GREEN, ENERGY, & ENVIRONMENT AUDIT REPORT

R V Institute of Management, Bengaluru

PREPARED BY

NISARGA

eco CONSULTANTS

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CERTIFICATE
GREEN AUDIT

PRESENTED TO:

R V Institute of Management, Bengaluru

Our team of Environmental Engineers have analyzed Green practices followed by the Institution*.

This certificate was awarded by:

NISARGA ECO CONSULTANTS

NISARGA
eco CONSULTANTS

PRADEEP NV

Environmental Engineer

NISARGA ECO CONSULTANTS * BELAGAVI *

AUDIT PERIOD: 2023- 2024
(ACADEMIC YEAR)

ISO 9001:2015 CERTIFICATE NO. E20240510204
ISO 14001:2015 CERTIFICATE NO. E20240510205
ISO 17020:2012 CERTIFICATE NO. UQ-2024050701

* - Validity of this certificate is subject to successful periodic reviews

CERTIFICATE
ENERGY AUDIT

PRESENTED TO:

R V Institute of Management, Bengaluru

Our team of Environmental Engineers have analyzed Clean and Green Energy practices followed by the Institution*.

This certificate was awarded by:

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CERTIFICATE
ENVIRONMENT AUDIT

PRESENTED TO:

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Table of Contents

List of Tables

List of Graphs

Acknowledgement

We express our gratitude for calling upon us for this audit, mainly the R V institute of Management, Bengaluru, Director Dr. Purushottam Bung who was the driving force behind this work. Green Audit Committee members, Green Audit Committee and all the team members, who were ever helpful and supported us with all the inputs needed for this audit. We thank all the teaching, non-teaching and students for helping us in conducting this audit.

Our Audit Team

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About the Institute

RSST (Rashtreeya Sikshana Samithi Trust) to which RVIM belongs was established in 1940. It is recognized as RV Group of Institution (Rashtreeya Vidyalaya) is one of the fastest growing group of Institutions in the state of Karnataka. It has presence in virtually every field of academics and research. As on date, RV Group has under its ambit over 27 institutions, in which 20,000 plus students from all over India and abroad are pursuing their dream education, RV Engineering College, DAPM RV Dental College, RV School of Architecture, RV Aster Super Specialty Hospital, RV Teachers College, Bengaluru are some of the flagship Institutions under RV Group. We welcome you all to the world of RV Institute of Management, located in Jayanagar, the beautiful and central suburb of Silicon Valley of India, i.e. Bangalore also known as IT capital of India. The Institute is well connected to city even through metro rail network Our dedicated and experienced faculty with industry background; best in class infrastructure; student focus; intense placements support and robust industry and institutional linkages (domestic and international) help us in accomplishing our mission and vision. We believe in holistic development of students as reflected in our motto “We prepare our students for life”. In May 2019 RVIM was re-accredited by NAAC with ‘A+’ Grade & is certified by QS I-Gauge, a global accreditation agency for E-Readiness in 2020 and Diamond rating in the subject rating category in 2022.

Vision

- To become world class management Institute of eminence.

Mission

- To nurture universal thought leaders by offering holistic management education fostering business intelligence, health care, innovation, and entrepreneurship for inclusive growth and sustainable development.

Green, Energy, and Environment Audit: A Path to Sustainability

Understanding Green, Energy, and Environment Audit

Educational institutions play a crucial role in fostering sustainability by integrating responsible environmental practices into their operations. Conducting a Green, Energy, and Environment Audit enables campuses to assess their ecological footprint and implement measures for improvement. The process typically includes the following stages:

1. **Environmental Assessment** – This involves identifying key environmental factors within the campus, such as energy use, water consumption, waste generation, transportation, and eco-friendly material usage.
2. **Data Collection and Analysis** – Once these elements are identified, the audit measures their impact through utility bills, waste quantification, water meter readings, and emission assessments.
3. **Systematic Documentation** – The collected data is meticulously recorded, forming a baseline for current environmental performance and future comparisons.
4. **Comprehensive Reporting** – The findings are analyzed to highlight inefficiencies, recommend corrective measures, and propose cost-effective strategies.
5. **Actionable Recommendations** – Practical solutions such as energy-efficient technologies, waste reduction programs, sustainable transport options, and curriculum integration are suggested.
6. **Implementation and Continuous Monitoring** – Institutions must actively implement the proposed changes, involving all stakeholders and ensuring periodic assessments to track progress.

By conducting these audits, educational campuses not only minimize their environmental impact but also serve as role models for sustainable development.

Importance of Green, Energy, and Environment Auditing

Auditing campus sustainability initiatives provides valuable insights into resource utilization and environmental stewardship. Key benefits include:

1. **Resource Evaluation** – The audit examines how efficiently energy, water, and other resources are utilized within the institution.
2. **Encouraging Conservation** – By identifying wastage, institutions can implement conservation measures, such as adopting renewable energy sources and waste reduction strategies.
3. **Ongoing Monitoring** – Regular assessments help track improvements and ensure compliance with sustainability objectives.
4. **Addressing Environmental Challenges** – Institutions can take proactive steps to mitigate climate change effects and reduce resource depletion.
5. **Raising Environmental Awareness** – Engaging staff and students in sustainability initiatives fosters a culture of responsibility and eco-conscious behavior.

Goals of the Audit

A Green, Energy, and Environment Audit aims to:

- Identify the institution's environmental impact in terms of resource consumption and waste management.
- Ensure compliance with environmental regulations and best practices.
- Promote efficient use of resources by minimizing excessive or inefficient consumption.
- Reduce the institution's overall ecological footprint.
- Highlight cost-saving opportunities through improved efficiency and sustainability measures.
- Raise awareness about environmental responsibility among students and staff.
- Establish sustainability goals and monitor progress towards achieving them.
- Enhance overall environmental performance by implementing actionable strategies.

Key Objectives

- Assess current environmental practices and their impact.
- Identify and evaluate major sustainability challenges.
- Implement effective environmental management strategies across various departments.
- Continuously review and enhance performance in environmental sustainability.

Advantages of Conducting the Audit in Educational Institutions

1. **Cost Efficiency** – Identifying inefficiencies in resource use can significantly reduce utility expenses and operational costs.
2. **Environmental Impact Reduction** – By implementing sustainable measures, institutions can lower energy consumption, waste production, and carbon emissions.
3. **Sustainability Culture** – Encouraging students, faculty, and staff to participate in green initiatives promotes lifelong eco-friendly habits.
4. **Enhanced Institutional Reputation** – Demonstrating commitment to sustainability attracts environmentally conscious students, faculty, and donors, strengthening the institution's public image.

Executive Summary

A Green Campus integrates sustainable operations with environmental education, ensuring minimal ecological harm. A Green, Energy, and Environment Audit assesses an institution's adherence to sustainability practices, evaluates compliance with environmental regulations, and provides actionable recommendations for improvement.

Key focus areas include water quality, ventilation, vegetation, waste management, energy consumption, and environmental hazards such as radiation levels. Data is gathered through environmental sampling, stakeholder interactions, and field surveys. The findings are systematically analyzed and compiled into a comprehensive report, offering strategic recommendations for an effective environmental management plan.

Scope of the Audit

The audit evaluates the institution's commitment to sustainable practices across various departments and administrative functions. Key areas of focus include:

- Current environmental conditions on campus.
- Integration of sustainability education and awareness initiatives.
- Strategies for improving environmental standards.
- Benchmarks for institutional environmental protection programs.
- Efficient and sustainable resource utilization.

Using collected data, field observations, and inputs from institutional stakeholders, this report outlines specific recommendations to enhance sustainability within the campus.

Audit Findings

The audit findings indicate that students possess a general awareness of the importance of environmental protection. Additionally, the campus actively implements several sustainable practices, including water conservation, sewage treatment, waste management, cleanliness initiatives, waste segregation, and plantation drives.

However, a more in-depth analysis reveals that while the institution has adopted green practices at various levels and is appreciable.

Infrastructure and college details

- The college has sufficient infrastructure for curricular and co-curricular activities.
- Rooms - Classrooms, auditorium, library, department rooms, staffrooms, all labs, ladies' room etc.
- Sufficient reading materials for students.
- Administrative office, principal chamber, office room and department rooms are well located and ventilated.
- Underground and overhead water tanks.
- Computers: 200 desktops with internet facilities in office, principal chamber, department rooms and library with high-speed internet connectivity.
- The institution is in area of 0.7 acres and has a built-up area of 3766 sq. ft.
- Six number of classrooms and sufficient staff rooms in the institute.
- There are labs with all the facilities and are well ventilated.
- Institution has, seminar halls, conference halls, etc. with sufficient facilities.
- The campus has sports room, gym.
- Center for peace and yoga, Center for wellness is placed in the campus.
- Total number of students are 360, and 21 teaching staff.

1.

Green Cover Details

1. Green Cover

Plants and trees play a vital role in enhancing the environment of any educational institution. A well-maintained green cover not only adds to the aesthetic appeal of the campus but also fosters a healthy and conducive atmosphere for students. Regular plantation and maintenance of saplings are essential for sustaining this greenery.

Observations:

The campus boasts a diverse collection of plants and trees, contributing to rich biodiversity. The Green Club/Eco Club actively promotes a greener campus through various plantation drives and environmental awareness programs. Thoughtfully designed landscaping enhances the beauty of the college, reflecting a strong aesthetic and ecological vision.

A wide variety of trees, shrubs, herbs, ornamental plants, climbers, medicinal plants, and nursery plants are nurtured, helping to improve air quality and create a pollution-free environment. Lush lawns and shaded areas add to the serene ambiance of the campus. Dedicated gardeners and supervisors ensure the maintenance and development of green spaces, while the Construction, Maintenance, and Beautification Committee oversees their upkeep.

Despite the challenges posed by the rocky terrain, the institution has successfully cultivated a thriving green cover through persistent efforts by the management and staff. Indoor plants have been strategically placed along corridors, and provisions for creepers have been incorporated to further enhance the natural beauty of the campus.

1.1 Plantation drives are conducted every year

Institution conducts annual plantation drives in college. These drives have numerous environmental, social, and educational benefits. Here are some key aspects:

Objectives

Enhance Green Cover: Increase the number of trees on campus to improve air quality, provide shade, and enhance the aesthetic appeal.

Promote Biodiversity: Support local wildlife by planting native species that provide habitats and food sources.

Raise Environmental Awareness: Educate the college community about the importance of trees and encourage sustainable practices.

Combat Climate Change: Trees absorb carbon dioxide, helping to mitigate the effects of climate change.

Benefits

Environmental Impact, Educational Value, Community Building, Aesthetic Improvement, Health Benefits.

Table No. 1: Green Cover Details

Sl. No.	Scientific Name	Common Name
1.	*Azadirachta indica*	Silver Wood
2.	*Tectona grandis*	Teak
3.	*Callistemon viminalis*	Bottle Brush
4.	*Mangifera indica*	Mango Trees
5.	*Mimusops elengi*	Bullet Wood
6.	*Sesamum indicum*	Gingely Tree
7.	*Delonix regia*	Gulmohur Tree
8.	*Areca catechu*	Palm Tree


ABHYUDAYA

1.2 NSS/Eco-club/Green club team

An Eco-club or Green Club in college is a student-led group focused on promoting environmental awareness, sustainability, and eco-friendly practices within the campus and the broader community. The institution has made objectives, activities and projects for the same has been mentioned below:

Objectives

1. Environmental Awareness: Educate students and staff about environmental issues and the importance of sustainable living.

2. Sustainability Initiatives: Implement and promote eco-friendly practices on campus.

3. Community Engagement: Involve the college community in activities that support environmental protection and sustainability.

4. Advocacy and Policy: Advocate for environmentally responsible policies and practices at the college and local level.

Activities and Projects

1. Recycling Programs: Set up and manage recycling bins, organize recycling drives, and educate the community about proper waste segregation. E-waste collection drive and sending the same to the certified recycler has been channelized.

2. Energy Conservation: Promote energy-saving measures such as switching off lights, using energy-efficient appliances, and encouraging walking or cycling.

3. Green Campus Initiatives: Advocate for green building practices, installation of solar panels, and creation of green spaces like gardens.

4. Workshops and Seminars: Organize events on topics like sustainable living, climate change, and biodiversity conservation.

5. Clean-Up Drives: Conduct regular campus and community clean-up activities to remove litter and promote cleanliness.

6. Tree Planting: Organize tree-planting events to increase greenery and promote reforestation.

7. Sustainable Transportation: Promote the use of bicycles, public transport, and carpooling among students and staff.

8. Water Conservation: Initiate projects to reduce water waste, such as fixing leaks, promoting water-saving fixtures, and raising awareness about water conservation.

9. Eco-Friendly Products: Encourage the use of eco-friendly products like reusable water bottles, cloth bags, and biodegradable materials.

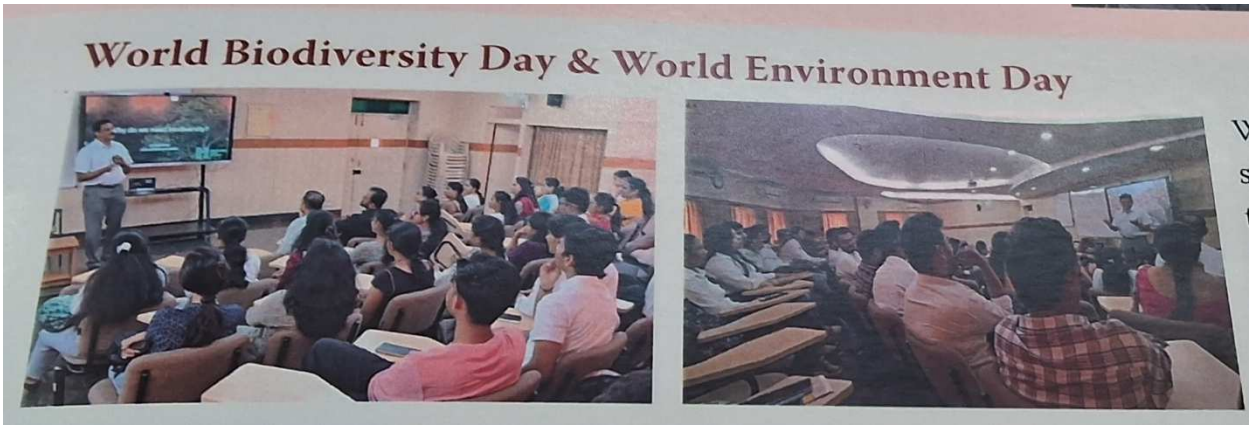
10. Collaboration with Other Organizations: Partner with local environmental groups, government agencies, and NGOs for larger environmental projects and campaigns.

Table No. 2: Eco-club/Green club team

Sl. No.	**Name**	**Designation**
1	Dr. Purushottam Bung	Professor & Director
2	Dr. Vinay S	Staff
3	Dr. Uma Sharma	Staff
4	Prof. Sowmya D S	Staff
5	Ms. Arpitha Bhat	Student Coordinator
6	Mr. Nikhil Jadav	Student Representative

World Environment Day (2023) was celebrated at campus

World Environment Day was celebrated in RVIM with a student photography contest on the topic of – 'From Agreement to Action – Building Back Biodiversity', and a workshop session on the topic of 'Why Do we need Biological Diversity' on 5th June 2023. The resource person for the session was Dr. Sanjay Gubbi – Program head – Holematti Nature Foundation. The photography contest was won by Dr. Purushottam Bung, Director RVIM and Prof. Anita B.M. D'Silva in the faculty category in the student category the prize was won by Adithya MS and Ranjith KL.



1.3 Biodiversity in the campus

Biodiversity encompasses the rich variety of life forms in the natural world, including plants, animals, insects, and microorganisms that coexist on our planet.

Observations:

The institute has ensured ample green cover across the campus, contributing to ecological balance and supporting biodiversity. Various bird species can be observed within the campus, creating a thriving natural habitat. Additionally, the presence of diverse flowering plants attracts bees, which play a crucial role in pollination, further enhancing the biodiversity of the campus. Aquariums have been installed on campus to enhance the environment and promote a sense of tranquility among students, staff, and visitors. The presence of aquatic life fosters a calming atmosphere, contributing to overall well-being and a positive learning environment.

*pictures in this page are for representation purpose only

1.4 Pedestrian friendly pathways

Pedestrian-friendly pathways in colleges are essential for ensuring a safe, accessible, and inclusive campus environment. With a large number of students, faculty, and staff commuting within the campus daily, well-designed walkways contribute significantly to mobility, safety, and sustainability.

Need for Pedestrian-Friendly Pathways:

1. **Safety and Accident Prevention** – Dedicated pathways reduce the risk of accidents by separating pedestrian movement from vehicular traffic. This is especially crucial in campuses with heavy footfall and vehicle movement.
2. **Accessibility for All** – Well-planned pathways, with ramps and signages, ensure that students with disabilities and mobility challenges can navigate the campus comfortably.
3. **Encouragement of Walking Culture** – A well-maintained pedestrian network promotes walking, reducing dependence on vehicles for short distances and supporting a healthier lifestyle.

Given the growing emphasis on sustainable infrastructure and student well-being, incorporating pedestrian-friendly pathways in degree colleges is a vital step towards creating a safer, healthier, and more accessible learning environment.

2.

Energy Management Details

2. Energy Management

Effective energy management is a crucial aspect of institutional sustainability. Reducing electricity consumption plays a significant role in minimizing greenhouse gas emissions. This can be achieved by utilizing energy-efficient 5-star rated electrical appliances. Additionally, harnessing renewable energy sources can further enhance sustainability efforts within the campus.

Observations:

- Solar rooftop harvesting has been implemented on campus, marking a significant step toward clean and sustainable energy.
- Extensive use of LED lighting has been adopted across the campus. The transition to LED tube lights and bulbs has been undertaken to enhance energy efficiency and reduce electricity consumption.
- Maximizing natural daylight is a key aspect of campus infrastructure. Classrooms, staff rooms, the library, and other spaces are strategically designed to harness ample natural light, minimizing the need for artificial lighting.
- Solar panels have been installed on the rooftop, generating renewable energy for use across the college campus. Any excess energy produced is stored in batteries for later use, ensuring optimal energy utilization. The details are provided in the table below.

Recommendations:

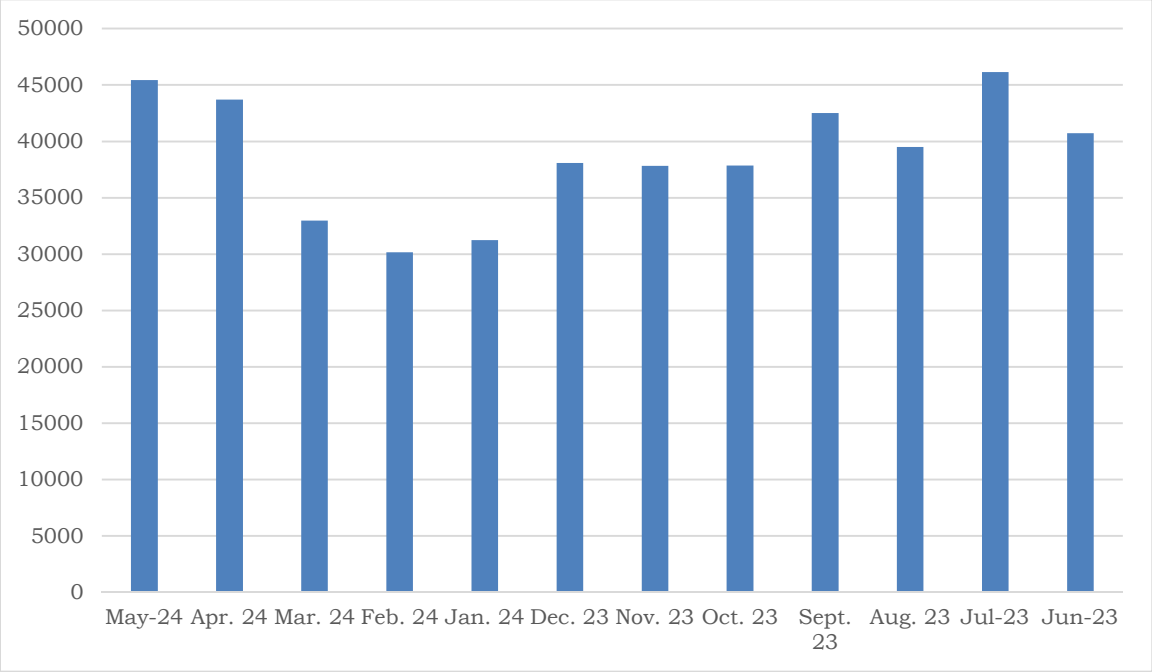
- Automated sensor lights can been installed in the campus for saving energy.
- EV vehicle charging stations can be installed for charging EV two wheelers and four wheelers.
- Best practices have already been implemented in the institution for optimum use of energy.

Table No. 3: Information regarding power supply and its management

Sl. No.	**Parameters**	**Response**
1.	Source of electricity	BESCOM and Solar panels
2.	Type of Solar system	Off grid
3.	No. of Solar Panels	20
4.	Capacity of solar panels	5 KW

2.1 Power Consumed by the institution

The college consumes energy in areas namely Air conditioners, Lighting, Fans, Blower and pumps in STPs, lift, computers, printers and so on. The college also has a captive DG set. UPS has been installed which resumes power backup within few seconds during power cuts. Solar photovoltaic is installed in the roof top.



Graph No. 1: Month wise electricity consumed in kWh

2.2 Power factor and Harmonics

Capacitors installed for the power factor correction is in line with the current demand, capacitors are connected to circuit at the output of the transformer. For the present load and demand sufficient capacitive compensation has been provided.

Following harmonics generating loads are connected to the system

1. Uninterruptible power supply units
2. LED Lights
3. Variable frequency drives of Lifts
4. Computers and related loads

The analysis of power factor and harmonics indicate that the institution has implemented adequate capacitive compensation. The Total Harmonics Distortion is less and is acceptable.

Details of other Electrical and Electronics appliances

Table No. 4: Details of other Electrical and Electronics appliances

Sl. No.	Appliance	Numbers	5 star rating
1	Computer (Desktops)	200	80% of the appliances have 5 star energy savings rating
2	Laptops	20	
3	Printers	20	
4	Copying machines	3	
5	Scanners	7	
6	Projectors	15	
7	Refrigerators	1	
8	AC	16	

2.3 Institutional Carbon Footprint Analysis

Institutional Carbon Footprint Analysis is a crucial step in understanding the environmental impact of an organization's activities. By measuring the total greenhouse gas emissions resulting from energy consumption, transportation, waste generation, and other operations, institutions can identify key contributors to carbon emissions. This analysis helps organizations adopt targeted strategies to reduce their environmental footprint, such as transitioning to renewable energy, improving energy efficiency, and promoting sustainable practices.

The impact of such efforts on the environment is profound. Reducing carbon emissions mitigates climate change, enhances air quality, and conserves natural resources. It also fosters environmental responsibility within the institution, inspiring students, staff, and stakeholders to adopt eco-friendly behaviors. Moreover, a reduced carbon footprint aligns institutions with global sustainability goals and enhances their reputation as environmentally conscious entities. By prioritizing Carbon Footprint Analysis, institutions play a pivotal role in creating a sustainable future.

2.3.1 Power Consumed by the institution and its Carbon foot print

A carbon footprint is the total amount of greenhouse gases (GHGs) emitted into the atmosphere as a result of human activities, either directly or indirectly. These emissions are usually measured in terms of carbon dioxide equivalents (CO_2 e), which accounts for the varying global warming potential of different gases like methane (CH_4) and nitrous oxide (N_2O).

Key Contributors to Carbon Footprint:

- Energy Use: Burning fossil fuels for electricity, heating, and transportation.
- Consumption: Production and disposal of goods, including food and clothing.
- Transportation: Emissions from vehicles, air travel, and public transport.
- Waste: Decomposition of organic waste in landfills, releasing methane.

Types of Carbon Footprints:

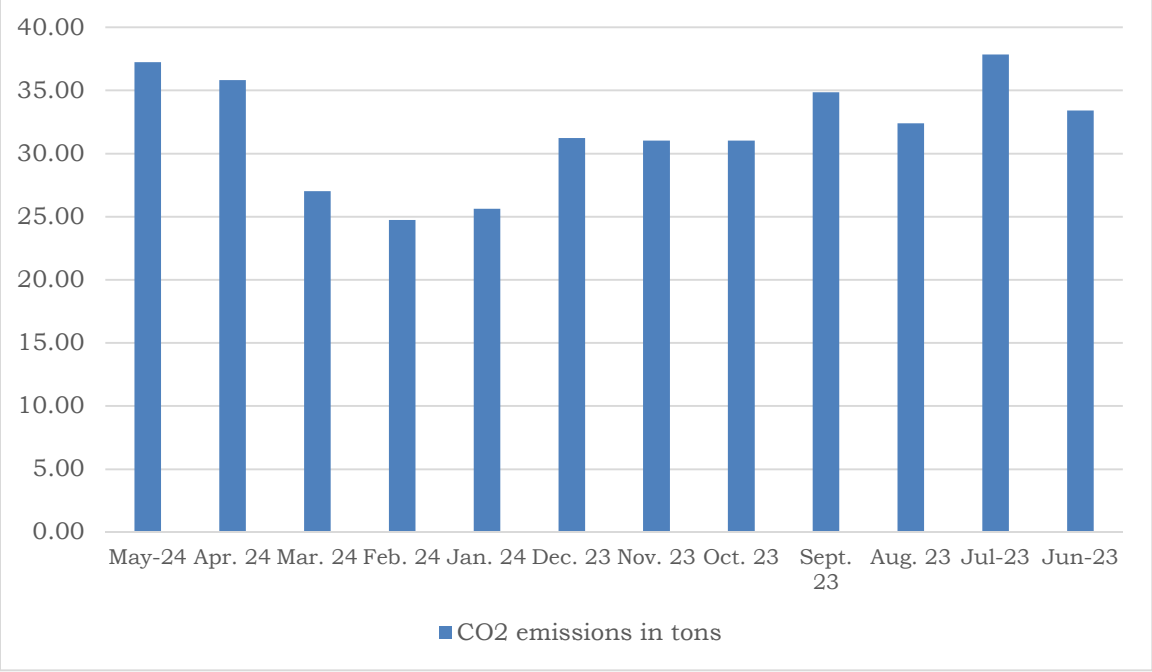
- Personal Carbon Footprint: Emissions caused by an individual's activities, such as driving, using appliances, or dietary choices.
- Organizational Carbon Footprint: Emissions resulting from a company or institution's operations.
- Product Carbon Footprint: Emissions associated with the lifecycle of a product, from raw material extraction to disposal.

Reducing a carbon footprint is essential for mitigating climate change by using renewable energy, improving efficiency, and adopting sustainable practices.

In this section we shall study the carbon dioxide released by the institute in terms of electricity consumed. 1 kWh of electricity consumed results in approximately 0.82* kg of CO_2 emissions. This value is based on the carbon intensity of electricity generation in India, which is largely dependent on coal-fired power plants.

Table No. 5: Monthly CO_2 Emissions from Electricity Usage

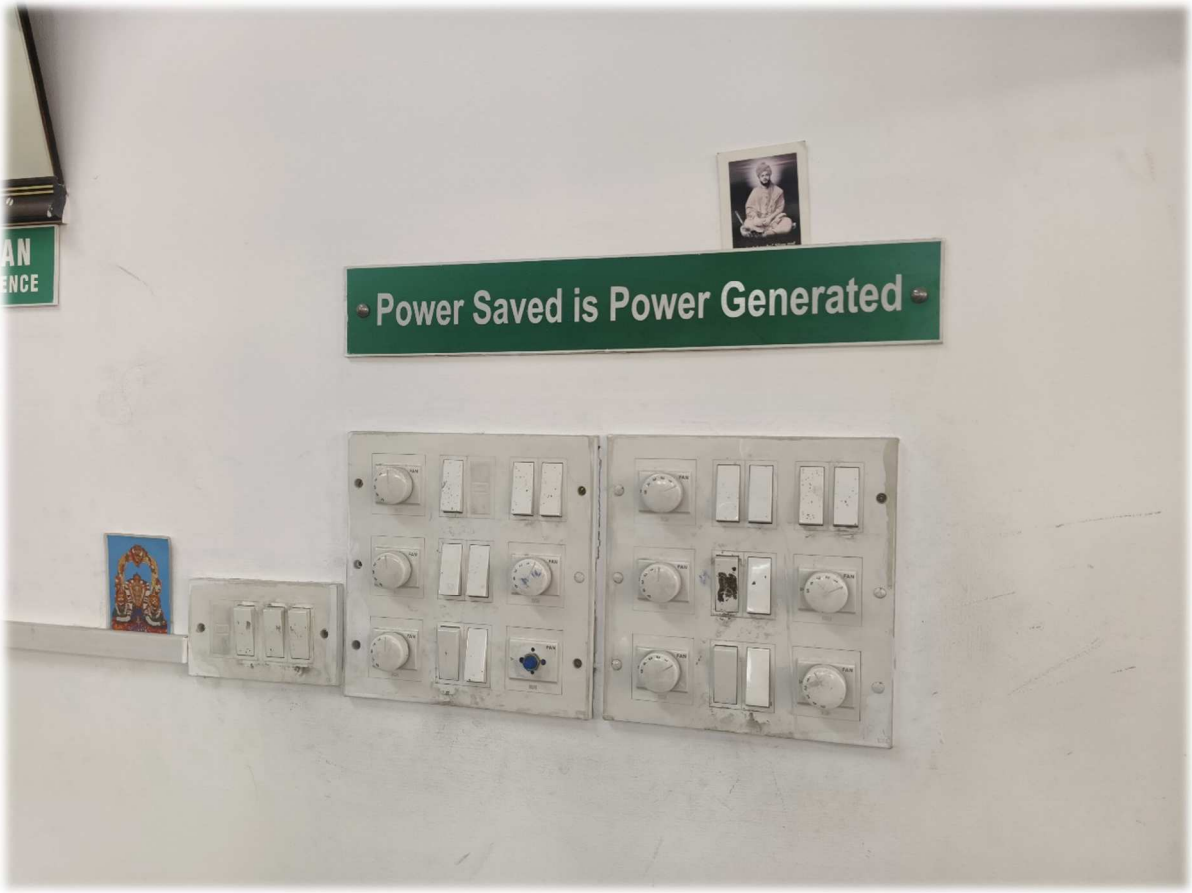
Sl. No.	Month	Units imported from HESCOM	CO_2 Emissions in tons
1	May 24	45430	37.25
2	Apr. 24	43693	35.83
3	Mar. 24	32965	27.03
4	Feb. 24	30171	24.74
5	Jan. 24	31252	25.63
6	Dec. 23	38098	31.24
7	Nov. 23	37831	31.02
8	Oct. 23	37845	31.03
9	Sept. 23	42509	34.86
10	Aug. 23	39505	32.39
11	Jul. 23	46153	37.85
12	Jun. 23	40737	33.40



Graph No. 2: Month wise CO_2 emissions in tons

Solar panels have been placed on the rooftop to convert solar energy into electrical energy

Diesel Generator (alternate source) during power cut



Energy saving awareness posters

3.

Environment Management Details

3. Environment Management

An Environmental Audit is a crucial assessment tool that helps educational institutions evaluate their environmental impact and implement sustainable practices. In India, educational institutions play a significant role in promoting environmental consciousness, and conducting systematic environmental audits ensures resource conservation, pollution control, and sustainable campus development. Environment Audit consists of the following:

A. Water Management

Water audits help institutions assess water consumption patterns, identify wastage, and implement conservation measures. This includes monitoring groundwater usage, evaluating water usage in hostels, laboratories, and gardens, and checking for leakages. Institutions can adopt rainwater harvesting, water-efficient fixtures, and wastewater recycling systems to reduce dependency on freshwater resources.

B. Waste Management

Proper waste management minimizes pollution and enhances sustainability. Institutions should implement waste segregation at source, ensuring that biodegradable and non-biodegradable waste are handled separately. Recycling initiatives, awareness programs, and waste reduction strategies like reducing plastic usage and promoting reusable materials contribute to a cleaner campus.

C. Vermicompost Units

Vermicomposting is an effective way to manage organic waste by converting food scraps, garden waste, and biodegradable materials into nutrient-rich compost using earthworms. Establishing vermicompost units in educational institutions promotes waste recycling, improves soil quality for gardening, and provides a hands-on learning opportunity for students on sustainable waste disposal.

D. Sewage Treatment Plant (STP)

STP ensures that wastewater generated from hostels, canteens, and restrooms is treated before being discharged. Proper sewage treatment prevents water pollution, protects nearby water bodies, and allows the reuse of treated water for gardening and flushing purposes. Institutions should ensure that their STPs meet regulatory standards to maintain environmental hygiene.

E. Light Intensity Audit

A light intensity audit evaluates illumination levels in classrooms, laboratories, and outdoor spaces to ensure adequate lighting while reducing energy consumption. By installing LED lights, motion sensors, and solar-powered lighting, institutions can enhance energy efficiency and reduce electricity bills. Ensuring optimal light intensity also improves productivity and learning environments.

F. Noise Level Monitoring

Excessive noise can negatively impact concentration and health. Monitoring noise levels in classrooms, auditoriums, and playgrounds helps maintain a conducive learning atmosphere. Measures such as soundproofing in auditoriums, restricting high-decibel activities, and promoting silent zones can significantly reduce noise pollution on campus.

G. Electromagnetic Radiation (EMR) Assessment

With increasing use of electronic devices, electromagnetic radiation (EMR) from Wi-Fi routers, mobile towers, and electrical appliances needs to be monitored. Institutions can conduct periodic EMR assessments to ensure exposure levels remain within safe limits. Proper placement of routers, limiting excessive gadget use, and creating EMR-free zones can help reduce potential health risks.

H. Air Pollution Monitoring

Educational institutions contribute to and are affected by air pollution from vehicle emissions, construction activities, and laboratory chemicals. Regular air quality monitoring helps assess levels of pollutants like PM 2.5, PM 10,

CO_2, and NOx. Strategies such as planting trees, restricting vehicle use on campus, and promoting cycling or walking can significantly improve air quality.

I. E – waste management

The increasing use of electronic devices in educational institutions leads to the generation of electronic waste (E-waste), including discarded computers, printers, mobile phones, and other digital equipment. Proper E-waste management is essential to prevent toxic substances like lead, mercury, and cadmium from harming the environment. Institutions should establish E-waste collection points, collaborate with authorized recyclers, and conduct awareness programs to educate students and staff about responsible disposal and recycling of electronic waste. Encouraging the reuse and refurbishment of electronic items can further minimize waste generation.

3.1 Water management

The quality and quantity of water are crucial aspects of a Green Campus. These factors vary depending on the condition of the water source. The presence of contaminants can pose health risks to consumers, making regular water quality monitoring essential for the well-being of campus occupants. Additionally, an effective water management plan is vital to ensure the sustainable utilization of this valuable resource.

Observation:

- The campus primarily relies on a borewell and the BWSSB water supply, ensuring an adequate water supply throughout the year. Water from the borewell and underground storage tanks is pumped to an overhead tank on the top floor before distribution. Drinking water from the filter-cum-cooler is tested for TDS, temperature, and pH. Additionally, rainwater harvesting has been implemented, with the collected water stored in two underground tanks.
- R V institute of Management has a very well planned rainwater harvesting system.

Rainwater storage tank

Table No. 6: Information regarding source of water and its usage points

Sl. No.	Parameter	Response
1.	Source of water for campus	Borewell and Rain Water
2.	No. of open Wells/Bore wells	Two Bore wells
3.	Capacity of underground water tank	50,000 liters
4.	Number of water tanks (Overhead tank)	4
5.	Capacity of water tank (Overhead tank)	90,000 liters
6.	Quantity of water pumped every day	80,000 liters
7.	Waste water sources	Canteen and Washroom
8.	Use of waste water	Gardening and Flushing
9.	No. of drinking water filters/water coolers	3
10.	Rain water harvest available?	Yes
11.	No. of units and amount of Rain water harvested	100,000 liters
12.	Any water saving techniques followed?	Dual-flush systems, and leak detection maintenance are followed.
13.	Are there any signs/posters reminding peoples to turn off the water?	Signs and posters are placed in washrooms and common areas, reminding people to turn off taps after use.
14.	Drinking water testing	Regularly Tested

Table No. 7: The table presents the test results for Total Dissolved Solids (TDS) and pH levels of the drinking water

Source	Inlet			Outlet		
	TDS (ppm)	pH	Temperature (°C)	TDS (ppm)	pH	Temperature (°C)
Water filter 1	155	7.5	28	45	7.3	24
Water filter 2	150	7.5	27	50	7.3	23
Water filter 3	160	7.5	28	50	7.3	24

Water filter and cooler tanks have been placed in every floor

Overhead tanks

Water storage tank

Fire extinguishers have been placed at every floor

Save water awareness posters have been put near taps, wash rooms. SDG 6 has been put up.

3.2 Waste Management:

Effective waste management in educational institutions is crucial for maintaining a clean and sustainable campus environment. Institutions generate a significant amount of waste, including biodegradable and non-biodegradable materials. Proper segregation, disposal, and recycling practices can help minimize environmental impact.

Types of Waste

1. Biodegradable Waste
    - Includes food waste, garden waste (leaves, branches), paper waste, and other organic materials.
    - Can be managed through composting, biogas plants, or vermicomposting to create useful organic manure.
2. Non-Biodegradable Waste
    - Includes plastics, glass, metals, e-waste, and other synthetic materials.
    - Needs proper segregation for recycling, reusing, or safe disposal to prevent environmental pollution.

Waste Management Strategies

1. Segregation at Source
    - Providing separate bins for biodegradable and non-biodegradable waste.
    - Encouraging students and staff to follow waste segregation guidelines.
2. Composting and Vermicomposting
    - Setting up composting pits to manage food and garden waste.
    - Utilizing vermicomposting units to convert organic waste into nutrient-rich compost.
3. Plastic-Free Campus Initiatives
    - Reducing the use of single-use plastics by promoting eco-friendly alternatives.

- Encouraging the use of reusable bottles, bags, and cutlery.

4. Recycling and E-Waste Management
   - Collaborating with recycling agencies to process paper, plastic, and metal waste.
   - Establishing e-waste collection points for safe disposal of electronic waste.
5. Awareness and Participation
   - Organizing workshops, seminars, and campaigns on waste reduction and management.
   - Involving students in eco-clubs and sustainability initiatives.
6. Green Audits and Policy Implementation
   - Conducting periodic green audits to assess waste management efficiency.
   - Implementing strict policies on waste disposal and sustainable practices.

By adopting these strategies, educational institutions can significantly reduce their environmental footprint and serve as role models for sustainable waste management practices.

Observations:

In this campus, the waste generated is managed as mentioned below:

- Bio-degradable waste (sewage) from toilets is connected to Sewage Treatment Plant.
- Paper waste is sent to ITC for recycling. RVIM has signed a MOU with ITC. Wellbeing out of waste is the main motto of the duo.
- The institution has taken significant steps towards becoming a paper-free campus, with the adoption of SAP for human resource management.
- Digital displays are utilized for disseminating posters and notices, reducing paper usage.
- Course materials have been digitized and made accessible to students.

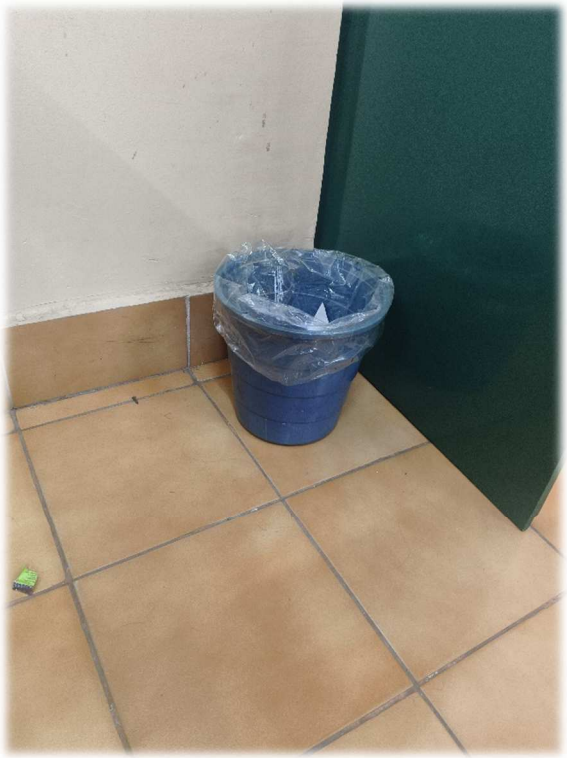
- Reusable glass and steel plates are used on campus to minimize single-use plastics.
- The campus has been designated as a 'Single-Use Plastic-Free Zone,' with any plastic waste generated being collected by the BBMP waste collection service.
- Educational posters on water conservation, waste minimization, and waste segregation have been strategically placed across the campus to enhance awareness.
- Awareness posters highlighting the adverse effects of plastic are also displayed to promote environmental consciousness.

Awareness posters regarding 'No Plastics' and 'Keep campus clean'

Awareness posters regarding segregation of waste an initiative by ITC WOW

Sanitary pad vending and incinerator have been placed in ladies room

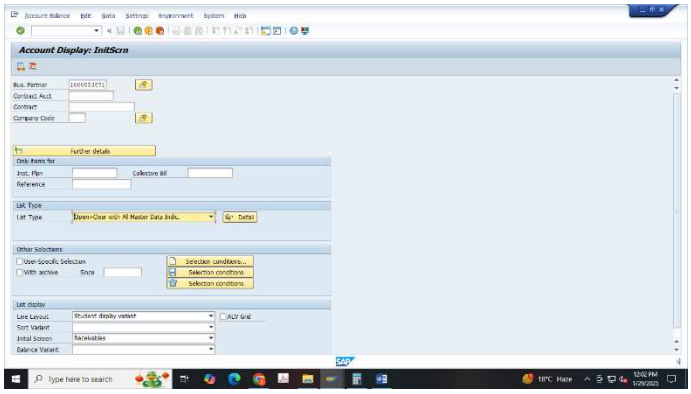
Reusable stainless steel glasses and plates are used in the campus



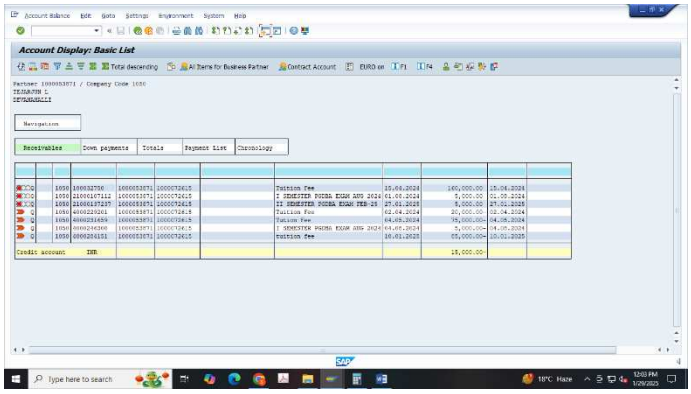
Dustbins are placed in corridors, classrooms, and open areas

SAP (Systems, Applications, and Products in Data Processing) is implemented in R V Institute of Management to digitize administrative and academic processes, significantly reducing the reliance on physical books and registers. By transitioning to a digital ecosystem, SAP optimizes resource management, enhances operational efficiency, and promotes sustainability in the following ways:

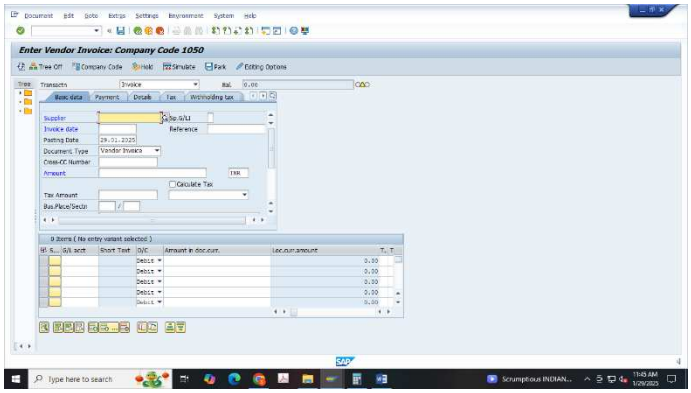
1. Reduction in Paper Consumption: Digital record-keeping eliminates the need for printed registers, student files, and administrative paperwork, thereby conserving natural resources and minimizing deforestation associated with paper production.
2. Energy and Resource Conservation: By integrating cloud-based solutions and digital storage, SAP reduces the need for physical infrastructure such as filing cabinets and storage rooms. This minimizes energy consumption associated with document handling, printing, and storage.
3. Carbon Footprint Reduction: Moving towards a paperless environment significantly cuts down transportation-related emissions involved in procurement, distribution, and disposal of paper-based materials.
4. Sustainability and Green Campus Initiatives: The adoption of SAP aligns with institutional sustainability goals by promoting digital governance, reducing waste generation, and fostering an eco-friendly learning environment.



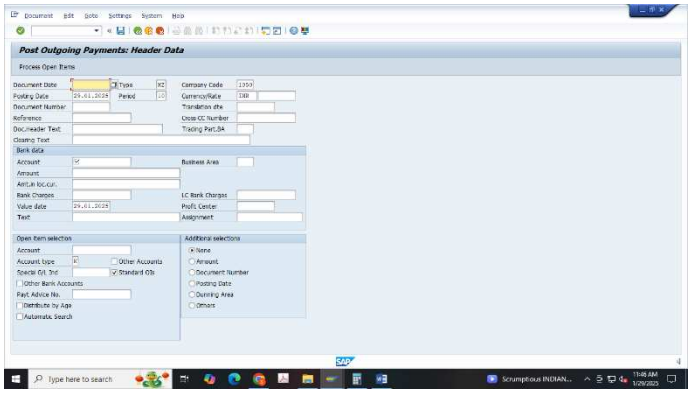
Student ledger view



Display of student data



Invoice entry



Payment entry

The above screenshots illustrate the implementation of SAP for maintaining various institutional records.

3.2.1 Sewage Treatment Plant

Waste water from bathrooms, urinals, toilets, kitchen generally termed as sewage can be treated and be reused. Treated sewage can be used for gardening, flushing and so on. This helps in minimizing the use of fresh water for flushing and gardening.

Observations:

Institution has a STP (Sewage Treatment Plants). Treated sewage is used for gardening, thus reducing load on fresh water.

Table No. 8: Information on source and fate of wastewater

Sl. No.	Details	Remarks
1	Wastewater Source	Washrooms and canteen
2	Use of waste water	STP
3	Fate of waste water from labs	NA
4	Weather waste water from labs is mixed with other wastewater sources	NA
5	Any treatment for lab waste?	NA
6	Disposal of wastewater	STP
7	Use of treated wastewater from STP	Gardening and flushing
8	Sludge treatment	Drying
9	Use of sludge	Used as manure

Sewage treatment plant installed in the campus

3.3 Air Quality

Air quality plays a crucial role in daily life, especially as people spend a significant amount of time indoors. Indoor air quality refers to the condition of the air within and around buildings and structures, directly impacting the health, comfort, and well-being of occupants. Poor indoor air quality has been associated with sick building syndrome, decreased productivity, and hindered learning in educational institutions.

Observations

Particulate matter levels were measured in classrooms, staff rooms, and the library. It was found that the concentrations of PM 1, PM 2.5, and PM 10 were negligible at the time of measurement. The recorded readings reflect measurements taken at that specific moment.

Table No. 9: Readings of PM1, PM 2.5, PM 10, HOCH and TVOC

Sl. No.	Room				HCOH	TVOC
		PM 1	PM 2.5	PM 10		
1.	Director's Room	6	15	22	<0.1 ppm	0.3 mg/m^3 to 0.5 mg/m^3
2.	Pantry	9	14	20		
3.	Secretary to Director	7	15	22		
4.	Board Room	8	14	23		
5.	Stationary stores	9	13	24		
6.	Dept. of IT and Management Centre for Social Responsibility	9	13	25		
7.	Digital Library	9	12	24		

8.	Centre for Media	10	12	23		
9.	Conference Hall	9	15	23		
10.	Dept. of Finance	8	14	24		
11.	Administrative office	8	12	22		
12.	Dept. of General Management	9	11	20		
13.	Dept. of Human Resources	10	12	19		
14.	Lecture Hall/Classroom	9	15	18		
15.	Lecture Hall/Classroom	8	16	17		
16.	Lecture Hall/Classroom	9	14	20		
17.	Students discussion/Reading room	9	14	22		
18.	First Aid cum Sick room and medical Counselling Centre	8	13	25	<0.1 ppm	0.3 mg/m^3 to 0.5 mg/m^3
19.	MDP/FDP hall/Tutorial room	7	11	24		
20.	Centre for Wellness	11	16	25		
21.	Computer Lab (1)	10	14	24		
22.	Computer Lab (2)	7	11	21		
23.	Communication Lab	8	10	22		
24.	System Service Centre	5	12	24		
25.	Centre for Knowledge Resources	9	15	26		
26.	RVIM Centre for Innovation, Entrepreneurship & Incubation	10	14	25		
27.	Activity room/Workshop Hall	7	13	23		

28.	IBM Innovation Centre for Education	9	15	25	<0.1 ppm	0.3 mg/m^3 to 0.5 mg/m^3
29.	Girls common room	10	16	19		
30.	Seminar Hall	9	14	18		
31.	Seminar Hall	8	15	17		
32.	Dept. of Marketing	7	16	20		
33.	IQAC/RV Centre for Research and Consultancy	7	14	21		
34.	Examination Control Room	8	13	22		
35.	Lecture hall/Classroom	9	12	24		
36.	Lecture hall/Classroom	9	12	23		
37.	Lecture hall/Classroom	6	15	20		
38.	Lecture hall/Classroom	5	9	22		
39.	Centre for training and placement Centre for Alumni Relations Counselling Centre Anti-ragging cell	8	11	21		

3.4 Light

The Role of Lighting in Learning Spaces

Visual engagement is a fundamental aspect of the learning process, making proper classroom lighting essential. Classrooms accommodate various activities, including reading, writing, presentations, and assessments, all of which require adequate illumination. Well-lit learning environments are crucial in higher education institutions to support effective learning.

Student workspaces should maintain a minimum light level of 200 lux, with specific areas requiring specialized lighting. As per IS 3646 standards, an average illumination of 200–300 lux is recommended for teaching spaces, offices, and meeting rooms. Additionally, areas in front of the board should feature dedicated and separately controlled lighting to enhance visibility during presentations.

Observations:

Observations revealed that all classrooms are well-lit, with light intensity ranging between 300 lux and 450 lux.

Natural daylight serves as the primary source of illumination in classrooms, staff rooms, the library, and other areas. The infrastructure is thoughtfully designed to maximize natural light utilization across the campus.

LED bulbs have been widely installed, and a transition to LED tube lights and bulbs has been undertaken to enhance energy efficiency.

The recorded readings reflect measurements taken at that specific moment.

Table No. 10: Readings of Light intensity in lux

Sl. No.	Room	Light intensity in lux
1.	Director's Room	350
2.	Pantry	301
3.	Secretary to Director	328
4.	Board Room	302

5.	Stationary stores	318
6.	Dept. of IT and Management Centre for Social Responsibility	339
7.	Digital Library	307
8.	Centre for Media	350
9.	Conference Hall	301
10.	Dept. of Finance	315
11.	Administrative office	334
12.	Dept. of General Management	395
13.	Dept. of Human Resources	385
14.	Lecture Hall/Classroom	320
15.	Lecture Hall/Classroom	319
16.	Lecture Hall/Classroom	339
17.	Students discussion/Reading room	307
18.	First Aid cum Sick room and medical Counselling Centre	338
19.	MDP/FDP hall/Tutorial room	338
20.	Centre for Wellness	314
21.	Computer Lab (1)	302
22.	Computer Lab (2)	318
23.	Communication Lab	319
24.	System Service Centre	316
25.	Centre for Knowledge Resources	317
26.	RVIM Centre for Innovation, Entrepreneurship & Incubation	328
27.	Activity room/Workshop Hall	314
28.	IBM Innovation Centre for Education	302

29.	Girls common room	318
30.	Seminar Hall	326
31.	Seminar Hall	336
32.	Dept. of Marketing	310
33.	IQAC/RV Centre for Research and Consultancy	340
34.	Examination Control Room	331
35.	Lecture hall/Classroom	343
36.	Lecture hall/Classroom	349
37.	Lecture hall/Classroom	315
38.	Lecture hall/Classroom	350
39.	Centre for training and placement Centre for Alumni Relations Counselling Centre Anti-ragging cell	335

3.5 Noise

Noise and Classroom Environment

Noise is an unwanted sound that can be distracting, unpleasant, or disruptive to the learning environment. In classrooms, maintaining low noise levels is crucial, as excessive noise can interfere with students' concentration and overall academic performance. Ideally, an unoccupied classroom should have low noise levels to create an optimal learning atmosphere.

Observations:

Measurements taken in classrooms showed noise levels ranging from 30 dB to 68 dB, depending on occupancy. Unoccupied classrooms generally maintained low noise levels, while classrooms with students exhibited higher readings due to various activities. The readings mentioned are measured at that instant.

Table No. 11: Readings of Noise levels in decibel

Sl. No.	Room	Noise in decibel	
		Minimum	Maximum
1.	Director's Room	44	68
2.	Pantry	39	57
3.	Secretary to Director	43	62
4.	Board Room	43	63
5.	Stationary stores	30	57
6.	Dept. of IT and Management Centre for Social Responsibility	42	55
7.	Digital Library	37	57
8.	Centre for Media	47	67
9.	Conference Hall	50	55
10.	Dept. of Finance	30	64
11.	Administrative office	43	65

12.	Dept. of General Management	35	61
13.	Dept. of Human Resources	38	62
14.	Lecture Hall/Classroom	43	58
15.	Lecture Hall/Classroom	37	65
16.	Lecture Hall/Classroom	39	56
17.	Students discussion/Reading room	40	56
18.	First Aid cum Sick room and medical Counselling Centre	37	57
19.	MDP/FDP hall/Tutorial room	47	67
20.	Centre for Wellness	50	55
21.	Computer Lab (1)	30	64
22.	Computer Lab (2)	43	65
23.	Communication Lab	35	61
24.	System Service Centre	38	62
25.	Centre for Knowledge Resources	43	58
26.	RVIM Centre for Innovation, Entrepreneurship & Incubation	34	64
27.	Activity room/Workshop Hall	41	56
28.	IBM Innovation Centre for Education	33	59
29.	Girls common room	42	59
30.	Seminar Hall	34	60
31.	Seminar Hall	30	64
32.	Dept. of Marketing	37	66
33.	IQAC/RV Centre for Research and Consultancy	38	67
34.	Examination Control Room	40	66
35.	Lecture hall/Classroom	36	64

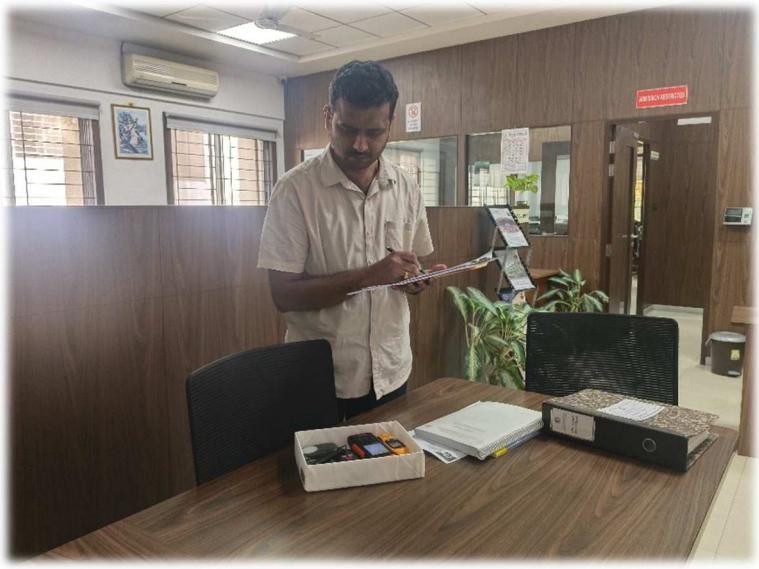
36.	Lecture hall/Classroom	45	55
37.	Lecture hall/Classroom	31	57
38.	Lecture hall/Classroom	42	54
39.	Centre for training and placement Centre for Alumni Relations Counselling Centre Anti-ragging cell	31	45

3.6 Electro Magnetic Radiations

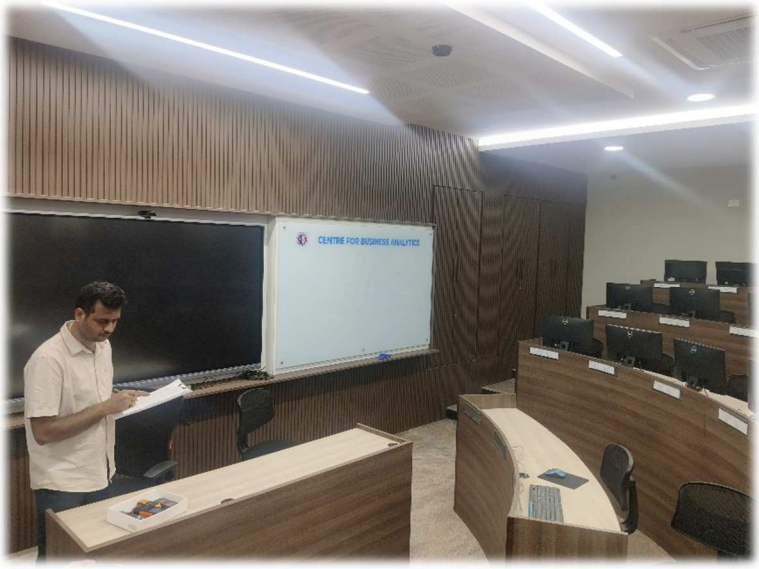
Electromagnetic radiation (EMR) refers to waves of the electromagnetic (EM) field that travel through space, carrying electromagnetic energy. EMR is produced by electronic devices, and prolonged exposure to these radiations should be avoided.

Observations

Measurements of electromagnetic radiation were conducted in all classrooms, staff rooms, and the library. It was found that the electromagnetic radiation levels were zero in these areas. Both H-Field and E-Field were detected in the server room, but this room is isolated and remains closed at all times.



Assessment of Particulate Matter (PM1, PM2.5, PM10), Light Intensity, Noise Levels, Electromagnetic Radiation (EMR), Formaldehyde (HCOH), and Total Volatile Organic Compounds (TVOC).



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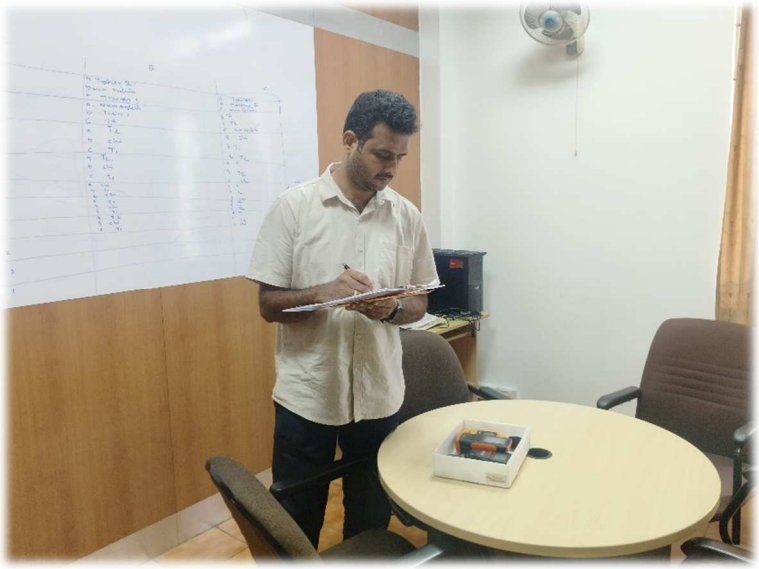

Assessment of Particulate Matter (PM1, PM2.5, PM10), *Light Intensity*, *Noise Levels*, *Electromagnetic* Radiation (EMR), Formaldehyde (HCOH), and Total Volatile Organic Compounds (TVOC).

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Assessment of Particulate Matter (PM1, PM2.5, PM10), Light Intensity, Noise Levels, Electromagnetic Radiation (EMR), Formaldehyde (HCOH), and Total Volatile Organic Compounds (TVOC).

DISCLAIMER

The audit team has prepared this report for R V institute of Management, Bengaluru based on the input data provided by the R V Institute of Management representatives, supplemented by the expert team's best judgment.

The carbon footprint calculations provided in this report are based on standard data and values obtained from various research papers and articles. These calculations are intended to provide an understanding of carbon emissions and should be considered as indicative estimates rather than precise measurements. They may not reflect absolute accuracy due to variability in emission factors and contextual differences.

While every effort has been made to ensure accuracy, the details in this report have been compiled in good faith based on the information gathered. The recommendations are made using our best judgment; however, no representation, warranty, or undertaking, express or implied, is made. The audit team accepts no responsibility for any direct or consequential loss arising from the use of the information, statements, or forecasts in this report.

For NISARGA ECO CONSULTANTS

PROPRIETOR

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