



Thakur Educational Trust's (Regd.)

**THAKUR RAMNARAYAN
COLLEGE OF ARTS & COMMERCE**

ISO 9001:2015 Certified

Thakur Ramnarayan Educational Campus
S. V. Road, Dahisar (East), Mumbai - 400 068

Mob.: +91 902 902 6799 • Fax : 022 - 2828 1300

E-mail : admin@trcac.org.in • Website : www.trcac.org.in



GREEN AUDIT ENVIRONMENTAL & ENERGY 2023

**Thakur Ramnarayan Educational Campus, S.V. Road, Dahisar (East),
Mumbai - 400068**

email: admin@trcac.org.in

<https://www.trcac.org.in/>

Phone: 022 28281200

Conducted and submitted by



**UNIQUE ASSESSMENT SYSTEM
(Registration No: 2310200317579390)
(MSME No: MH33D0096740)**

Acknowledgment and Summary of Green Audit (EMS & EnMS) Thakur Ramnarayan College of Arts & Commerce

Unique Assessment Systems extends heartfelt gratitude to the management of **Thakur Ramnarayan College of Arts & Commerce** for entrusting us with the task of conducting a **Green (Environment & Energy Audit.)** This initiative reflects the institution's commitment to environmental responsibility and sustainability.

Understanding Green and Environment Audit

A Green Audit, often referred to as an Environmental Audit, is a structured and systematic evaluation of an organization's practices and their environmental impacts. The primary objective is to assess and improve the **Environment Management Systems (EMS)** of the organization, focusing on compliance with established standards and sustainable practices.

Objectives of the Audit

The Green Audit aims to:

- Investigate and identify environmental issues.
- Evaluate environmental compliance and responsibilities.
- Ensure the institution meets stated environmental objectives.
- Recommend practices that enhance resource efficiency and sustainability.

Key aspects evaluated include:

1. **Energy Practices** – Efficient energy use and renewable energy adoption.
2. **Waste Management** – Implementation of the 3R's: Reduce, Reuse, and Recycle.
3. **Pollution Control** – Mitigating adverse impacts on the environment.
4. **Resource Conservation** – Sustainable utilization of water and other resources.

Scope of the Audit

For Thakur Ramnarayan College of Arts & Commerce, the audit encompassed:

1. **Biodiversity Assessment**
2. **Health and Safety Management**
3. **Water Management and Conservation**
4. **Sanitation Management**
5. **Renewable Energy Usage**
6. **Adopted Green Practices**
7. **Various Audits** – Specific environmental components.
8. **Recommendations** – For future improvements.

Acknowledgment of College Team Contribution

The success of this audit was made possible through the collaborative efforts of the college team. We extend our sincere appreciation to the management, faculty, and support staff of **Thakur Ramnarayan College of Arts & Commerce** for their cooperation, timely provision of data, analysis reports, and assistance during our on-site visit.

Looking Ahead

The Environmental Audit Report will provide actionable insights and recommendations aimed at enhancing the institution's environmental performance, promoting sustainability, and ensuring the effective management of resources.

Unique Assessment Systems is proud to have partnered with Thakur Ramnarayan College of Arts & Commerce in this essential endeavour and looks forward to seeing the institution set benchmarks in environmental stewardship

Sr.No	Name	Designation
1	Dr. Ravish R Singh	Principal
2	Mr. Vaqar Bubere	IQAC In charge
3	Mr. Ajay Gupta	Asst. Professor
4	Mrs. Reenu Yadav	Asst. Professor
5	Mr. Tushar Shinde	Jr. Clerk
6	Mr. Shashank Tripathi	Maintenance Manager

We also extend our gratitude to the other staff members who actively contributed to the monitoring and assessment of the Green Audit data.

The Audit was conducted on

Auditors/ Members of Audit Team

Sr.No	Name	Qualification
1	Mr. Sunil Nair	M.Sc. Physics, ISO 9001/14001/45001/50001 Lead Auditor
2	Mr. Chetan Nemade	BEE Certified Energy Manager, Advance Diploma In Industrial Safety (ADIS)

LIST OF INSTRUMENTS USED

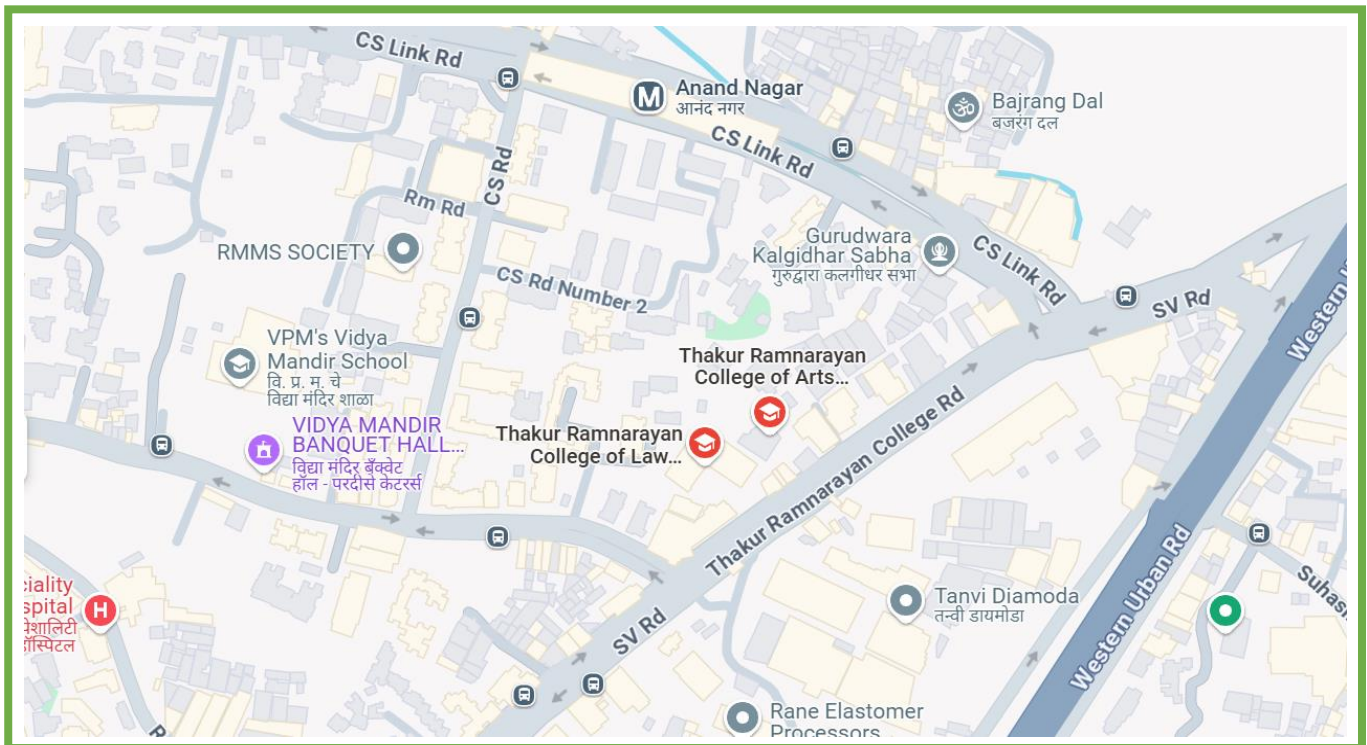
1. Lux meter (Meco)
2. TDS meter
3. CO₂ meter
4. Portable Indoor Air quality meter
5. Sound dB meter

<u>CONTENT</u>
About the College
Vision
Mission
Objectives
Location
Infrastructure of College
Introduction
Observation
Green Belt Management
Introduction
Observation
Water Quality and Management System
TDS Level of Water
Introduction
Observation
Rainwater Harvesting-College Premises
Observation
Water Tap Reducer
Observation
Recommendation
Air Quality
Introduction
Observation
Sound Comfort/Quality
Introduction
Observation
Day Light Illumination/Comfort
Introduction
Observation
No Vehicle Day Initiative
Observation
Other Energy Efficient, Green, Waste Reduction Practices by the College Management
Energy management and Observation
Declaration

ABOUT COLLEGE



1	College Building	1.3 Acre
2	College Campus	3230 sq.ft.



INTRODUCTION

ABOUT THE TRUST

A young sapling planted initially has blossomed in to a tree spreading its branches and stems of education the example is Thakur Educational Trust

Thakur Educational Trust was formed by the Thakur family as a sense of responsibility of repaying the social debt. The trust was registered as a Public Trust in the year 1990 with an objective to lend a helping hand towards the welfare of the society and reform the educational system.

In the year 1990, the trust kept its first step in the field of education and now it has become a conglomerate of premiere educational Institutions driven by Thakur family. The trust is a combination of premier educational Institutes, University accredited professional courses and autonomous courses. All the Institutions under this Thakur Educational Trust are ISO certified, which is an acknowledgement of the Institution capability to deliver and cater the need of the education with professionalism worldwide.

The Thakur Educational Trust has catered various needs of the society including education from KG. to PG at all levels irrespective of sex, creed and religion.

About Thakur Ramnarayan College of Arts and Commerce (TRCAC)

The **Thakur Ramnarayan College of Arts and Commerce** is an intellectual community that nurtures student's learning, fosters faculty research, and provides service to the larger community. The college is a comprehensive system where individuals are able to interact with their peers in a deep, meaningful way both inside and outside of the classrooms.

At TRCAC we shall stress on collaborative learning, individual intellectual development, and respect for diverse points of view, because we believe that these activities enable graduates to be effective in a rapidly changing, world. An undergraduate major in the Arts, Science, Commerce and Self Finance programmes shall develop for each student critical thinking, clarity of expression and breadth of Knowledge that provides them with professional success, and productive participation in society.

Students shall engage with many learning communities while in the TRCAC : when they join with their entering class in courses that shall build their skills and their sense of opportunity; they shall develop close ties through their major or majors: and they shall connect to local and national communities through internships, service learning and community service. Broad curricular choices shall encourage students to explore personal interests, meet diverse groups across campus, or prepare for specific graduate and professional programs. At TRCAC, activities within and beyond the classroom shall promote the lifelong learning shall surely make our graduates successful in a wide variety of careers.

VISION

To be a leading institution of higher education contributing to societal development through holistic approach towards learning.

MISSION

To nurture and sustain academic excellence by imparting quality education to develop a community of intellectuals with professional skills and ethical values.

COLLEGE GOALS

- Academic Excellence
- Realization of inherent creative skills
- Sharpening of leadership skills
- Inculcating the right values
- Sensitization about problems in the country
- Emphasis on liberal, secular and open-minded education
- Promoting a culture of research and exploration at all levels
- Providing platforms to enhance employability skills through work and earn.
- Creating instruments of team building.
- Catering to diverse strata of society.

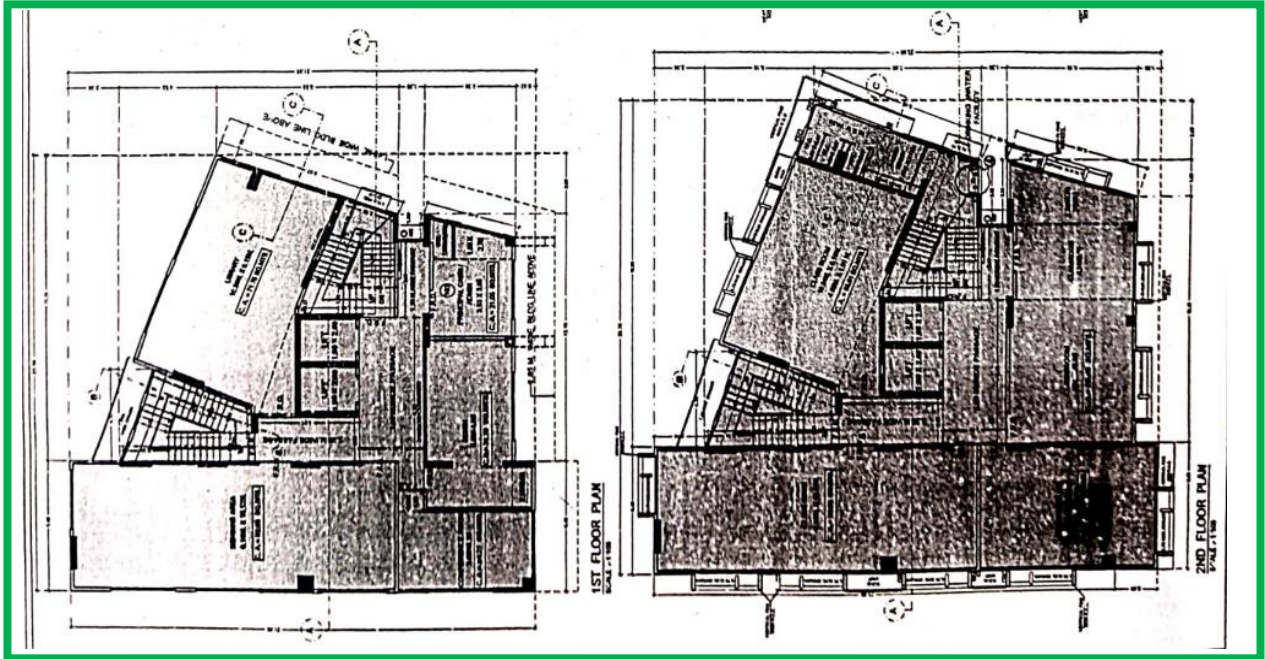
INFRASTRUCTURE

The institution offers comprehensive facilities to support effective teaching and learning, including well-equipped Ac classrooms, state-of-the-art laboratories, and advanced computing equipment.

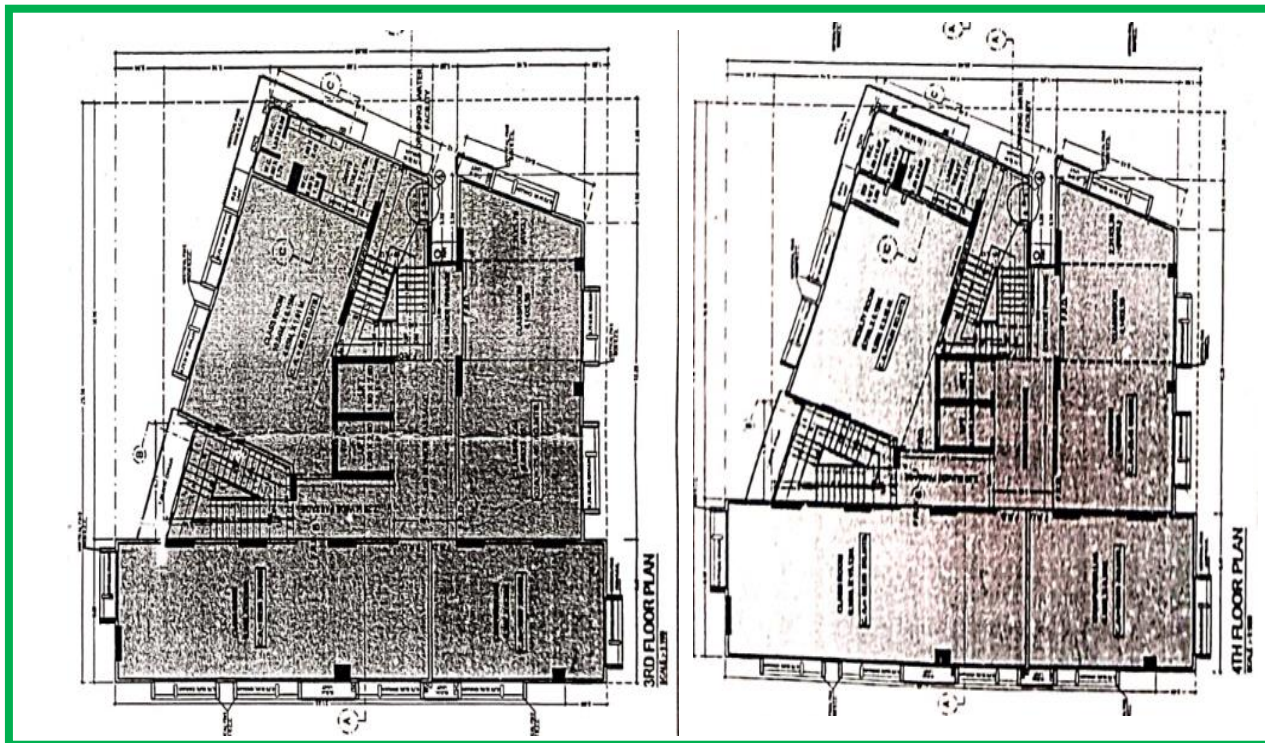
The campus consists of a multi-story main building with ground plus Nine floors. The premises, including classrooms and administrative offices, are under constant CCTV surveillance to ensure safety and security. Alternate floor is equipped with water coolers featuring RO-UV filtration systems to provide clean drinking water.

The building is fully equipped with a modern firefighting system to enhance safety. The college campus also includes essential amenities such as a library, Seminar Hall, Conference room, Psychology Room, Carbon Shoonya Lab, canteen, and ample parking space

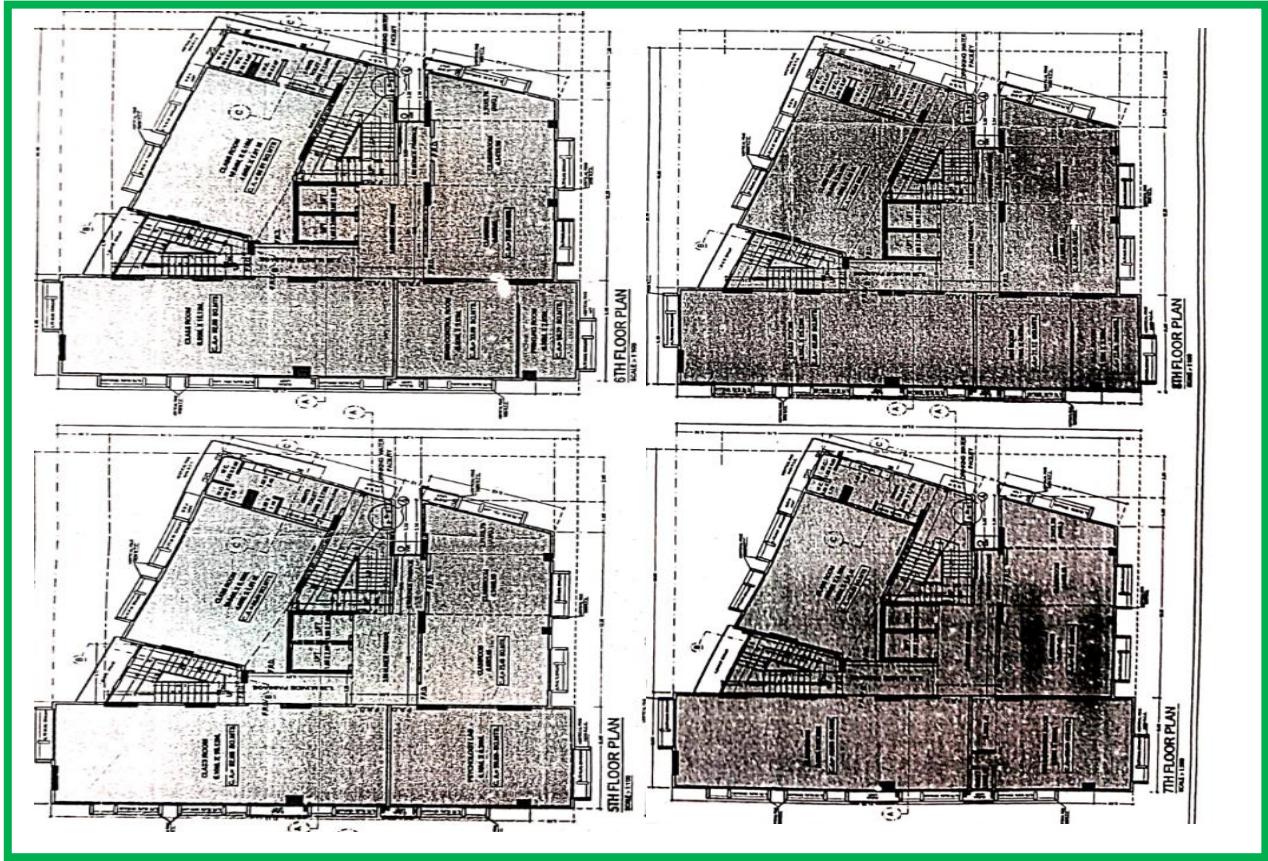
BUILDING DIAGRAM FLOOR WISE



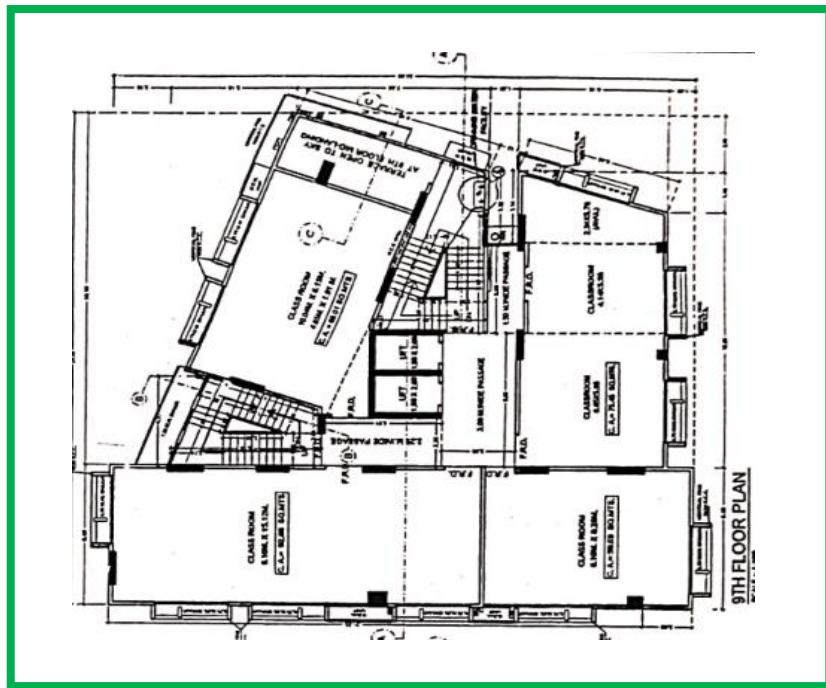
1st & 2nd Floor



3rd & 4th Floor



5th, 6th, 7th & 8th Floor



9th Floor

Floor	Rooms	Floor	Rooms
Gr.Floor	1 Washroom	Fifth Floor	3 Classroom
			1 IT Lab
Firt Floor	Principal Cabin		1 Washroom
	Admin Office		
	Conference Room	Sixth Floor	1 Exam Room
	Seminar Hall		3 Classroom
	Libarary		1 Washroom
	1 Washroom		
Second Floor	3 Classroom	Seventh Floor	1 Psychology Lab
	1 IT Lab		3 Classroom
	1 Washroom		1 Washroom
Third Floor	3 Classroom	Eight Floor	3 Classroom
	1 IT Lab		NSS Room & IQAC Room
	1 Washroom		1Washroom
Fourth Floor	1 Staffroom	Ninth floor	4 Classroom
	2 Classroom		1 Washroom
	1 IT lab		
	1 Washroom		

ASSESSMENT OF COLLEGE CAMPUS BUILDING INFRASTRUCTURE

Sr.No	Location	Space
1	Main Building	Spacious
2	Parking Area	Spacious
3	Passage, Staircase & Lobby	Spacious
4	Principal Office & Admin Office	Spacious
5	Conference room	Spacious
6	Classroom	Spacious
7	All Labs	Spacious
8	Toilet Blocks	Spacious
9	Canteen	Spacious

Sr.No	Location	Space	Ventilation	Natural Light	Cleanliness
1	Main Building	Spacious	Very Good	Excellent	Excellent
2	Parking Area	Spacious	Very Good	Very Good	Good
3	Passage, Staircase & Lobby	Spacious	Very Good	Very Good	Very Good
4	Principal Office & Admin Office	Spacious	Very Good	Very Good	Excellent
5	Conference room	Spacious	Very Good	Good	Good
6	Classroom	Spacious	Very Good	Very Good	Good
7	All Labs	Spacious	Very Good	Good	Good
8	Toilet Blocks	Spacious	Good	Good	Good
9	Canteen	Spacious	Very Good	Good	Good

COURSE OFFERED BY COLLEGE

Under Graduate Courses

B.A – Bachelor of Arts

B.A.M.M.C – Bachelor of Arts (Multimedia & Mass Communication)

B. Com – Bachelor of Commerce

B.Com. (A & F) – Bachelor of Commerce (Accounting & Finance)

B.M.S – Bachelor of Management Studies

B.Sc. (I.T) – Bachelor of Science (Information & Technology)

B.Sc. (C.S.) – Bachelor of Science (Computer Science)

Certificate Course

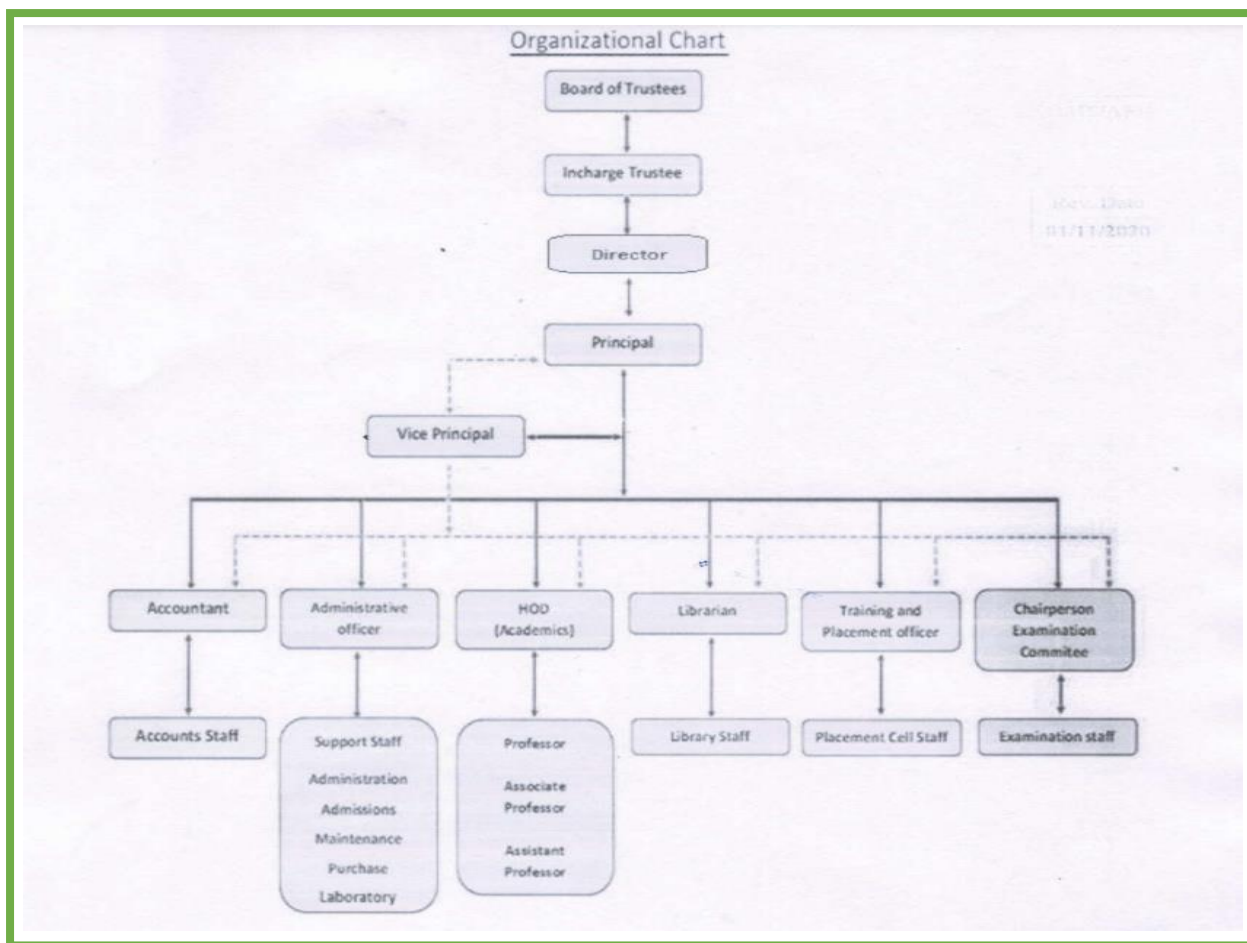
- Psychology of Bilingualism and Multilingualism
- Basics of Psychology
- Fundamental of Research Methodology
- Introduction to Indian Classical Music
- Fundamentals of Cognitive Psychology
- Sports Marketing and Journalism
- Storytelling in Branding and Content Marketing
- Strategic Approach to Service Marketing
- Financial Statement Analysis and Reporting
- Introduction to Data mining
- Introduction to Database Management System.

LIST OF FACULTY MEMBERS

Sr. No.	Name of the Faculty	Designation
1	Dr. Ravish R Singh	Principal
2	Sumathi Rajkumar	Vice-Principal
3	Sumeet Rathod	Asst. Professor
4	Ranjani Shukla	Asst. Professor
5	Prachi Singh	Asst. Professor
6	Shaikh Raashid Hasan	Asst. Professor
7	Vaqar Bubere	Asst. Professor
8	Daksha Chaudhary	Asst. Professor
9	Sonali Devadiga	Asst. Professor
10	Aniushika Joshi	Asst. Professor
11	Ashita Karkera	Asst. Professor
12	Khushali Sanghvi	Asst. Professor
13	Prashant Kamble	Asst. Professor
14	Mahima Yogeeswarar	Asst. Professor
15	Ankita Tiwari	Asst. Professor
16	Komal Jambhale	Asst. Professor
17	Riddhi Pandya	Asst. Professor
18	Jainish Gotecha	Asst. Professor
19	Smriti Dubey	Asst. Professor
20	Pooja Gandhi	Asst. Professor
21	Sonam Singh	Asst. Professor
22	Ashlesha Gurav	Asst. Professor
23	Reenu Yadav	Asst. Professor
24	Priyadarshani Singh	Asst. Professor
25	Darshan Kantelia	Asst. Professor
26	Rashmitha Shettigar	Asst. Professor
27	Arjun Sah	Asst. Professor
28	Suman Gupta	Asst. Professor
29	Criset Burboze	Asst. Professor
30	Ayesha Shaikh	Asst. Professor
31	Pooja Choudhary	Asst. Professor
32	Prajakta Kadam	Asst. Professor
33	Omkar Sambare	Asst. Professor
34	Virupana Gouda	Asst. Professor

35	Dheeraj Dubey	Asst. Professor
36	Sharddha Singh	Asst. Professor
37	Krunali Mehta	Asst. Professor
38	Ronak Maru	Asst. Professor
39	Neha Sawant	Asst. Professor
40	Vishal Sharma	Asst. Professor
41	Sarita Chaurasiya	Asst. Professor
42	Nisha Kekan	Asst. Professor
43	Ruhi Main	Asst. Professor
44	Vedanti Kulkarni	Asst. Professor
45	Sangita Yadav	Asst. Professor
46	Ajaykumar Gupta	Asst. Professor
47	Nikita Singh	Asst. Professor
48	Sanjana Pandey	Asst. Professor
49	Rishabh Mishra	Asst. Professor
50	Ruchi Mali	Asst. Professor
51	Deveeka Shetty	Asst. Professor
52	Prachi Patade	Asst. Professor

NON - TEACHING STAFF		
SR NO	NAME	DESIGNATION
1	RUPESH DAUR	JR. CLERK
2	SHASHANK TRIPATHI	JR. CLERK
3	SUMAN YADAV	ACCOUNT ASST
4	TEJASVINI KARANDE	JR. CLERK
5	TUSHAR SHINDE	JR. CLERK
6	SELVINA PEGADO	JR. CLERK
7	MANOJ AMBULKAR	PEON
8	VINIT GAUD	PEON
9	RAHUL MAHAKAL	PEON
10	SUJAY KALEKAR	PEON
11	AVINASH KUMAR SAROJ	PEON
12	RAMCHANDRA TAMBE	PEON
13	TUSHAR PATIL	PEON
14	SHRIKANT DHOPAT	PEON
15	SURAJ YADAV	SWEEPER
16	RAM WASKAR	JR. CLERK
17	SATIRAJ YADAV	LAB ASST.
18	SATISH RAJBHAR	SWEEPER
19	TUSHAR MAIN	PEON
20	BALDEV BABU BHAJ MALPARA	SWEEPER
21	YADNESH THUL	PEON



GREEN BELT MANAGEMENT

Green auditing is an essential step to identify and determine whether the institutions practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources.

But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas.

It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly? Green audit standardizes all such practices and provides an efficient way to use natural resources.

In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert it in to green and sustainable. Green audit provides an approach for it. It also increases overall awareness among the folks working in institution towards the eco-friendly environment.

This is the second attempt to conduct green audit of this College campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon foot print of the campus.

Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staffs in the College.

The Green Belt Area is meant for conservation of nature and enhance the aesthetic value within the college premises.

Green belt includes trees, herbs/ shrubs and potted plants, herbal green organic farm, polyhouses, and vertical garden. Plantation helps to create a buffer area and thus helps in reducing noise level and maintaining temperature of the area



OBSERVATION

Green Belt:

Currently, 30% of the campus is covered by greenery.

There is potential to increase the green cover by planting more trees, shrubs, and potted plants.

Nursery Initiative:

The college has started developing its own nursery, cultivating fruits and vegetables within the campus.

Composting:

The campus has a compost pit to manage garden waste like leaves, branches, and twigs through bio-composting.

This compost is intended for use in gardening and plantations.

However, the compost pit was observed to be non-operational during the audit.

Suggestions for Improvement:

Start using the compost pit again.

Plant more greenery with help from students and staff.

Use the nursery to support planting activities.

Create awareness about composting and green initiatives.

SHARING FEW MORE PLANT DETAILS FOR REFERENCE WHICH CAN BE PLANTED

Sr No	Name of the Plant	Family
1	<i>Acacia auriculiformis</i>	Mimosaceae
2	<i>Alstonia scholaris (Saptparni)</i>	Apocynaceae
3	<i>Aralia sp</i>	Araliaceae
4	<i>Acalipha hispida</i>	Euphorbiaceae
5	<i>Averrhoa bilimbi (Kamrakh, star fruit)</i>	Oxalidaceae
6	<i>Asparagus aethiopicus (Shatavari)</i>	Asparagaceae
7	<i>Bixa orellana (Lipstick tree, Annatto)</i>	Lamiaceae
8	<i>Bauhinia tomentosa</i>	Caesalpinaceae
9	<i>Azadirachta indica (Neem)</i>	Meliaceae
10	<i>Bambusa sp.(yellow bamboo)</i>	Poaceae
11	<i>Canna indica</i>	Scitamineae
12	<i>Caesalpinia pulcherrima (Peacock flower)</i>	Fabaceae
13	<i>Cordyline fruticosa (Ti plant)</i>	Asparagaceae
14	<i>Cinnamomum tamala (Tejpata)</i>	Lauraceae

15	<i>Caryota urens (Fishtail palm)</i>	Arecaceae
16	<i>Cocus nucifera (Nariyal)</i>	Arecaceae
17	<i>Codiaeum variegatum (Croton)</i>	Euphorbiaceae
18	<i>Dianthus plumarius</i>	Caryophyllaceae
19	<i>Dendrocalamus strictus</i>	Poaceae
20	<i>Draceana marginata</i>	Asperagaceae
21	<i>Duranta plumieri</i>	Verbenaceae
22	<i>Artocarpus heterophyllus (Fanas)</i>	Moraceae
23	<i>Epipremnum aureuns</i>	Araceae
24	<i>Eucalyptus globulus (Nilgiri)</i>	Myrtaceae
25	<i>Eugenia jambolana (Jamun)</i>	Myrtaceae
26	<i>Ficus bengalensis (Banyan)</i>	Moraceae
27	<i>Ficus racemosa (Cluster fig)</i>	Moraceae
28	<i>Ficus religiosa (Sacred fig, Pipal)</i>	Moraceae
29	<i>Ficus elastica (Rubber tree)</i>	Moraceae
30	<i>Hemelia patens</i>	Rubiaceae
31	<i>Hibiscus rosa-senensis (Jasvand)</i>	Malvaceae
32	<i>Lagestroemia sp.</i>	Lythraceae
33	<i>Ixora coccinea</i>	Rubiaceae
34	<i>Magnifera indica (mango)</i>	Anacardiaceae
35	<i>Cycas (sago palm)</i>	Cycadaceae
36	<i>Piper longum (kalimiri)</i>	Piperaceae
37	<i>Panocratium sp. (lilly)</i>	Amaryllidaceae
38	<i>Pandanus dubius</i>	Pandanaceae
39	<i>Peltophorum pterocarpum</i>	Caesalpiniaceae
40	<i>Phyllanthus emblica (avla)</i>	Euphorbiaceae
41	<i>Pithecellobium dulce (vilayati chinch)</i>	Fabaceae

Is there a garden on your college campus?

Yes, Green Zone is practiced and implemented.

Have College displayed scientific names of the trees on campus?

No.

Is there any vegetable garden in college campus? If yes, how much area is covered?

Yes, Portable Container is used with in the college campus.

Is there any medicinal garden on your college campus? If yes, how much area is covered?

Yes, but need to plant more medicinal saplings

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

The college does not use any kind of pesticides in the college garden.

Are College using organic farming in your college campus?

No. However college has plans to introduce it in the near future.

Do you have any composting kits on your college campus? If yes, what are you doing with the compost generated?

Yes, Composite Kit is available but not in use.

Any threatened plant species planted/conserved?

No.

Is there any nature club in your college campus?

Yes.

Are there any fruit yielding plants in your college campus? If yes, Details of the trees planted.

No

Are there any groves in your college campus?

No.

Is there any irrigation system in your college campus?

No.

What is the nature awareness program conducted on campus?

Nature Awareness Programs are conducted in the college by different departments, NSS and Committees.

What is the involvement of students in the green cover maintenance?

College has regular activities where students take part in plantation.

Share your ideas for further improvement of green cover.

Thakur Ramnarayan College of Arts and Commerce actively conducts nature awareness programs to promote environmental understanding and empathy among students. These efforts aim to:

Create Awareness:

Sensitize students and teachers about the importance of environmental conservation.

Encourage appreciation for nature and biodiversity.

Encourage Participation:

Provide students with at least one opportunity during their academic tenure to contribute to plant diversity preservation.

Motivate them to take positive environmental actions.

Lectures: Environmental awareness lectures are organized to educate and inspire.

Plantation Drives: The NSS department leads regular tree-planting drives on campus.

These initiatives aim to cultivate lifelong responsibility toward environmental conservation among students and faculty.

Improving green cover on a college campus can enhance the environment, promote sustainability, and create a pleasant atmosphere. Here are some more practical ways to achieve this:

Plant More Trees and Shrubs

Organize tree plantation drives involving students, faculty, and staff.
Focus on native and drought-resistant species for better growth and minimal maintenance.

Develop a Green Belt

Allocate specific areas for a dedicated green belt around the campus perimeter or along pathways.
Include a mix of trees, shrubs, and ground-cover plants.

Promote Vertical and Terrace Gardening

Use building walls for vertical gardens.
Utilize rooftops for terrace gardens to maximize green space.

Create a Campus Nursery

Cultivate saplings of trees, shrubs, and flowering plants in a nursery.
Use these plants for expanding the green cover on campus.

Engage in Regular Maintenance

Ensure proper watering, pruning, and pest control for existing plants.
Use mulching to retain soil moisture and improve plant health.

Enhance Landscaping

Add lawns, flower beds, and ornamental plants to beautify the campus.
Install pathways and benches in green areas for recreational use.

Recycle Garden Waste

Use a compost pit to recycle fallen leaves and plant waste.
Use the compost as natural fertilizer for plants.

Involve the Community

Form an eco-club for students to manage and maintain green initiatives.
Conduct workshops and awareness programs about the importance of greenery.

Incorporate Biodiversity

Plant flowering and fruit-bearing trees to attract birds and pollinators.
Set up a butterfly garden or medicinal plant garden.

Monitor and Improve

Conduct periodic audits of green spaces.

Use feedback to continuously enhance the green cover.

Implementing these steps will not only improve the green cover but also contribute to the college's environmental sustainability goals.

WATER QUALITY AND MANAGEMENT SYSTEMS

INTRODUCTION

Water is a vital resource for life on Earth, and safe drinking water is essential for human health and well-being. It accounts for a significant part of our daily intake and plays a crucial role in maintaining bodily functions, such as regulating temperature, aiding digestion, and flushing out toxins.

Importance of Drinking Water

Essential for Survival: Humans can survive weeks without food but only a few days without water.

Health Benefits:

Maintains hydration.

Supports vital organs like the kidneys, liver, and brain.

Aids in digestion and nutrient absorption.

Quality and Safety: Clean, contaminant-free water prevents diseases and promotes overall health.

TDS Components:

Essential minerals: Calcium, magnesium, and potassium, which are beneficial for health.

Harmful impurities: Arsenic, lead, and other heavy metals, as well as carbonates, fluorides, and sulfides, which can be harmful when present in excess.

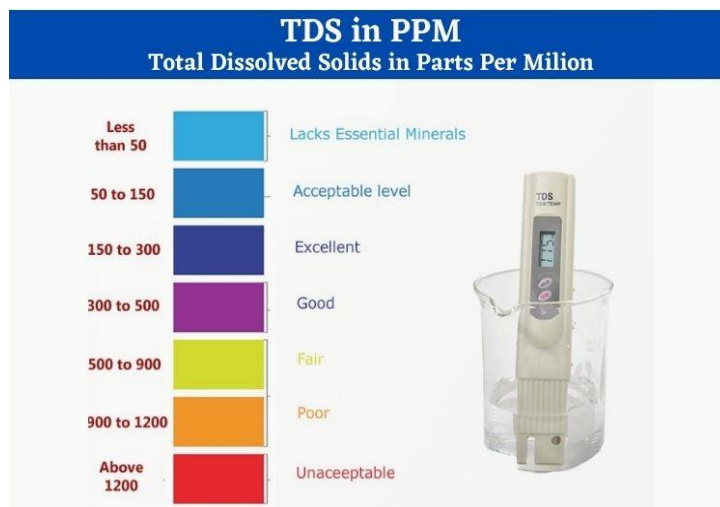
Acceptable TDS Levels:

The Bureau of Indian Standards (BIS) recommends a TDS level of up to 500 ppm (parts per million) for drinking water.

Impacts of TDS:

Low TDS (below 50 ppm): Water might lack essential minerals.

High TDS (above 500 ppm): Can indicate excessive impurities or harmful contaminants.



Here is a representation of the BIS (Bureau of Indian Standards) guideline table for TDS levels in drinking water:

TDS Level (ppm)	Water Quality	Comments
< 50 ppm	Poor	Lacks essential minerals; may taste flat.
50-150 ppm	Excellent	Suitable for drinking; balanced in minerals.
150-250 ppm	Good	Slightly mineral-rich; still considered safe and palatable.
250-500 ppm	Acceptable	Safe for consumption per BIS standards.
500-900 ppm	Marginal	May be acceptable in some regions, but borderline safe.
900-1200 ppm	Poor	Generally not recommended; may taste salty.
> 1200 ppm	Unacceptable	Unsafe for consumption; high risk of harmful impurities.

OBSERVATION



READING: - TDS – 39 PPM

Characteristics of Water Below 50 ppm TDS

Mineral Deficiency:

Lacks essential minerals like calcium, magnesium, and potassium, which are vital for health. Prolonged consumption may contribute to mineral deficiencies in the body.

Taste:

Often described as flat or bland because it lacks the minerals that enhance taste.

Suitability:

Commonly used in applications requiring pure water, such as:
 Industrial processes.
 Laboratory experiments.
 Specific medical uses like dialysis.

Not ideal for regular drinking purposes without remineralization.

Improving Low TDS Water

If the TDS is below 50 ppm, you can:

Use a Water Mineralizer:

Adds essential minerals like calcium and magnesium to the water.

Blend with Mineral-Rich Water:

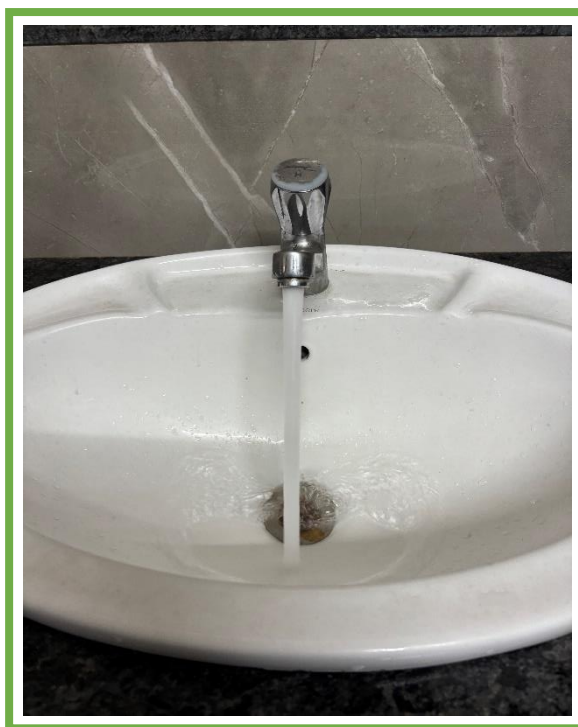
Mix low TDS water with water that has a higher mineral content.

Check Source Water Quality:

Ensure the water source is not over-treated or lacking natural mineral content.

Water below 50 ppm is generally safe to drink but may not be ideal for long-term consumption. For optimal health, it's important to balance purity and mineral content in drinking water.

WATER SAVING MANAGEMENT



Existing taps in college consume more water than necessary during tasks like washing utensils or hands, it's crucial to retrofit or replace them with more efficient options.

Efficient Tap Water Reducers

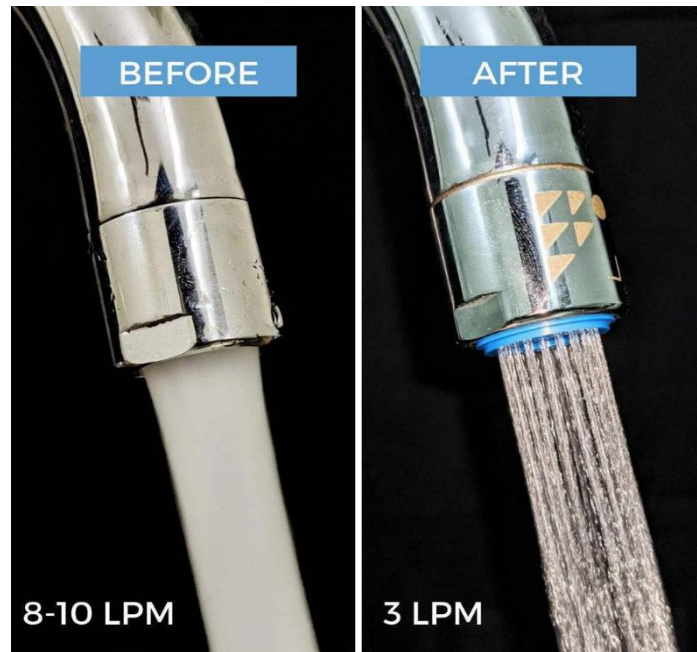
Install Aerators:

Attach aerators to taps, which mix air with water, reducing flow without compromising washing efficiency.

Can save up to 50%-70% of water.

Low-Flow Taps:

Replace standard taps with low-flow taps that limit water output. Using efficient water flow reducers is an excellent step toward water conservation, especially in areas with high usage like college cafeterias, restrooms, and dormitories



(LPM – Liters Per Minute)

Potential Benefits

Water Conservation: Up to 70% reduction in water usage.

Cost Efficiency: Lower water bills due to reduced consumption.

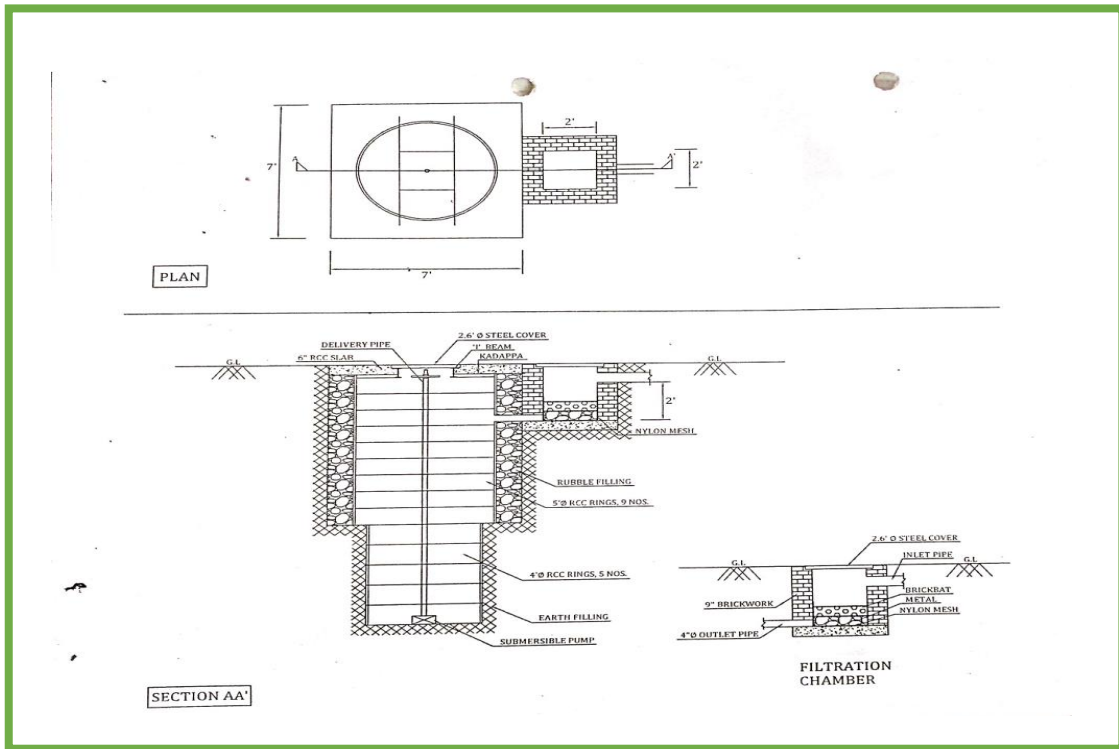
Sustainability Goals: Contributes to the college's environmental and sustainability initiatives.

RAIN WATER HARVESTING- COLLEGE PREMISES

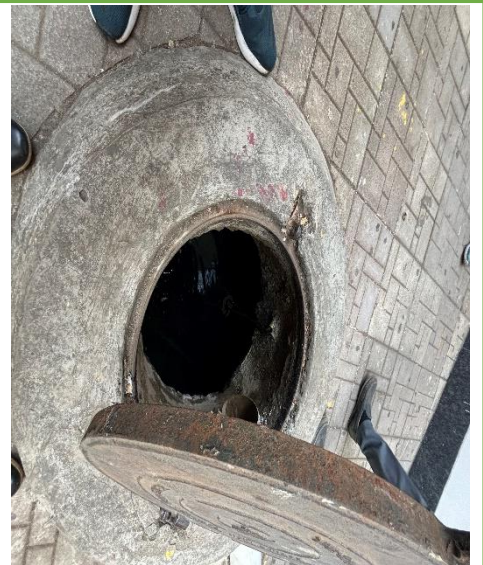
The implementation of rainwater harvesting in college is an excellent step towards sustainability and efficient water usage. By utilizing the large rooftop space to collect rainwater, you're not only reducing the demand on local water sources but also helping recharge the bore well, which can be crucial for maintaining groundwater levels.

The use of collected water for washrooms and other domestic purposes also helps save potable water, contributing to the overall conservation effort. Annual recharging of the bore well ensures that the system remains effective and sustainable in the long run.

DIAGRAM



RAINWATER HARVESTING PIPING SYSTEM IMAGE



AIR QUALITY

INTRODUCTION

Indoor air quality (IAQ) refers to the condition of air inside buildings, especially in terms of the health and comfort of the occupants. In a college campus, IAQ is critical because students and faculty spend long hours indoors, making the quality of the air they breathe directly impact their health, productivity, and overall well-being. IAQ can be affected by various factors, including the presence of pollutants, ventilation systems, temperature, and humidity levels.

Indoor air is considered healthy when it is free from harmful contamination and is deemed acceptable when most people are comfortable with it. Since humans breathe in approximately 12,000 liters of air every day, the quality of indoor air plays a critical role in our overall health. Poor indoor air quality can lead to various health issues, including respiratory and cardiovascular diseases, allergies, irritation of the respiratory tract, and in some cases, even cancer.

Common indoor air pollutants found in college campuses include:

1. **Volatile Organic Compounds (VOCs):** These are emitted from paints, cleaning products, and furniture.
2. **Particulate Matter:** Dust, pollen, and other tiny particles can be inhaled, causing respiratory issues.
3. **Carbon Dioxide (CO₂):** High CO₂ levels, often due to overcrowding or poor ventilation, can lead to drowsiness and difficulty concentrating.
4. **Mold and Mildew:** Damp areas can lead to the growth of mold, which negatively impacts air quality.
5. **Tobacco Smoke:** Smoking indoors can severely reduce air quality.

Pollutant	Normal Range	Alert Level	Hazardous Level
CO ₂ (Carbon Dioxide)	400-1,000 ppm	>1,000 ppm	>5,000 ppm (headaches, dizziness)
HCHO (Formaldehyde)	0-0.1 ppm	>0.1 ppm	>0.5 ppm (respiratory issues)
TVOC (Total VOCs)	0-0.5 mg/m ³	>0.5 mg/m ³	>1.0 mg/m ³ (headaches, dizziness)
PM 2.5	0-10 µg/m ³	>10 µg/m ³	>50 µg/m ³ (respiratory diseases)
PM 10	0-20 µg/m ³	>20 µg/m ³	>100 µg/m ³ (long-term health issues)

READINGS



LOCATION	CO2	HCHO	TVOC	PM 2.5	PM 10	Level(CO2, HCHO, TVOC)	PARTICULATE MATTER
	ppm	µg/m3	µg/m3	µg/m3	µg/m3	OBSERVATION	OBSERVATION
CLASS ROOM	468	0.002	0.012	41	47	Acceptable	Acceptable
ADMIN OFFICE	932	0.003	0.163	55	63	Alert Range	Alert Range
PRINCIPAL ROOM	481	0.003	0.018	58	51	Acceptable	Acceptable
IQAC ROOM	466	0.003	0.018	58	67	Acceptable	Acceptable
STAFF ROOM	495	0.004	0.024	60	69	Acceptable	Acceptable
LIBRARY	1037	0.038	0.183	50	58	Acceptable	Acceptable
IT LAB	468	0.002	0.013	44	51	Acceptable	Acceptable

OBSERVATION

Overall readings show CO₂ level is well maintained in most of the place in college campus, HCHO & TVOC is bit high in most of area which needs to be recertified

Air conditioners are installed in Classrooms, offices, staff rooms, conference room, exam room and computer laboratories. ACs are serviced regularly to ensure proper indoor air quality.

In college air quality is good/aspirational as per threshold values of CO₂, but Particulate Matter (PM 2.5), Particulate Matter (PM 10), Formaldehyde (HCHO) and Total Volatile Organic Compounds (TVOC) are on Alert side for indoor air quality parameters.

Controlling CO₂, HCHO & TVOC

Controlling **CO₂**, **HCHO (formaldehyde)**, and **TVOCs (total volatile organic compounds)** on a college campus requires a mix of proactive building management, infrastructure improvements, and community engagement. Here's a detailed approach:

Strategies to Control CO₂ Levels

Action	Description
Enhance Ventilation	Install or upgrade HVAC systems with energy recovery ventilators (ERVs) to improve air exchange.
Natural Ventilation	Open windows and doors in classrooms and offices during breaks to allow fresh air circulation.
Install CO ₂ Monitors	Place monitors in classrooms, labs, and auditoriums to track levels and adjust ventilation.
Increase Green Spaces	Plant trees and maintain indoor plants to absorb CO ₂ and enhance air quality.
Optimize Occupancy	Avoid overcrowding in classrooms and auditoriums to reduce CO ₂ buildup from exhalation.

Strategies to Control Formaldehyde (HCHO)

Action	Description
Avoid Formaldehyde-Releasing Products	Use low-formaldehyde or formaldehyde-free materials in furniture, plywood, and insulation.
Improve Indoor Ventilation	Ensure proper airflow to dilute indoor HCHO concentrations.
Use Air Purifiers with Activated Carbon Filters	Deploy air purifiers specifically designed to remove chemical pollutants like formaldehyde.
Seal Exposed Wood Products	Apply sealants to prevent formaldehyde emissions from composite wood products.
Regulate Indoor Temperature and Humidity	Maintain 30-60% humidity and moderate temperatures to minimize formaldehyde off-gassing.

Strategies to Control TVOCs

Action	Description
Use Low-VOC Products	Opt for low-VOC paints, cleaning products, adhesives, and finishes across the campus.
Ensure Proper Storage of Chemicals	Store volatile chemicals like solvents and cleaning agents in sealed containers and ventilated areas.
Implement Green Cleaning Practices	Use eco-friendly and non-toxic cleaning products.
Increase Ventilation in Labs and Workshops	Install fume hoods and ensure proper exhaust systems to control emissions in labs and workshops.
Regular Maintenance of HVAC Systems	Clean and replace filters regularly to ensure efficient removal of TVOCs.

Campus-Wide Initiatives

Action	Description
Conduct Indoor Air Quality Audits	Regularly monitor CO ₂ , HCHO, and TVOC levels across the campus using air quality sensors.
Educate the Campus Community	Raise awareness about the sources of pollutants and how students and staff can help reduce them.
Introduce Indoor Plants	Use air-purifying plants such as peace lilies, snake plants, or bamboo palms in indoor spaces.
Adopt Sustainable Construction	Ensure new buildings meet green building standards to minimize pollutant emissions.

By implementing these measures, a college campus can maintain healthier air quality, reduce pollutant exposure, and provide a better environment for students and staff

Reducing **PM 2.5** and **PM 10** (fine and coarse particulate matter) indoors and outdoors involves implementing strategies to minimize their sources and improve air filtration. Here are practical steps:

Indoor Reduction Strategies

Action	Description
Use Air Purifiers	Install HEPA (High-Efficiency Particulate Air) filters to capture fine particles.
Improve Ventilation	Use mechanical ventilation systems with air filtration to bring in clean outdoor air.
Avoid Burning Indoors	Stop burning candles, incense, or smoking inside, as these release particulates.
Cook with Proper Ventilation	Use exhaust fans and ensure chimneys are functional when cooking to expel smoke and oil vapor.
Keep Surfaces Clean	Regularly vacuum with HEPA-filter vacuums and mop floors to remove settled particles.
Control Dust	Use doormats and remove shoes to prevent dust from entering the house.
Seal Leaks	Seal cracks and gaps in doors and windows to prevent outdoor particulates from entering.

Outdoor Reduction Strategies

Action	Description
Reduce Vehicle Emissions	Use public transport, carpool, or electric vehicles to lower exhaust particulates.
Avoid Open Burning	Ban or limit practices like burning waste, leaves, or agricultural residues.
Plant Vegetation	Grow trees and plants to act as natural air filters by trapping airborne particles.
Control Construction Dust	Cover construction sites, use water sprinkling, and enforce dust control measures.
Regulate Industrial Emissions	Implement strict emissions controls for factories and power plants.

Energy and Waste Management

Action	Description
Shift to Renewable Energy	Install solar panels to reduce emissions from diesel generators or other non-renewable sources.
Improve Waste Management	Ensure proper segregation and recycling of waste to avoid dust and pollution from landfill sites.

By combining these measures, the campus environment can be made healthier and more conducive to learning while reducing particulate pollution

SOUND COMFORT/QUALITY

Introduction to Sound Comfort Quality

Sound comfort quality refers to the measure of acoustic conditions that promote a pleasant and functional auditory environment for individuals in various settings. It involves managing sound levels, frequencies, and reverberations to reduce noise disturbances, enhance communication, and foster well-being.

Achieving sound comfort quality is essential in diverse spaces, such as workplaces, homes, schools, and public venues. Poor acoustic environments can lead to distractions, stress, and even health issues, while a well-designed acoustic environment can improve productivity, focus, and relaxation.

Key aspects of sound comfort quality include:

Noise Control: Reducing unwanted noise from external sources (traffic, machinery) or internal activities.

Speech Intelligibility: Ensuring that speech is clear and comprehensible, especially in spaces like classrooms and conference rooms.

Reverberation Management: Controlling the persistence of sound to avoid echoes or excessive reflections that disrupt clarity.

Material Selection: Using materials that absorb, reflect, or diffuse sound appropriately to enhance acoustic balance.

Design Optimization: Considering architectural and spatial designs to create an acoustically comfortable environment.

A focus on sound comfort quality ensures that spaces are conducive to their intended purposes, balancing functionality and auditory well-being.

Noise and Its Impact on the Environment

Noise is an unwanted or disruptive sound that interferes with normal activities, irritates humans, and adversely affects their well-being. **Ambient noise** refers to the composite sounds of an environment, originating from multiple sources, both nearby and distant. When noise levels exceed tolerable limits, causing irritation and harm, it is termed **noise pollution**.

Characteristics of Noise Pollution:

Unavoidable in Modern Civilization: Noise is an inevitable by-product of technological advancement and urbanization. The hum of machinery, roar of traffic, clamor of crowds, and industrial activities contribute significantly to its prevalence.

Invisible Yet Harmful: Despite its intangible nature, noise pollution has tangible physiological and psychological effects, such as stress, hearing loss, and sleep disturbances.

Ubiquitous Presence: Whether from trains, airplanes, or public utilities, noise invades living and working environments, creating a pervasive disturbance.

Legal Framework for Noise Control

The **Environment (Protection) Act, 1986**, under **Section 6**, specifies the maximum permissible noise levels for different areas. These limits are established to safeguard public health and maintain environmental balance, emphasizing the importance of mitigating noise pollution.

Why Noise Pollution is a Concern:

Physiological Impacts: Prolonged exposure to high noise levels can lead to hearing impairment, increased blood pressure, and other health issues.

Psychological Effects: Noise disrupts mental peace, leading to stress, irritability, and reduced productivity.

Environmental Nuisance: Excessive noise not only affects humans but also disturbs wildlife, altering natural behaviour patterns.

Addressing noise pollution requires a combined effort of regulatory measures, technological solutions, and public awareness to create quieter and healthier environments.

Sound levels are measured in **decibels (dB)**, a logarithmic scale representing sound intensity. Different areas have specific permissible decibel limits to ensure a balance between functionality and comfort, as per regulations like those in the **Environment (Protection) Act, 1986**, and guidelines from the **World Health Organization (WHO)**.

Permissible Sound Levels in Various Areas:

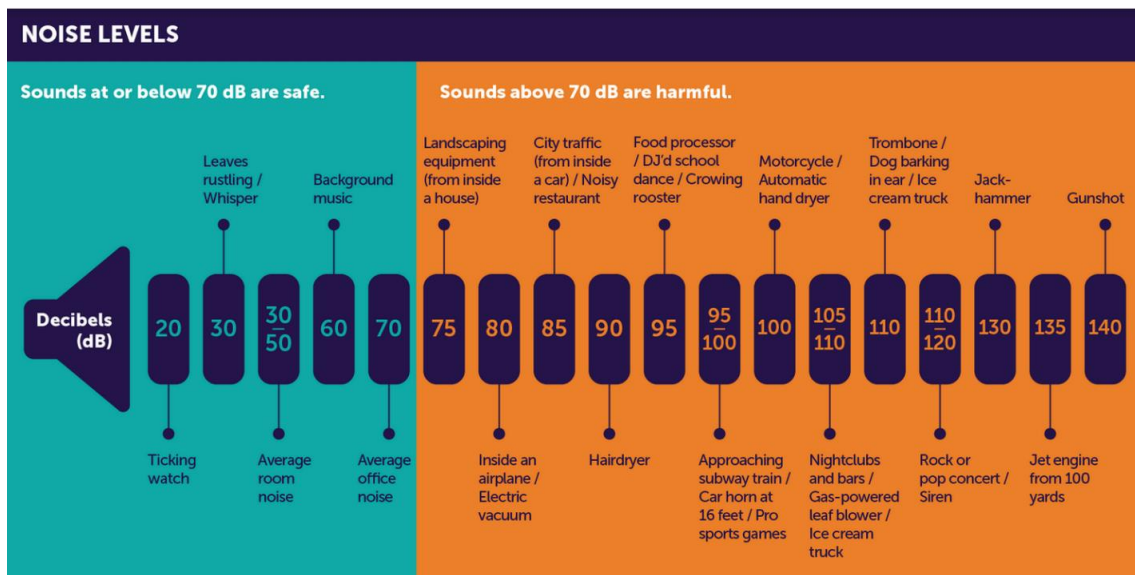
Area/Zone	Daytime Limit (dB)	Night time Limit (dB)
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Silence Zone (e.g., hospitals, schools, College)	50 - 70	40 -55

READING



Threshold Sound DB level at Different Locations in College

LOCATION	LIMITS (DB)	OBSERVATION
CLASS ROOM	69.2	Within Permissible Limits
ADMIN ROOM	75.0	Within Permissible Limits
PRINCIPAL ROOM	60.1	Within Permissible Limits
IQAC ROOM	56.1	Within Permissible Limits
LIBRARY	126	Not Within Permissible Limits
STAFF ROOM	115	Not Within Permissible Limits
IT LAB	68.1	Within Permissible Limits



DAY LIGHT ILLUMINATION/COMFORT

INTRODUCTION

Daylight illumination refers to the use of natural sunlight to provide lighting within buildings, reducing reliance on artificial lighting. It plays a critical role in creating comfortable, energy-efficient, and sustainable indoor environments. Proper utilization of daylight enhances visual comfort, supports human well-being, and contributes to environmental sustainability by minimizing energy consumption.

The concept of daylight illumination integrates architectural design, material selection, and advanced technologies to maximize natural light penetration while avoiding glare, overheating, or discomfort. Factors such as window placement, orientation, shading devices, and the reflectance of interior surfaces significantly influence the effectiveness of daylighting strategies.

Importance of Daylight for Comfort:

1. **Visual Comfort:** Natural light offers better color rendering and contrast, making it ideal for workspaces, homes, and public areas.
2. **Psychological Benefits:** Exposure to daylight has been linked to improved mood, productivity, and overall mental well-being.
3. **Health Advantages:** Daylight supports the regulation of circadian rhythms, which are vital for sleep patterns and overall health.
4. **Energy Savings:** Efficient use of daylight reduces dependency on artificial lighting and lowers energy costs.

Light is a powerful environmental factor that influences various physiological and psychological functions in the human body. Its effects extend beyond vision, impacting systems such as the nervous system, circadian rhythms, pituitary gland, endocrine system,

and pineal gland. The wavelengths of light play a crucial role in these processes, triggering biological responses that affect our health and well-being.

Serotonin Production:

Light exposure, particularly during the daytime, stimulates the production of serotonin, often referred to as the "happiness hormone." Serotonin improves mood, increases alertness, and enhances overall mental well-being. Insufficient light, especially during darker months, can lead to reduced serotonin levels, contributing to seasonal affective disorder (SAD) and other mood disorders.

Melatonin Regulation:

Light also regulates the production of melatonin, a hormone critical for sleep and wake cycles. Exposure to bright light suppresses melatonin secretion, promoting wakefulness during the day. Conversely, dim light or darkness signals the body to increase melatonin production, facilitating sleep. Disruptions in this process, such as exposure to blue light at night, can lead to sleep disturbances and circadian rhythm misalignment.

Cortisol Levels:

Cortisol, often called the "stress hormone," is also influenced by light exposure. During the day, natural light helps regulate cortisol production, supporting alertness and energy. However, reduced light levels can cause fluctuations in cortisol, leading to drowsiness, fatigue, and reduced stress resilience.

Threshold illuminance levels for various educational spaces:

SPACES	LIGHT LEVEL [FOOT CANDLES]	LIGHT LUX LEVEL
Classroom [General]	30-50 FC	300-500 Lux
Library [Reading/Writing]	30-50 FC	300-500 Lux
Retail Store	20-50 FC	200-500 Lux
Storage Room	5-20 FC	50-200 Lux
Cafeteria	20-30 FC	200-300 Lux
Conference Room	30-50 FC	300-500 Lux
Office Area	30-50 FC	300-500 Lux
Rest Rooms [General]	10-30 FC	100-300 Lux
Corridor	5-10 FC	50-100 Lux
Nursing Stations	15-30 FC	150-300 Lux
Professional Laboratory	75-120 FC	750-1200 Lux

READINGS



LOCATION	LUX READING	REMARKS
CLASS ROOM	1221	Acceptable
ADMIN OFFICE	085	Acceptable
PRINCIPAL ROOM	278	Acceptable
IQAC ROOM	272	Not Acceptable
STAFF ROOM	115	Acceptable
LIBRARY	126	Not Acceptable
IT LAB	120	Not Acceptable

Daylight Measurement: Light intensity values in certain areas were measured during daylight and compared against standard Lux values.

Classrooms: Lighting conditions in classrooms were measured, and the lighting seems adequate or in line with expected standards.

Library and IT Labs: The light intensity in these areas is observed to be poor and may not meet the required standards for optimal functionality.

HEALTH AND SAFETY MANAGEMENT

OBSERVATIONS

Cleanliness and Hygiene:

Regular cleaning of the college campus and toilets is effectively carried out by cleaning staff.

Tasks include dusting, floor cleaning, and toilet maintenance.

Garden and parking areas are maintained and kept clean by staff.

Cleaning staff are adequately equipped with cleaning tools and washing liquids.

Electrical Safety:

Electrical connections are compliant with IS/NBC (Indian Standards/National Building Code) standards.

Electrical doors are closed and secured.

No hanging cables or loose electrical connections are observed, ensuring safety from potential electrical hazards.

Fire Safety:

Fire extinguishers are installed in the campus building, and their renewal is managed on time before expiry.

However, sand buckets are not placed alongside fire extinguishers for additional fire safety measures.

NO VEHICLE DAY INITIATIVE

OBSERVATION

Since college currently doesn't practice "**No Vehicle Day**" and observes an average of 38-40 two-wheelers and 2-4 cars parked daily, it could be a good starting point to introduce the initiative gradually. Here's a refined approach to implement the "**No Vehicle Day**" while addressing the current usage patterns:

Gradual Introduction of "No Vehicle Day"

Pilot Phase: Begin with a "**No Vehicle Day**" once a month before gradually expanding to a quarterly practice. This will help the campus community adjust and encourage more participation.

Time Frame: Consider implementing the initiative on specific days like Fridays or Mondays when vehicle use might be lower, or in alignment with environmental awareness events.

The "**No Vehicle Day**" initiative described is a commendable step towards promoting sustainability and reducing the environmental footprint of the college community. Here's how the outlined plan can be enhanced and implemented effectively:

Key Objectives

Reduce CO2 emissions and air pollution caused by internal combustion engine vehicles.
Promote the use of sustainable transportation, such as electric vehicles (EVs) and bicycles.
Raise awareness about environmental issues and foster eco-friendly habits among students and staff.



OTHER ENERGY EFFICIENT, GREEN, WASTE REDUCTION PRACTICES BY THE COLLEGE MANAGEMENT.

OTHER WASTE MANAGEMENT (SCRAPS LIKE PLASTIC, PAPER, / E- WASTE/BIO WASTE MANAGEMENT)

E-WASTE MANAGEMENT

E-waste management refers to the proper disposal, recycling, and handling of electronic waste (e-waste) such as old computers, smartphones, televisions, batteries, and other electronic devices. Improper disposal of e-waste can lead to harmful environmental and health effects due to the toxic substances such as lead, mercury, and cadmium contained in many electronic components.

Effective e-waste management involves:

Collection and Sorting: Gathering e-waste and sorting it by type, such as printers, smartphones, and monitors, to ensure appropriate recycling.

Recycling: Recovering valuable materials like metals (gold, silver, copper) and plastics by breaking down devices. This reduces the need for mining raw materials and prevents pollution.

Reuse: Functional electronic items can be refurbished, repaired, or donated to extend their life cycle.

Disposal: For items that can't be recycled or reused, they must be disposed of in certified e-waste disposal facilities that ensure safe processing.

Public Awareness: Educating individuals and organizations on the importance of recycling e-waste, reducing electronic consumption, and promoting sustainable alternatives.

The environmental impact of the processing of different electronic waste components

E-Waste Component	Process Used	Potential Environmental Hazard
Cathode ray tubes (used in TVs, Computer Monitors, ATM, Video Cameras & More)	Breaking and removal of yoke, then dumping.	Lead, Barium and other heavy metals leaching into the ground water and release of toxic phosphor
Printed Circuit Board (Image behind table – a thin plate on which chips and other electronic components are placed)	De- Soldering and removal of computers chips, open burning and acid baths to removal metals after chips are removed.	Air emissions and discharge into rivers of glass dust, tin lead, brominated dioxin, beryllium, cadmium and mercury.
Chips and other gold-plated components	Chemical stripping using nitric and hydrochloric acid and burning of chips	PAHs, heavy metals, brominated flame retardants discharged directly into rivers acidifying fish and flora. Tin and lead contamination of surface and groundwater. Air emissions of brominated dioxins, heavy metals and PAHs
Plastics from printers, Keyboards, Monitors etc.	Shredding and low temp melting to be reused.	Emissions of brominated dioxins, heavy metals and hydrocarbons
Computer Wires	Open burning and stripping to remove copper.	PAHs released int air, water and soil

OBSERVATIONS

The institution segregates usable and waste parts of electronic equipment. Usable parts are stored separately and are used in future

The college's initiative to manage E-waste responsibly aligns with sustainable practices and compliance with the E-waste Management Rules, 2022. Partnering with Threco ensures a systematic approach to recycling and reducing environmental impact

The data on E-waste generation and its disposal is available. There is documented policy for collection, segregation of e-waste.





OBSERVATION AND SUGGESTION FOR PAPER WASTE MANAGEMENT

The college’s approach to paper waste management demonstrates a proactive commitment to sustainability and resource efficiency. Let’s look at the implemented measures in detail:

Double-Sided Printing and Photocopying

Impact: Reduces paper usage by nearly 50%, significantly cutting costs and minimizing environmental impact.

Implementation: Printers and copiers are set to default double-sided printing modes, encouraging efficient usage without additional effort from users.

Digitalization Through Scanning

Impact: Eliminates the need for physical storage and hard copies of documents. This also ensures better accessibility and document longevity.

Implementation: Staff and students are encouraged to scan and save documents digitally rather than print them, promoting a paperless environment.

Availability of E-Books and Online Journals

Impact: Students and faculty can access study materials without the need for printed books or journals, significantly reducing demand for paper-based resources.

Implementation: The college library has an extensive digital collection of e-books and journals available to all users through a central portal, making learning resources accessible anywhere and anytime.

Recycling Paper Waste Through Local Vendors

Impact: Ensures that all waste paper is processed and repurposed, reducing the burden on landfills. This also supports the local economy by partnering with nearby recycling vendors.

Implementation: The college collects paper waste through designated bins, segregates it, and collaborates with local recycling units to process the waste responsibly.

Overall Benefits

Environmental: Reduction in paper waste supports forest conservation and reduces carbon footprints.

Economic: Saves money on paper procurement and waste management.

Cultural: Creates a sustainability-oriented mindset among students and staff, preparing them to adopt eco-friendly practices in their lives.

PLASTIC WASTE MANAGEMENT

The Nature Club is proud to announce the **Plastic Minimalism Project** for a Green Campus' a week-long initiative aimed at reducing

College follows the guidelines regarding plastic usage and try to prohibit the use of single use plastic e.g. carry bags, glasses, spoons etc. on the campus.

College is also following 'Plastic Free Campus drive through various poster/sign boards at number of places in the college campus and buildings.

The College can organize 'Plastic Collection Drive 'on the campus on a regular basis.

Activities conducted in college to strengthen plastic management efforts in campus:

Plastic Audit Day

Comprehensive audit is conducted to identify the sources and types of plastic waste generated on campus and data to create actionable goals for reducing plastic use.

Plastic Alternatives Fair

Fair is organised showcasing eco-friendly alternatives to plastic products, such as reusable bags, biodegradable utensils, and metal straws.

local vendors and startups are invited for specializing in sustainable products.

Workshops on DIY Upcycling

sessions on repurposing plastic waste into useful items like planters, storage containers, or decor are conducted

Students are encouraged to bring their plastic items to upcycle during the workshop.

Eco-Club Collaboration

Partner with the Nature Club and other student organizations to amplify efforts and share resources.

Plastic-Free Cafeteria Challenge

Cafeteria is encouraged to switch to biodegradable or reusable cutlery and containers. Reward customers who bring their reusable dishes or cups.

Art from Waste

Exhibition is conducted where students create sculptures or installations using discarded plastic, highlighting its environmental impact.

Plastic Waste Collection Drive

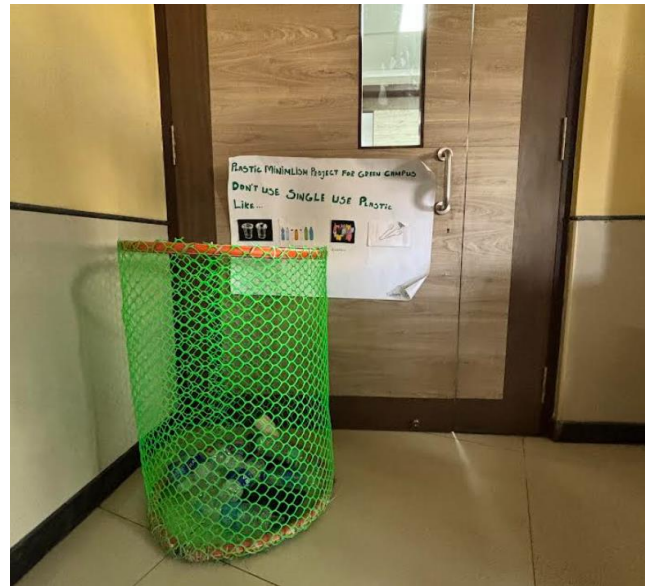
Monthly drives is conducted where students and staff collect and segregate plastic waste from campus and nearby areas for recycling.

Guest Lectures and Seminars

Environmentalists or waste management professionals are invited to speak about sustainable practices and innovative plastic reduction methods.

Bring Your Own" Campaign

BYO (Bring Your Own) culture is promoted in college campus for water bottles, coffee mugs, and lunch containers to reduce disposable plastic waste.



SOLID WASTE MANAGEMENT

Wet waste and dry waste segregation is practiced in the premises. separate bins are provided for wet biodegradable and dry recyclable waste. Combined waste is directly handed over to the municipality vehicle on daily basis . Most of solid waste is generated at canteen premises.

There is signage on the food wastage or segregation of wet and dry waste.

In other areas like classrooms, it is mostly paper waste and plastic wrappers.

Segregation at Source

Separate Waste Bins: Provide separate bins for biodegradable, recyclable, and non-recyclable waste in classrooms, cafeterias, hostels, and other areas.

Colour Coding: Use color-coded bins (e.g., green for organic waste, blue for recyclables, red for hazardous waste) for easy segregation.

Composting Organic Waste

Composting Units: Install composting bins or vermicomposting pits for food and garden waste.

Output Use: Use the compost produced as fertilizer for landscaping and gardening on campus.

Solid Waste Management and Composting are vital components of a sustainable waste disposal strategy, particularly on a college campus. Here's a detailed approach tailored to managing solid waste and integrating composting effectively:

Waste Categorization and Segregation

Biodegradable Waste: Food scraps, garden waste, and organic materials.

Non-Biodegradable Waste: Plastics, metals, glass, and other recyclables.

Hazardous Waste: Laboratory chemicals, e-waste, or medical waste.

Special Collection Bins: Install color-coded bins at key locations.

Collection and Transportation

Designate a team to ensure regular waste collection and transportation to sorting centers or composting areas.

Use eco-friendly waste transportation systems like handcarts.

Recycling Programs

Collaborate with local vendors or agencies to recycle paper, plastic, and metal waste.

Promote upcycling and encourage art or utility projects using recyclables.

Composting as a Key Practice

Composting turns biodegradable waste into nutrient-rich fertilizer for gardens and green spaces.

Types of Composting Suitable for Campuses

Vermicomposting:

Uses earthworms to break down organic waste.
Produces nutrient-rich vermicompost for plants.
Requires a moist environment and shaded composting bins.

Aerobic Composting:

Organic waste is broken down in the presence of oxygen.
Can be done using compost pits, bins, or tumblers.
Regular turning ensures even decomposition.

Steps to Implement Composting on Campus

Set Up Composting Units

Identify a location near gardens or green spaces.
Install bins, pits, or tumblers depending on the type of composting chosen.

Waste Collection System

Collect food waste from cafeterias, hostels, and classrooms daily.
Ensure proper segregation to avoid contamination of compostable materials.

Utilization of Compost

Use the compost in landscaping, gardening, or creating a vegetable garden.
Surplus compost can be sold to local farmers or used for social projects.

Benefits of Combining Waste Management and Composting

Environmental Impact: Reduces landfill waste and methane emissions.
Economic Benefits: Cuts costs on chemical fertilizers by using organic compost.
Awareness and Sustainability: Encourages students and staff to adopt eco-friendly habits.



Vermicomposting using hand tumbler

Waste generated from the canteen is converted into manure using a decompose process, in both hand tumblers and ground pit.



BIO- WASTE MANAGEMENT

The waste generated in various hospitals, health care facilities, colleges can be grouped under Bio waste management. The Constituents of this type of waste are various infectious and hazardous materials. This waste is then identified, segregated and treated scientifically.

YELLOW BAGS	RED BAGS	BLUE BAGS	BLACK CARBOY
Infectious waste, bandages, gauze, cotton or any other objects in contact with body fluids, human body parts, placenta etc.	Plastic waste such as catheters, injection syringes, tubings, iv bottles	All types of glass bottles and broken glass articles, outdated & discarded medicines	Needles without syringes, blades, sharps and all metal articles.

The college has a well-maintained vending machine for student and staff use, along with a properly functioning napkin burner. Additionally, the degree college does not generate any hazardous waste..



College can tie-up with 'Pad Care' for sanitary pad disposal. Pad Care is an organization which collects & recycles sanitary pads using eco-friendly methods and produces products such as paper, plant pots etc.

Pad Care is an automated hygiene management system that generates harmless, recyclable output of used sanitary napkins.

Through multi-step mechanics, it breaks down absorbent sanitary waste into two by-products, cellulose, and plastic.



Things we made from the collected pads

Upholding our commitment to making sanitary waste planet-friendly, we made some heartfelt stationery products with 100% safe-to-use output extracted from the sanitary pads we collected from your workplace.
Available at discounted prices for all our clients.



Positivity on-the-go Affirmation Station
 Designed to inspire peace, ease, and joy within you and those you love.
Size 7.4 x 10.5 cm
Pages 31



Dried-flowers inspired Notebook
 Your own little space to manifest your ideas and dreams or just an outlet to let your creativity flow.
Size 10.5 x 14.8 cm
Pages 20



Strawberry-inspired Mini-calendar
 Cherish the year 2023 and keep tab on your days, weeks, and months.
Size 5.2 x 7.4 cm
Pages 12



Vintage Typewriter To-do List
 Classic abode for documenting tasks, meetings reminders, and bucket lists.
Size 7.4 x 21.1cm
Pages 30

www.padcarelabs.com | 9022822458

PADCARE CONTACT DETAILS: + 91 9022822458

email: info@padcarelabs.com

FEW OBSERVATIONS

Which of the following are found near your college campus?

- Municipal dump yard - No
- Garbage heap - No
- Public convenience - Yes
- Sewer line - No
- Stagnant water- No
- Open drainage - No
- Industry – No
- Bus/Railway Station - Yes
- Market/ shopping complex/ public halls - Yes
- Waste – No

Does your college campus generate any waste?

- Hazardous waste (toxic) – No Toxic is generated in college
- Solid waste – Yes (Generated by Canteen)
- Dry leaves - Yes
- Canteen waste – Is properly collected in a wet dustbin and disposed off every morning.
- Liquid waste – Yes (Sewage and Pipelines)
- Glass - No
- Unused equipment's - No
- Medical waste any – No
- Napkins – yes (Separate bins for Napkins are provided in girls washroom)

Is waste polluting the air of college campuses?

No

Do you use recycled paper in college?

As far as possible college try to keep our affairs paperless. However, whenever needed, college try to reuse papers as and when possible.

How would you spread the message of recycling to others in the community? Have you taken any initiative please specify.

Each time we communicate with our students. Conduct activities like Best out of Waste, Welcome to guest with basil saplings. Gift to students.

Can you achieve Zero Garbage in your college? (Reduce, Recycle, Reuse, Refuse) if yes, How?

Use durable reusable items instead of disposable such as washable cups, plates and cutlery.

Go paperless whenever possible.

College set printers to automatically print double sided .

Reduce or remove trash can liners where feasible.

College have given instructions to our teaching and non-teaching staffs also regarding reduce, recycle and reuse.

Instead of printing hard copies of your documents save them to your hard drive or email them to yourself to save paper.

Make your printer environmentally friendly. Change your printer settings to make double sided pages.

Use small point fonts when possible.

Pay your bills e-billing programs, when possible, to save papers.

Use paperclips (over staples) when possible.

Reuse envelopes with metal clasps and reuse file folders by sticking a new label over the previous one.

List usage of water in your campus

The institute makes use of water for various purposes namely cleaning, sanitation, drinking and gardening.

What are the sources of water in your campus?

The institute depends on municipal corporations for supply of water.

No. of motors used for pumping water

There are 7 motors in the College for pumping water.

What is the total horsepower of each motor?

The horsepower of the motors is 200/250 Kwh

Quantity of water pumped every day (in liters)

Approximately 10,000 Liters of water is pumped every day.

If there is water wastage, specify why?

The college takes appropriate measures to save and conserve water. Regular maintenance of water taps tanks is done by the institute in order to avoid wastages due to tank leakages or any other allied reasons.

No. of water taps

A total of 53 water taps were seen out of which 24 water taps are used for drinking purpose, taps are used for cleaning and sanitation and 29 taps are used in toilets.

No. of toilet, urinals

Every floor has washrooms.

Amount of water used per day for garden use.

The average consumption of water per day for gardening purposes is 150 litres.

Is drip irrigation used to water plants outside? (Yes(✓) /No)

No.

Quantity of water used for vehicle cleaning.

The institution does not allow cleaning of vehicles in the premises Hence, water is not used for cleaning of vehicles.

How often is the garden watered?

The garden is watered everyday.

Are there any water savings techniques allowed on your campus?

We observed that the institute implements the practice of regular maintenance and upkeep of water tanks and taps to avoid wastage of water.

List of Medicinal Plants found in College Campus

Since medicinal plants are scarce on campus, initiating a medicinal garden could be an excellent project. This would enhance the campus environment, promote biodiversity, and serve as an educational resource for students.

Here is a list of medicinal saplings suitable for planting in a college environment, promoting a greener campus and offering educational and therapeutic benefits:

Common Medicinal Plants**Neem (*Azadirachta indica*)**

Benefits: Antibacterial, antifungal, air purifier.

Tulsi (*Ocimum sanctum*)

Benefits: Antioxidant, stress-relief, mosquito repellent.

Aloe Vera (*Aloe barbadensis*)

Benefits: Skin care, wound healing, air purifier.

Ashwagandha (*Withania somnifera*)

Benefits: Stress-relief, improves immunity.

Giloy (*Tinospora cordifolia*)

Benefits: Immunity booster, antipyretic.

Amla (*Phyllanthus emblica*)

Benefits: Rich in Vitamin C, immunity booster.

Lemongrass (*Cymbopogon citratus*)

Benefits: Digestive aid, mosquito repellent.

Hibiscus (*Hibiscus rosa-sinensis*)

Benefits: Good for hair care, antioxidants.

Turmeric (*Curcuma longa*)

Benefits: Anti-inflammatory, antiseptic.

Stevia (*Stevia rebaudiana*)

Benefits: Natural sweetener, diabetes-friendly.

AUDITING FOR CARBON FOOTPRINTS:

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels such as petrol.

The most common greenhouse gases are carbon dioxide, water vapor, methane, nitrous oxide and ozone of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere.

The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact.

In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprints are, based on the amount of carbon emissions created.

One aspect is to consider the distance and method travelled between home and college everyday. It undertakes the measure of bulk carbon dioxide equivalents exhaled the organisation through which the carbon accountings are done.

It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examine its carbon footprints.

Carbon footprint is the total sum of greenhouse gases (GHG) emission caused by an organization, event, product, or person. As we are aware, the increasing concentration of GHGs in the atmosphere can accelerate climate change and global warming, it is very necessary to measure these emissions from our day-to-day activities.

The first step towards managing GHG emissions is to measure them. There are some standards and guidelines to measure GHG emissions like GHG protocol, ISO 14064, the more comprehensive one Life Cycle Assessment (LCA), and market-based mechanisms.

Out of them, ISO 14064 is an offset protocol and independent, voluntary GHG project accounting standard helps to quantify GHG emission of the organization, event, product, or person.

Our day-to-day activities are dependent on electricity which is mostly coming from coal based power plants, Diesel and Petrol for our vehicles and LPG for cooking in our kitchen.


All the energy we use is derived from these fossil fuels which are GHG intensive. The following methodology helps you to calculate your carbon footprint resulting from the use of Electricity, Petrol, Diesel, and LPG.

CARBON ABSORPTION BY FLORA IN THE INSTITUTION

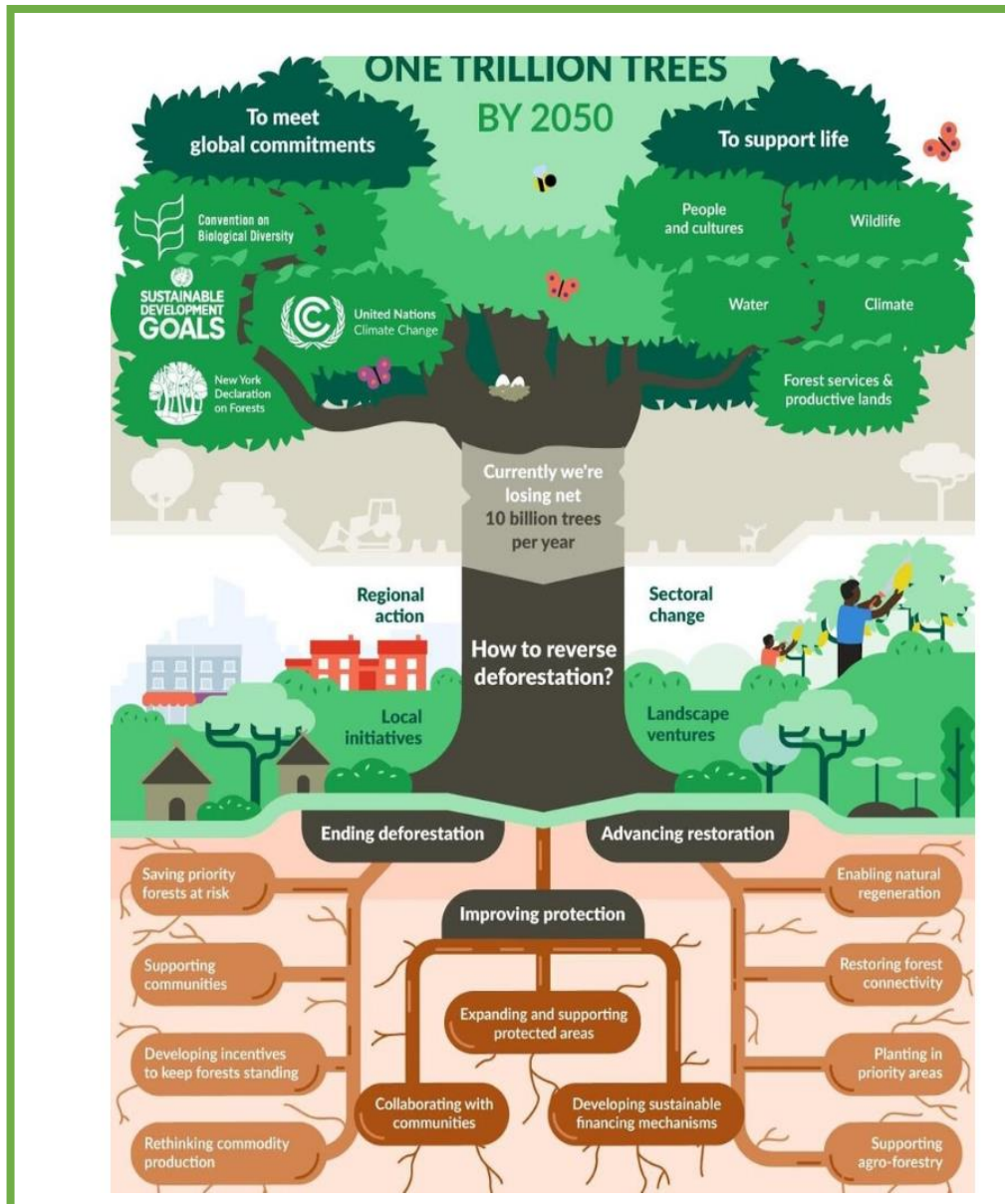
Carbon absorption capacity of one full grown tree 22 kg CO₂ , There fore it is suggested to plant more big trees.

THE BEST TREES FOR CARBON SEQUESTRATION ARE

Soil organic carbon stock (mg/m³)		Carbon content and sequestration		
Species	Mean value	Species	CO ₂ content (kg/tree)	CO ₂ sequestration (kg/tree)
Teak	0.18	Nilgiri	439	1,610
Nilgiri	0.15	Saru	335	1,229
Sevan	0.16	Chinaberry	202	728
Saru	0.25	Sevan	146	536
Chinaberry	0.21	Teak	32	118
Open field	0.12			



EFFORTS TO SAVE THE EARTH



The carbon footprint measures the impact on the planet in terms of how many greenhouse gas emissions we emit directly or indirectly in our daily activities as an organisation.

Assessment of Carbon Footprint –

Carbon Footprint of college Campus has been assessed using four basic steps, by setting the organizational boundary, setting operational boundary and collection of data and finally calculation of emissions using appropriate emissions factors.

The emissions inventory includes emissions generated by the activity at the organisational level, such as emissions generated directly and indirectly by the use of the offices.

Emission Activities			
Scope	Category	Emission Activities	Activity data
Scope I	Direct Emission	LPG use In canteen & mess	Gas in Kg
Scope II	Indirect Emission	Electricity consumption	kWh of electricity purchase
Scope III	Other Indirect Emission	goods and services used by the organisation ,	Origin and destination of the travel and type of transport used
		Student and staff Commuting	Survey Regarding Travelling
		Waste Generation in Organization	Transport Details
		Business Travel	Transport Details

Data Collections – Two types of data were collected namely activity data and Emission Factors.

Since sampling is not carried out for this kind of study, activity data were collected from all activities within the defined boundaries for one-year period.

Specially, commuting data were collected from all employees of the office as well. Parameters and relevant sources of the activity data related to each and every operation.

Aspects	Parameters of Activity Data	Sources
LPG - on site	LPG consumption Annually (kg)	Invoices
Electricity – on site	Electricity consumption Annually (kWh)	Electricity Bills
Commuting	Distance traveled annually (km) -Average fuel efficiency of Vehicles -Type of vehicle -No of days per week traveled -No of weeks per year worked in the office -Type of fuel -Average No. of persons	questionnaire
Waste Disposal	Amount of waste generation in daily routine	questionnaire
Purchase goods & Services Transportation	Distance traveled	Purchase Book
Business Travel	Distance traveled	questionnaire

Emission Factors have been developed with the use of **2006 IPCC Guidelines for National Greenhouse Gas Inventories**, which can be used to the derivation of Emission Factors for any activity at any place in the world.

Emission Factors

Activity	Emission Factors
LPG	2.98 kg/kg
Electricity	0.85 kg/kWh
Petrol	2.27 kg/lit
Diesel	2.64 kg/lit

Understanding the Carbon Emission Factor (LPG)

LPG primarily consists of propane (C₃H₈) and butane (C₄H₁₀).

The average carbon emission factor for LPG combustion is 2.983 kg CO₂ per kg of LPG.

Apply the Formula

Carbon Emissions (kg CO₂)=LPG Consumed (kg)×Emission Factor (kg CO₂/kg)

Result & Analysis...

Results of Carbon Emission for Scope 1

The results of the carbon footprint calculation for by scope 1 are detailed below.

MONTHLY USAGE OF CYLINDER BY CANTEEN	FOR ONE YEAR 4 x 12 (QTY)	19KG GAS / CYLINDER	CARBON EMISSION (2.983KG/KG)
4	48	912	2720.496
TOTAL Co2 EMISSION (TON)		2720.49	

Scope I is related to fuel which is use under the campus premises by canteen mess. The total carbon emission of **scope I is 2720.49 ton.**

Understanding the Carbon Emission Factor (ELECTRIC)

Electricity Consumption: Measure in kilowatt-hours (kWh). This data can be obtained from your electricity bill.

Emission Factor: This is the amount of CO₂ emitted per kWh of electricity consumed. It varies depending on how electricity is generated in your region (coal, natural gas, renewables).

For example:

Coal-heavy grids: ~0.85–1.0 kg CO₂/kWh.

Mixed grids (coal + renewables): ~0.4–0.6 kg CO₂/kWh.

Renewable-dominant grids: ~0.1 kg CO₂/kWh or less.

Apply the Formula

Carbon Emissions (kg CO₂) =Electricity Consumption (kWh)×Emission Factor (kg CO₂/kWh)

Result & Analysis...

Result of Carbon Emission for Scope II

Category		LT- I (B)		Carbon Emission (kwh x kg Co2/ kwh)
Month	Units	Total Bill	Average Unit Rate	
Month	kWh	INR	INR/kWh	
DEC	13665	228695	17	11615.25
JAN	15174	265249	17	12897.9
FEB	12073	192261	16	10262.05
MARCH	15639	252237	16	13293.15
APRIL	17170	310660	18	14594.5
MAY	11878	259861	22	10096.3
JUNE	18655	351773	19	15856.75
JULY	14893	355819	24	12659.05
AUGUST	28160	406792	14	23936
SEPTEMBER	21128	393927	19	17958.8
OCTOBER	24765	425070	17	21050.25
NOVEMBER	24684	412448	17	20981.4
TOTAL	217884	3854792	216	185201.4 ton

Scope II is related to indirect emission which emit by purchase electricity. The carbon emissionby electricity is **185201.4 ton**.

A typical 1 kW solar panel system can produce around 1,200–1,500 kWh per year, depending on location. This avoids approximately **0.84–1.5 metric tons of CO₂ per year** (based on average global emission factors of 0.7–1 kg CO₂ per kWh from fossil fuels).

AUDITING FOR ENERGY MANAGEMENT

Energy: An Invisible Force with Visible Effects

Energy, though unseen, manifests through heat, light, and power, shaping our daily lives and institutional operations. Recognizing its significant environmental impact, addressing energy use becomes a critical pillar of sustainability in campuses.

Importance of Energy Management in Campuses

Energy consumption, sources, and monitoring play crucial roles in determining the ecological footprint of an institution. The use of energy-efficient technologies and conservation practices not only reduces operational costs but also mitigates environmental degradation.

For example, traditional incandescent bulbs consume approximately 60W to 100W, while energy-efficient LEDs require significantly less energy, often under 100W, delivering the same or better performance. This stark contrast underscores the potential for energy-saving transformations.

Role of Energy Auditing

Energy auditing is a systematic process that identifies opportunities to conserve energy and optimize its usage. By examining energy practices, institutions can:

- Identify wasteful usage.
- Transition to renewable energy sources.
- Minimize their environmental impact.

An audit acts as a foundational tool to guide the adoption of energy-efficient technologies and sustainable practices.

Energy Practices for Sustainable Campuses

Lighting Optimization

- Replace incandescent and CFL bulbs with LEDs.
- Install motion sensors and automatic timers for lighting control.

Energy Sources

- Incorporate renewable sources such as solar and wind energy.
- Use solar panels for lighting, water heating, and power generation.

Sustainable Transportation

- Develop infrastructure for solar-powered vehicles.

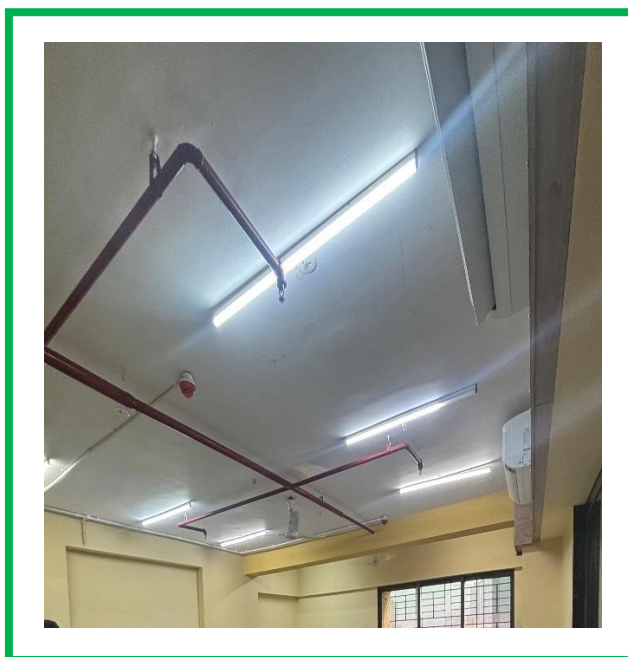
Awareness and Policy

Organize awareness programs for staff and students on energy conservation.
Formulate institutional policies promoting energy efficiency.

ENERGY PERFORMANCE ASSESSMENT OF LIGHTING

SUMMARY OF LED LIGHTINGS IN COLLEGE

College has 100% new energy efficient LED lighting in the college building. By opting Led Lights all over the college it has reduced the energy consumption load



Existing Usage Table			
	Tube light	Led Lights	Old Fans
No of Units	0	498	269
Energy Consumption Per Unit (watt/hour)	0	24	80
No of Hours usage per day	0	8	8
No of days used in a month	0	25	25
Monthly Consumption (Kilowatt/hour)	0	3824.6	6886.4
Recommended			
	Energy Efficient LED LIGHTS	Led Lights	Energy Efficient FANS
No of Units	0	0	269
Energy Consumption Per Unit (watt/hour)	0	0	28
No of Hours usage per day	0	0	8
No of days used in a month	0	0	25
Monthly Consumption (Kilowatt/hour)	0	0	2410.2
Energy Consumption Reduced	0	0	4476.2

ENERGY SAVING MEASURES AND RECOMMENDATION

It is recommended that efficiently utilize the available daylight in the college building and class rooms.

Switched off unnecessary lighting during day time when sun light is available in the premises which saves up to 10 to 30 % of energy saving in the lighting's energy consumption.

Light is switched off in all , Rooms toilet blocks which saves up to 30 to 40 % energy in lighting.



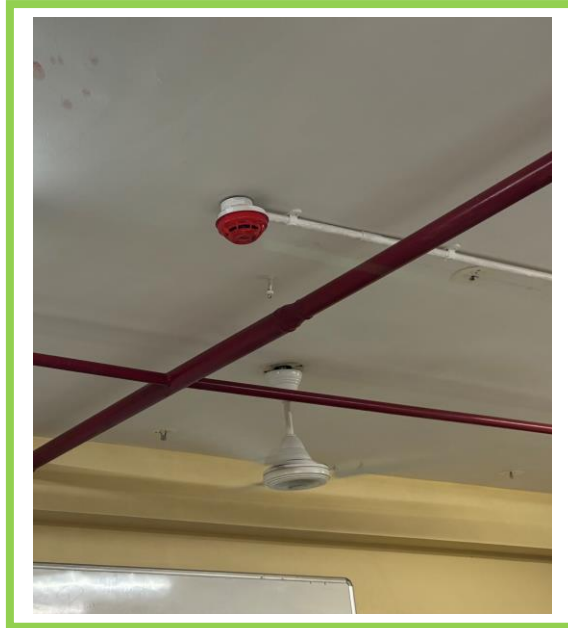
ENERGY PERFORMANCE ASSESSMENT OF FAN

SUMMARY OF FANS IN COLLEGE OBSERVATION

College has installed old conventional induction motor fans which consumes 70W – 80W at full speed.

Also exhaust fan which consumes 45w at full speed are installed at various places like class rooms, toilet blocks, canteen etc.

It is recommended that replaced old ceiling fans and exhaust fans with new energy efficient BLDC motor fans which consumes 28W and 12W respectively at full speed which consumes almost 50% of energy consumption in fans.



OLD CONVENTIONAL INDUCTION MOTOR FAN

ENERGY PERFORMANCE ASSESSMENT OF AIR CONDITIONING UNITS

OBSERVATION

Installed System:

The college has installed split air conditioning units across its premises.

Temperature Settings:

During the audit, it was observed that the ACs are consistently set to 24°C at various locations.

Maintenance:

The college has an Annual Maintenance Contract (AMC) in place for all AC units, with servicing scheduled every six months.

Savings Measures and Recommendations:

Optimal Temperature Settings:

Maintain the temperature settings at 24°C in all areas to optimize energy consumption while ensuring occupant comfort. This setting strikes a balance between energy savings and thermal comfort.

Regular Maintenance:

Continue the existing AMC program to ensure regular maintenance of AC units. Routine cleaning of filters, coils, and ducts should be emphasized to maintain efficiency and avoid unnecessary energy losses.

Use of Energy-Saving Features:

Encourage the use of energy-saving modes and programmable thermostats (if available) on the installed split ACs to further reduce energy consumption.

Preventative Measures for Peak Efficiency:

Inspect and ensure the refrigerant levels are optimal during each AMC service.
Check for proper insulation around air ducts to prevent thermal losses.

Awareness and Training:

Educate staff and students on the importance of keeping the temperature consistent at 24°C and the need to avoid unnecessary adjustments to the thermostat.

Usage Scheduling:

Implement a usage schedule to ensure ACs are turned off in unoccupied spaces, particularly during holidays or non-operational hours. Installing motion sensors or timers can automate this process.

Energy Performance Monitoring:

Install energy meters for individual units to monitor their performance and detect inefficiencies early. Analyze energy consumption patterns periodically to identify opportunities for improvement.

Upgrade Considerations:

For older units, consider upgrading to more energy-efficient models, such as those with inverter technology, which adjusts compressor speed based on cooling demand, leading to significant energy savings.



OTHER ENERGY CONSERVATION MEASURES

College in future can implement the **“heat repellent paint”** to reduce the temperature in the rooms.

List ways that you use energy in your college campus (Electricity, LPG, firewood, Petrol, Diesel and other)

The college makes use of Tara Power Electricity as source of Energy

How many photocopiers are installed by your college campus? Mention use (hours used / days for how many days in a month)

College has 7 printers, 2 photocopier machines installed in its premises.

Energy used by each photocopier per month?

The photocopier uses 1Kwh (Approx) of energy per month.

How many inverters & Generators your college campus has installed? Mention used hours/days for how many days in a month.

None

No. of TV and Projector in your college?

There are 02 Tv and 08 Projector in college.

No. of PC in college

There are 119 PC's

No of CCTV in college campus

There are 49 CCTV

Does College run 'Switch Off' drills at your college campus?

Yes, the institute asks the students to switch off lights and fans when not in use and practise energy saving slogan on wall in classroom, IT lab and at college premises.

Is computers and other equipment put on power saving mode?

Yes, all the computers in the institute are used in power saving mode.

Does College machinery (TV/AC/Computer Printer etc.) run on standby mode most of the time?

Yes, the equipment in institute can be used on standby mode as well.

Write a note on the methods / Practices/ adaptations by which you can reduce the energy use in your college campus in future.

In our visit, we observed the following things with respect to energy saving practices:

- 1) Lights or appliances are turned off when not in use.
- 2) Appliances are unplugged when not in use.
- 3) The institute make use of LED bulbs in most of rooms instead of traditional incandescent bulbs in future.
- 4) Whenever possible the institute tries to purchase energy efficient appliances.

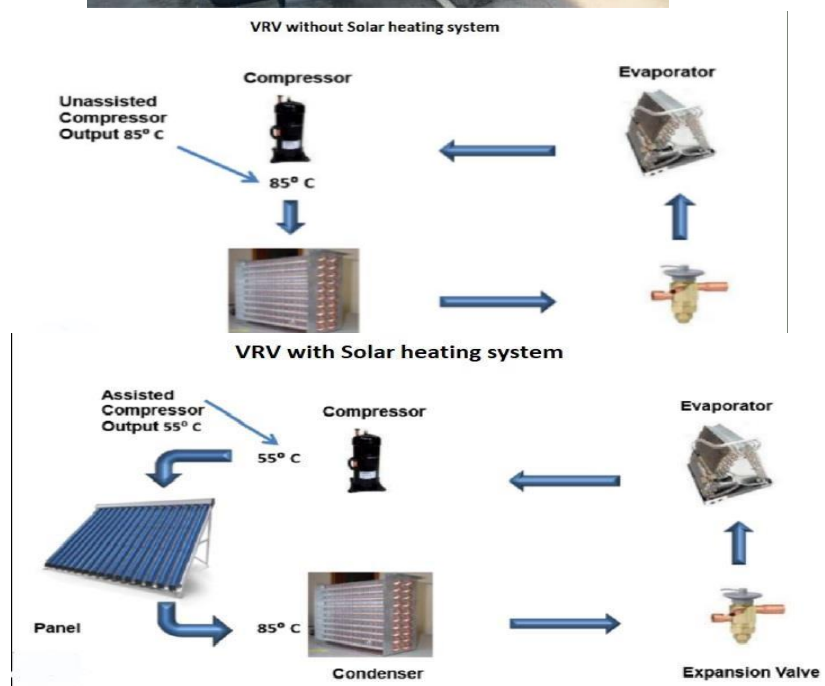
SAVING IN VRV SYSTEM (SOLAR THERMAL COOLING SYSTEM)

It is **recommended** college should install “Solar heating system” or “Solar thermal cooling system” for VRV to reduce the energy consumption by 30%.

VRV System with Solar Heating or Solar Thermal Cooling System



VRV without Solar heating system



SAVINGS MEASURES

SOLAR POWER GENERATION

There is a Solar Photovoltaic (SPV) unit for Power Generation with capacity 48 kW. The SPV is connected with the LT supply with some relay/sensor which keeps senses of electrical supply. When there is electrical supply, the SPV will generate electricity. As the electrical supply goes off, the SPV will not generate any electricity. SPV will also not generate electricity when there is electrical supply of DG set.

The best use of SPV is to put all lighting, exhaust fan load, fan load etc. on it. Some intelligent relay/ sensor needs to install for better management. The energy meter should also be calibrated by third party once in a year or two years. This way, the SPV will continue supply even there is utility supply available or not and it will also help in saving a substantial amount in the electricity bill.

SOLAR PV SYSTEM WITH NET METER

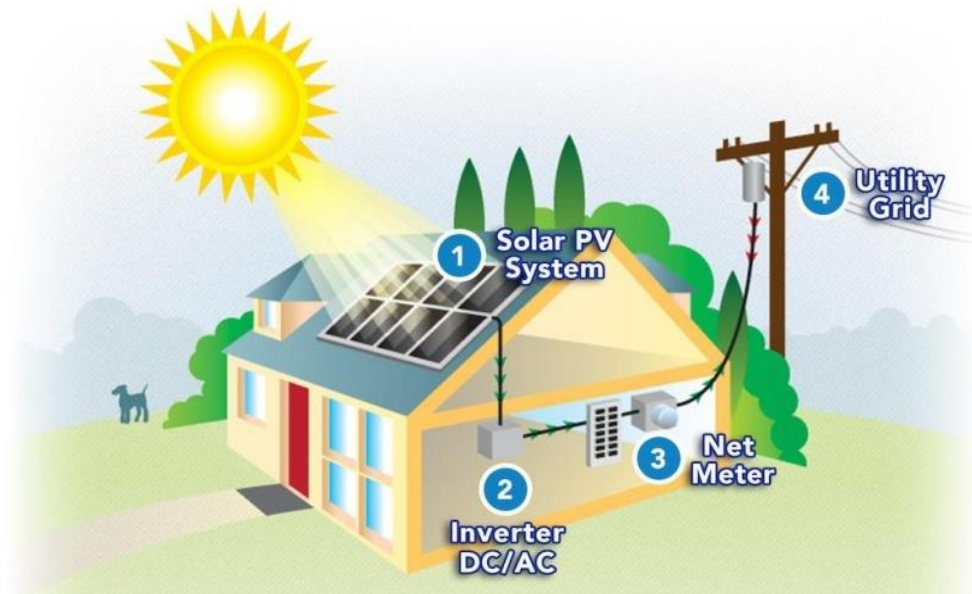
INTRODUCTION



Solar photo voltaic system-with Net meter

Government has new solar energy policy name as “Rooftop Solar with Net Meter system”. Maharashtra government encourages to install rooftop solar PV system with net meters at available roof top of consumers. This helps to reduce the burden on existing conventional fuel fired power plants in the country.

Solar Rooftop Net meter system helps consumers to reduce the electricity consumption in the electricity bill due to net meter.



OBSERVATION

College has no solar Panel Installed.

ENERGY EFFICIENT EQUIPMENTS AND AWARENESS

INTRODUCTION

Energy efficiency is one of the most effective and accessible strategies for saving money, reducing greenhouse gas (GHG) emissions, and meeting the growing global energy demand. By optimizing energy use, we can achieve significant environmental, economic, and systemic benefits.

Environmental Benefits: Enhanced energy efficiency reduces GHG emissions such as carbon dioxide (CO₂) and other pollutants. It also helps conserve natural resources, including water, through more efficient energy production and consumption.

Economic Advantages: Energy efficiency can decrease individual utility costs and stabilize electricity prices by reducing market volatility.

Utility System Improvements: Lowering overall energy demand reduces the necessity for investments in new electricity generation and transmission infrastructure, delivering long-term utility benefits.

Risk Mitigation: Diversifying utility resources through energy efficiency mitigates risks associated with fluctuating fuel prices and enhances energy security.

College Visuals and NSS Activity Visuals

Spacious Classroom



N.A.AC & P.H.E ROOM



Ramp for Specially abled student



Washroom for specially abled student



Admin Office



Principal Office



Conference room



Faculty Room



Examination Room



COMPUTER LAB



PSYCHOLOGY LAB



LIBRARY



Beach Clean up Drive



Van Mahostav Day



World Environment Day



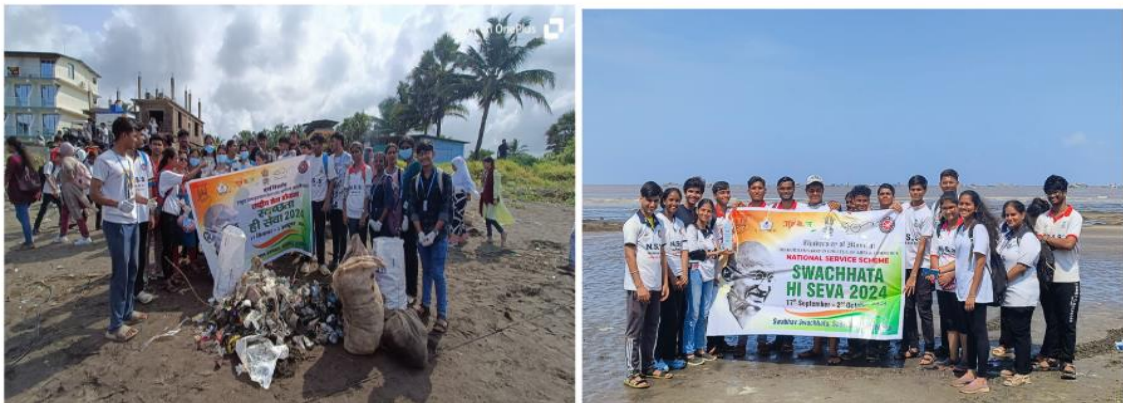
E-waste Seminar



Teacher Trail



Swachhata he Seva



Joy of Giving



It's a great initiative by your college! Establishing a lab like **GO SHOONYA** focused on carbon elimination aligns perfectly with the global and national goals of combating climate change. Here's how such a lab could make a real impact:

Shoonya Waste Management

Step 1: AWARENESS

Team Shoonya walks door to door spreading awareness among the homemakers and residents of the societies (clusters) guiding them about the importance of segregating the waste. We also do this campaign through "Nukkad Natak", Posters, Banners etc.

Step 2: COLLECTION

We also collect the dry waste by going door to door. Installation of "Shoonya Bins" at every society is done so that they can easily keep the segregated waste. Our E-vehicle "Shoonya Rath" carries that dry waste to our Shoonya lab.

Step 3: SEGREGATION

Once the dry waste is brought at our Shoonya lab, it is washed and cleaned; after which segregation is done based on types of paper and plastic. All dry waste is kept separately as per their categories.

Step 4: RECYCLING

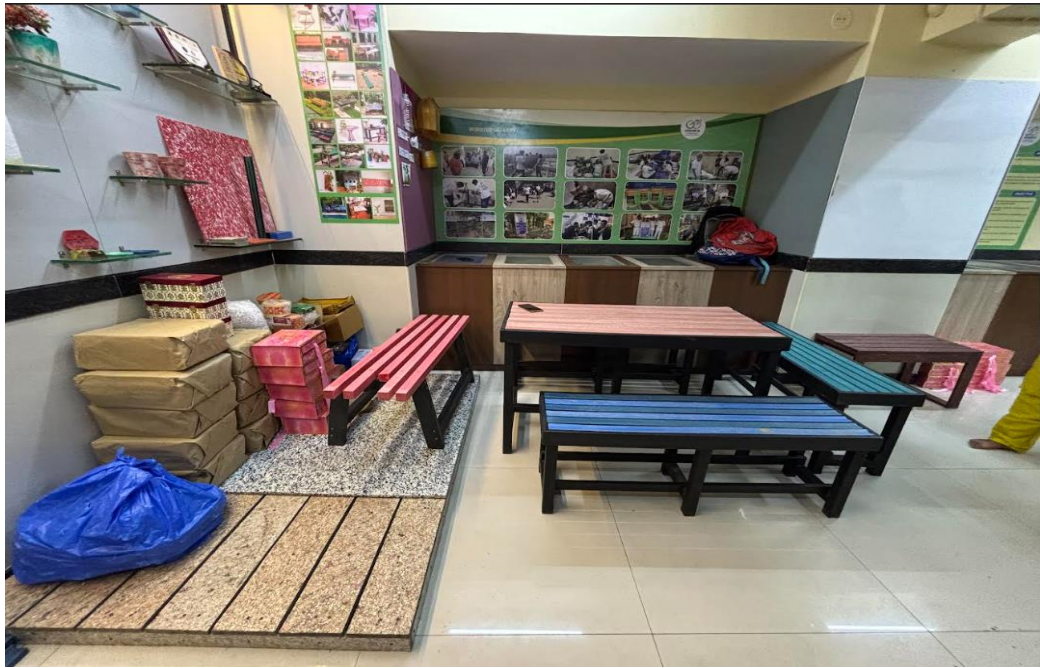
All the segregated waste is cleaned, shredded into flakes and moulded into desired products. Where we have our own in-house expertise for the same. We have developed a scalable and replicable model which is also circular economy based model that can be implemented across the nation.

Carbon Shoonya Bharat" Vision:

Support India's commitment to achieving **Net Zero Emissions by 2070**, as announced in COP26.

Engage students in projects that contribute directly to reducing India's carbon footprint.







I take this opportunity to thank for all the support provided during the implementation of Green Audit.

**For
Thakur Ramnarayan College of Arts & Commerce**

**For
Unique Assessment Systems**



Name: Dr. Ravish R Singh

Designation: Principal



Name: Sunil Nair

Designation: Project Head