4 Nos

What is the present depth of water in each well?

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How does your college store water?

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Quantity of water stored in your overhead water tank? (in litres)

Overall 14000 Litres (approx.) including all buildings

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Number of water taps. Amount of water used per day?

- 60 Nos
- 16,000 Litres

No. of restrooms. Amount of water used per day?

- No. of restroom for staff = 15
- Amount of water used per day = 1000 litres
- No. of restroom for boys and girls = 36



Green Audit Report of Don Bosco Arts and science college

- Amount of water used per day= 10000 litres

No. of water taps in the canteen. Amount of water used per day?

- No. of water taps in canteen= 17 Nos.
- Amount of water used per day= 3000 litres

Amount of water used per day for garden use.

7000 liters (Recycled water)

Total use of water in each hostel?

Boys Hostel- 4000 litres

Is there any water used for agricultural purposes?

No

Does your college harvest rain water?

Yes

If yes, how many rain water harvesting units are there?

1 Nos. (Roof water collection system)

Are there signs reminding people to turn off the water? Yes/No

Yes

How often is the garden watered?

Daily

Amount of water for other uses? (Items not mentioned above)

No

Area of the college land with tree/building canopy.

25 Acres

Is there any water management plan in the college?

Yes

Are there any water saving techniques followed in your college?

Rain Water harvesting




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GREEN MANAGEMENT

Is there a garden in your college? Area?

Yes, Gardens spreading over an area of 404.68 Squaremetre

Do students spend time in the garden?

Yes

List the trees in the garden, with approx. numbers of species.

SL No	Common name	Total in Nos
1	Neem	312
2	Teak	138
3	Drumstick tree	8
4	Naval	10
5	Gulmohar	24
6	Pungai	17
7	Batham	10
8	Mango	1
9	Sapota	2
10	Royal Palm	10
11	Coconut	9
12	Poovarasu	10
13	Gooseberry	2
14	Pomegranate	1
15	Papaya	3
16	Cassia	1
17	Christmas tree	1
18	Agathi keerai	10
19	Maha kani	5

List the plants for your campus.

SL No	Common name	Total in Nos
1	Pseuderanthemum Maculatum	114
2	Adenium Obesum	5
3	Dracaena Fragrans	3
4	Adonida	14
5	Tecoma Stans	5



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6	Graptophyllum Pictum	221
7	Jasmine	20
8	Hibiscus	10
9	Oleander	29
10	West Indian Jasmine	4
11	Euphorbia Trucalli	124
12	Kapebonavista Plumbago	13
13	Hinoki Cypress	2
14	Chrysanthemum	10

List the species planted by the students, with numbers.

- *Azadirachta indica* - 10 Nos.

Whether you have displayed scientific names of the trees in the campus?

Yes

Is there any plantations in your campus? If yes specify area and type of plantation.

Yes. Neem tree plantation – 14,163.99 m².

Is there any vegetable garden in your college? If yes how much area?

202.34 m²

Is there any medicinal garden in your college? If yes how much area?

Under process

What are the vegetables cultivated in your vegetable garden?

Corn, Chilly, Cluster beans

How much water is used in the vegetable garden and other gardens?

Gardening– 8,000 liters/day

Who is in-charge of gardens in your college?

Gardner– 1 Nos.

Are you using any type of recycled water in your garden?

Yes

List the name and quantity of pesticides and fertilizers used in your garden

Urea, Potassium, biofertilizers

Whether you are doing organic farming in your college? How?

Yes

Do you have any composting pit in your college? If yes what are you doing with the



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compost generated?

Yes. Generate manure for the plant.

What do you doing with the vegetables harvested? Do you have any student market?

Using it for the hostel mess.

Is there any botanical garden in your campus? If yes give the details of campus flora.

NO

Give the number and names of the medicinal plants in your college campus.

Azadirachta indica – 312

Is there a nature club in your college? If yes what are their activities?

- Brief about clubs related to nature (ECO Club like that)

Is there any irrigation system in your college?

No

What are the nature awareness programmes conducted in the campus?

- Programmes related to Green Campus day and Plastic Free campus

What is the total area of the campus under treecover?

Green Covered area = 32,374.85 m²





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CARBON FOOT PRINT

What is the total strength of students and teachers in your College?

	No. of Students	No. of Teachers	No. of Non-teaching staff
Gents	230	19	8
Ladies	240	15	1

Total Number of vehicles used by the stake holders per day of the college.

Motorbike	16
Car	2

No. of cycles used:

1

No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day): 16

Average distance travelled	Quantity of fuel (Litre)	Amount Rs.
10	$0.25 \times 16 = 4$ Lit/day	412/-

No. of cars used (average distance travelled and quantity of fuel and amount used per day): 2

Average distance travelled	Quantity of fuel (Litre)	Amount Rs
35	$2 \times 2 = 4$ Lit/day	412/-

Number of parent-teacher meetings in a year? Parents turned up (approx.):

Two, 500 Nos.

Number of visitors with vehicles per day?

3 Nos.

Number of generators used per day (hours). Give the amount of fuel used per day.

20 kVA, whenever the need arises.

1.5 litres/day

Number of LPG cylinders used in the canteen (Give the amount of fuel used per day and amount spent).

No




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WASTE MANAGEMENT

What is the total strength of student, teachers and Non-teaching staff in your college?

	No. of students	No. of Teachers	No. Non-teaching staff
Gents	230	19	8
Ladies	240	15	1
Total	470	34	9

Which of the following are available in your college? Give area occupied and number

Garden area	: 202.34 m ²	Garbage dump (number)	: 3 nos.
		Laboratory	: 0
Kitchen	: 1 no's	Canteen	: 1 nos.
Toilets	: 51 no's	Car/scooter shed area	: 2 nos.

Does your college generate any waste? If so, what are they? How much quantity? Number or weight

YES

E-waste : 1 kg/month.

Hazardous waste (toxic) : Nil

Solid waste : 7 kg/day

Dry leaves : 50kg/day

Canteen waste : 3 kg/day

Glass : Nil

Unused equipment : Nil

Medical waste if any : Nil

Napkins : Nil

Others(specify)

Is there any waste treatment system in the college?

No

Is there any treatment for toilet/urinal/sanitary napkin waste?

What is the approximate quantity of waste generated per day? (in kilograms)

Approx	Biodegradable	Non-Biodegradable	Hazardous	Other
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<1 kg	0.3 kg/ day	Nil	Nil	Nil
-10kg	Nil	Nil	Nil	Nil
>10kg	Nil	Nil	Nil	Nil

Details of Dust bins for collection of Solid waste

SL No	Location	Capacity – 10 Ltr	Capacity – 30 Ltr	Capacity – 50 Ltr
1	A Block		1 nos	4 nos
2	B Block			3 nos
3	C Block		3 nos	
4	Canteen			2 nos
5	Hostel		2 nos	1 nos

Is there any waste wealth program practiced in the college?

YES. "Art from waste" is being conducted to students every year.

How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.

No




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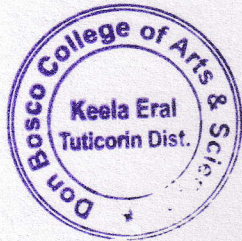


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Declaration

I hereby declare that the details and information given above are complete and true to the best of my knowledge and conviction.



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