

GREEN, ENERGY AND ENVIRONMENT AUDIT REPORT



Global Institute of Management Sciences
(Growing and Inspiring Minds for Success)
RR Nagar Bangalore

Audit Conducted and Submitted by



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ABOUT THE COLLEGE

Global Institute of Management Sciences (GIMS), an initiative of D.K.S. Charitable Institute (R), is committed to providing high-quality education accessible to all, guided by the motto, "Quality education for all at all levels." Located amidst the picturesque and pollution-free surroundings of Rajarajeshwari Nagar in southeastern Bangalore, the campus offers a tranquil environment ideal for academic pursuits.

GIMS is affiliated with Bangalore University, accredited by the National Assessment and Accreditation Council (NAAC), approved by the All India Council for Technical Education (AICTE), New Delhi, and recognized under Section 2(f) of the UGC Act, 1956. The institution prides itself on a pedagogy that blends innovative teaching methods with participatory self-reflection, emphasizing sustained growth by integrating assertiveness with core values.

The college offers diverse programs including postgraduate degrees such as Master of Computer Applications (MCA) and Master of Business Administration (MBA), as well as undergraduate degrees in Bachelor of Computer Applications (BCA), Bachelor of Business Administration (BBA), and Bachelor of Commerce (B.Com). The institute fosters holistic development through various extracurricular clubs and committees, promoting creativity, social engagement, and personal growth.

College is committed to academic excellence, social responsibility, and ethical leadership, GIMS nurtures students to become responsible, inspired leaders prepared for the challenges of a rapidly evolving world.



GREEN AUDIT

GREEN AUDIT

A Green Audit is a thorough assessment of an organization's environmental policies and practices, aimed at identifying its ecological impact and uncovering opportunities for improving resource efficiency and sustainability. Environmental management entails a systematic evaluation of operational policies, practices, and procedures both within and outside the organization's physical premises to assess their environmental consequences.

This audit, often referred to as an environmental impact assessment or sustainability assessment, includes a detailed examination process that outlines steps for identifying, measuring, evaluating, and reporting significant environmental factors. The primary objective is to foster an eco-friendly environment and minimize adverse environmental effects.

Significance of Green Audits

Green Audits are particularly vital on educational institutions, as they promote sustainable practices and help reduce carbon footprints. By aligning their operations with sustainable development principles, educational institutions can make a meaningful contribution to environmental conservation efforts through the analysis and implementation of optimal environmental practices.

Objectives of Green Audit

Green audits has become increasingly vital for organizations, as it serves as a concrete indication of their dedication to addressing contemporary environmental challenges. It also validates if the organization has consistently prioritized maintaining a clean environment. Therefore, the current green audit aims to assess, quantify, clarify, and rank an environmental sustainability framework based on relevant policies, regulations, and benchmarks.

The primary objectives of a Green Audit include:

- Enhancing stakeholder awareness regarding the significance of environmental conservation and the impacts of degradation in line with the organization's environmental management systems and legislation.
- Ensuring future sustainability by providing stakeholders with essential data about the campus's environmental sustainability status.
- Promoting environmental sustainability by establishing connections between flora, fauna, and audit sites to protect a healthy environment for the institution's stakeholders.
- Complying with policies such as the 'Water Conservation Policy,' 'Waste Management Policy,' and 'Green Campus and Environment Policy' to effectively reduce resource consumption.

The specific aims of a green audit are as follows:

- Assessing compliance with relevant laws, regulations, and obligations.
- Establishing performance benchmarks for planning and developing the environmental management system.
- Encouraging the adoption and use of effective methods for environmental management.
- Ensuring transparency and credibility in environmental initiatives is of paramount importance.
- Protecting the environment and minimizing risks to human health.

CARBON SEQUESTRATION

Understanding Carbon Sequestration in College Environments

Carbon sequestration refers to the long-term storage of carbon in various reservoirs, including soils, plants, oceans, and geological formations. This essential process helps mitigate one of the major contributors to climate change: the buildup of carbon dioxide (CO₂) in the atmosphere. Carbon sequestration can be enhanced by human activities or can occur naturally through biological processes like photosynthesis and decomposition.

The Push for Expedited Carbon Sequestration

Recently, there has been a growing interest in accelerating carbon sequestration to combat climate change. This curiosity has led to research and innovations in land use, forestry practices, and groundbreaking geoengineering methods, such as carbon capture and storage (CCS).

The Role of Trees and Plants on College Campuses

In the context of college environments, trees and landscaping play a significant role in carbon sequestration. Trees act as natural carbon sinks due to their ability to store carbon in their biomass, soil, and roots, while also absorbing CO₂ during photosynthesis. Many campuses feature lush green spaces filled with diverse tree species, presenting a valuable opportunity for carbon capture. On a smaller scale, potted plants although do not significantly contribute to carbon sequestration within college settings, however by absorbing CO₂ and producing oxygen through photosynthesis, indoor plants help lower CO₂ levels in enclosed spaces, thereby improving air quality and making a small yet meaningful impact.

Enhancing Carbon Sequestration Through Strategic Practices

College campuses can strengthen their carbon sequestration efforts by adopting strategic landscaping practices. Maintaining green spaces, planting indigenous tree species, and creating green walls and roofs can all enhance carbon storage on campus. Implementing such sustainable landscaping practices in college campuses can aid in addressing climate change and fostering environmental stewardship within communities.

SL. NO.	SCIENTIFIC NAME	COMMON NAME	NUMBER OF TREES
1	Terminalia catappa	Indian Almond	3
2	Pongamia pinnata	Indian beech	3
3	Peltophorum pterocarpum	Copper Pod	2
4	Tabebuia	Rosy Trumpet Tree	1
5	Samania saman	Rain Tree	1
6	Markhamia lutea	Nile Tulip	1
7	Ficus religiosa	Sacred Fig	4
8	Cocos nucifera	Coconut tree	1
9	Pithecellobium dulce	Manila Tamarind	1



1.Indian almond/*Terminalia catappa*

Terminalia catappa is a large tropical tree in the leadwood tree family, Combretaceae, native to Asia, Australia, the Pacific and Madagascar. Common names in English include country almond, Indian almond, Malabar almond, sea almond, tropical almond, beach almond and false kamani.



2.Pongam/*Millettia pinnata*

Millettia pinnata is a species of tree in the pea family, Fabaceae, native to eastern and tropical Asia, Australia, and Pacific islands. It is often known by the synonym *Pongamia pinnata*. Its common names include Indian beech and Pongame oiltree.



3. *Peltophorum Pterocarpum*/Copper pod

Flowers are bright yellow and grow in clusters on upright stalks. Flowers have orange stamens and, each flower has crinkled petals with a reddish brown mark in the centre. Seed pods are flat, thin and winged.



4. *Tabebuia*/Rosy Trumpet Tree

The tree crown is wide, with irregular, stratified ramification and only few thick branches. The bark can be gray to brown, in varying darkness and may be vertically fissured. Leaves are compound, digitate and deciduous. Each leaf has five leaflets of variable size, the middle one being the largest



5. *Samanea saman*/Rain tree

Samanea saman, also known as Rain Tree, is a tree, up 30 m tall. It is widely cultivated in Southeast Asia, especially Singapore, for its iconic umbrella-shaped crown which provides plenty of shade.



6. *Markhamia lutea*/Nile tulip

Markhamia lutea, the Nile tulip, Nile trumpet or siala tree is a tree species of the family Bignoniaceae, native to eastern Africa and cultivated for its large bright yellow flowers. It is related to the African tulip tree.



7.Ficus religiosa/Sacred fig

Ficus religiosa or sacred fig is a species of fig native to the Indian subcontinent, and Indochina. It belongs to the Moraceae, the fig or mulberry family. It is also known as the bodhi tree, pippala tree, peepul tree, peepal tree or ashwattha tree.



8.Cocos nucifera/Coconut tree

The coconut tree is a member of the palm tree family, Arecaceae and the only living species of the genus *Cocos*. The term "coconut" can refer to the whole coconut palm, the seed, or the fruit, which botanically is a drupe, not a nut. The name comes from the old Portuguese word coco, meaning "head" or "skull", after the three indentations on the coconut shell that resemble facial features. They are ubiquitous in coastal tropical regions and are a cultural icon of the tropics.



9. *Pithecellobium dulce*/Manila Tamarind

Manila tamarind is a fast growing tree that may reach a height of 10 m in 5-6 years in favourable conditions. Manila tamarind has a short, stout, greyish trunk that bears low irregular branches and forms a broad crown.

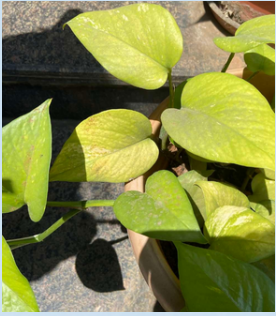
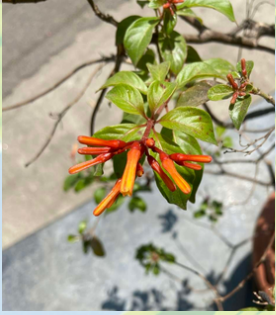


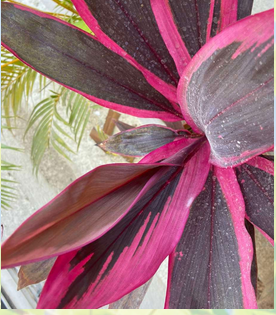
POTTED PLANTS

Sl.No.	Scientific Name	Common Name	No. of Plants	Image
1	<i>Pinophyta</i>	Conifers	7	
2	<i>Acalyphy wilkesiana</i>	Copperleaf	4	
3	<i>Hibiscus rosa sinensis</i>	Chinese Hibiscus	7	
4	<i>Aglonema</i>	Chinese Evergreen	5	
5	<i>Asparagus setaceus</i>	Asparagus Fern	11	

Sl.No.	Scientfic Name	Common Name	No. of Plants	Image
6	<i>Curio ficoides</i>	Blue Chalkstick	1	
7	<i>Chorophytum comosum</i>	Spider Plant	6	
8	<i>Tradescantia spathacea</i>	Oyster Plant	1	
9	<i>Rosa rubiginosa</i>	Sweet Briar	7	
10	<i>Pseuderanthemum</i>	Yellow-Veined Eranthemum	4	

Sl. No.	Scientific Name	Common Name	No. of Plants	Image
11	<i>Dracaena reflexa</i>	Song of India	3	
12	<i>Dracaena fragrans</i>	Corn Plant	2	
13	<i>Pandanus veitchii</i>	Veitch's Screw-Pine	4	
14	<i>Polyscias fruticosa</i>	Aralia Golden	1	
15	<i>Aglaonema costatum</i>	Aglaonema Snow White	9	

Sl. No.	Scientific Name	Common Name	No. of Plants	Image
16	<i>Epiprenum aureum</i>	Golden Pothos	2	
17	<i>Schefflera heptaphylla</i>	Ivy Tree	1	
18	<i>Durante erecta</i>	Golden Due Drops	9	
19	<i>Araliya</i>	Snowbush	1	
20	<i>Hamelia patens</i>	Texas Firebush	4	

Sl. No.	Scientific Name	Common Name	No. of Plants	Image
21	<i>Chamaedorea elegans</i>	Parlor Palm	3	
22	<i>Euphorbia milii</i>	Crown of Thorns	3	
23	<i>Ficus racemosa</i>	Cluster Fig	4	
24	<i>Dracena vermelha</i>	Cordyline Fruticosa	2	
25	<i>Dracena marginata</i>	Spanish Dagger	4	

Sl. No.	Scientific Name	Common Name	No. of Plants	Image
26	<i>Portulaca grandiflora</i>	Button Rose	1	
27	Aracaceae	Palm Tree	47	
28	<i>Cocus nucifera</i>	Coconut Plant	3	

Observations and Suggestions

The college campus is situated in the heart of Bangalore city, in Rajarajeshwari Nagar, an urban locality. The campus covers an area of approximately 30,000 square feet, featuring well-planned infrastructure that includes classrooms, laboratories, a library, seminar halls, and a cafeteria. Despite its limitation in area, the college has maintained 17 trees across 9 species, alongside 156 potted plants and shrubs of 28 species.

The potted plants are strategically arranged in classrooms, corridors, and offices, these plants improve air quality and elevate the ambiance. Their range includes everything from hardy succulents to eye-catching flowering varieties, each contributing unique shapes, textures, and hues that craft dynamic indoor environments.

To make the college campus greener within limited space, the is suggested to practical and implement the following:

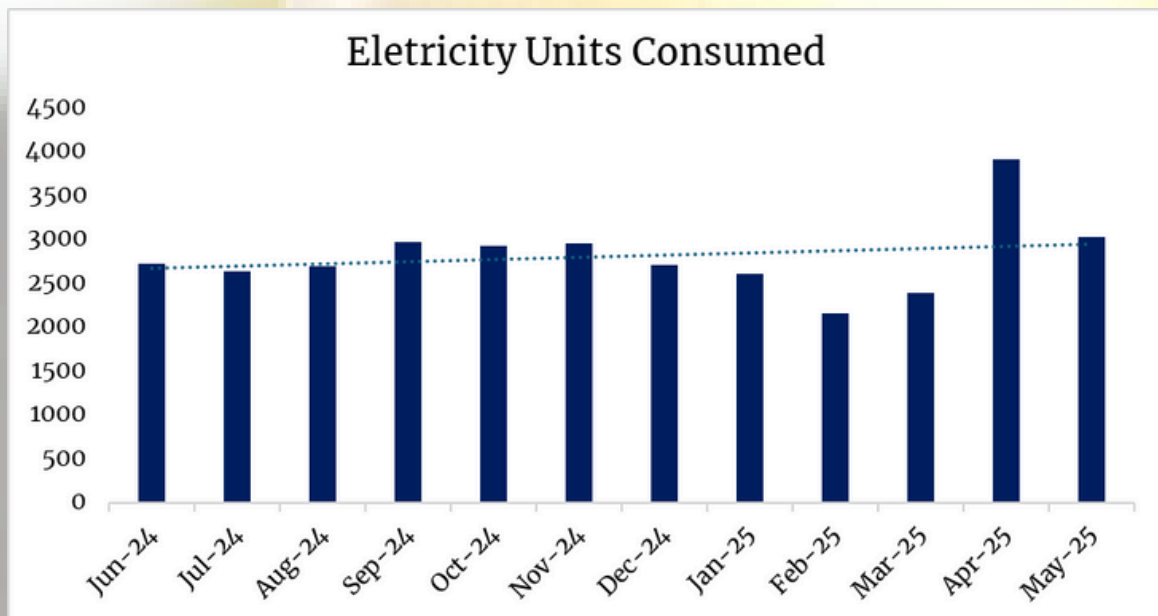
- **Vertical Gardening and Green Walls:** Utilize vertical spaces on building walls and fences to grow plants using vertical gardens or green walls. This maximizes greenery without occupying much ground area and improves air quality while adding aesthetic appeal.
- **Terrace gardens:** Increase the number of potted plants using container gardening on rooftops, balconies, and corridors. Choose low-maintenance, air-purifying, and flowering plants that thrive indoors or in semi-shaded areas.

A glowing lightbulb with a green plant growing from its base, symbolizing energy and sustainability. The lightbulb is illuminated, casting a warm glow. The plant has several green leaves and is growing out of the base of the bulb. The background is a soft, out-of-focus green and yellow.

ENERGY AUDIT

Electricity Bill Analysis

An energy audit of a college is a systematic examination and analysis of how energy is consumed across the campus, aiming to identify areas of energy waste and inefficiency. It involves collecting data on energy use via electricity bill and generator usage analysis to highlight opportunities for energy conservation. The audit provides actionable recommendations to optimize energy efficiency, reduce consumption, lower operating costs, and promote sustainability, thereby helping the college manage its resources responsibly while maintaining a comfortable and productive environment for students and staff.



In the event of power outages or grid failures, the college maintains a diesel generator as a contingency power source to guarantee the regular provision of electricity. The diesel generator has an 82.5 kVA capacity, and the institution has operated the generator for ~17-20 hours, estimated based on fuel consumption.



Suggestions and Recommendations

Motion Sensors: To automate the deactivation of lights in unoccupied rooms, such as classrooms, hallways, restrooms, and other designated spaces, install motion sensors. This practice mitigates superfluous energy wastage.

Implementing Energy-Efficient Appliance Upgrades: Ensure that all campus facilities are equipped with energy-efficient appliances and equipment, including HVAC systems, refrigerators, computers, and printers, that are at least four ENERGY STAR-certified and adhere to stringent energy efficiency standards.

Renewable Energy Sources: To generate clean electricity and reduce reliance on grid power, the college should explore the possibility of integrating renewable energy sources, such as solar panels, into its campus infrastructure.

The college can not only reduce its environmental impact but also achieve cost savings on utilities and showcase its dedication to sustainability to the campus community and beyond by implementing these energy conservation measures.

The background of the entire image is a soft-focus green. In the center, the words "ENVIRONMENTAL AUDIT" are written in a large, bold, black, sans-serif font. Surrounding the text are several white icons, each enclosed in a wireframe sphere. These icons include: a cloud with "CO2" inside, a group of three people, a globe, a wind turbine, and a leaf. A large, detailed wireframe globe is positioned to the right of the text. At the bottom of the image, a human hand is shown from the palm up, holding the wireframe globe. The overall theme is environmental sustainability and global impact.

ENVIRONMENTAL AUDIT

Rainwater Harvesting from Rooftop

The college has implemented a rainwater harvesting system that collects rainwater from rooftops and directs it into percolation pits or recharge wells. This solution harnesses the natural resource of rainwater.



Observations and Recommendations

The college has implemented a well-designed rainwater collection system to collect rainwater from the rooftop and redirect it for groundwater recharge. This represents a noteworthy milestone in the implementation of sustainable water management practices.

Currently, the rainwater storage tanks at the college are insufficient in capacity to store the harvested rainwater effectively. This situation provides a favourable circumstance for enhancing water management practices. It is imperative to acknowledge and rectify this constraint to optimise the advantages of rainwater harvesting and advance the sustainable practices of the college.

It is imperative to prioritise the augmentation of rainwater storage tank capacity to effectively manage the considerable quantity of precipitation collected from rooftop areas. By augmenting its storage capacity, the college can effectively capture and retain more precipitation-induced rainwater, ensuring a dependable supply for various water applications throughout the year.

Colleges should consider the following systems in the future:

Explore the possibilities of establishing water recycling technologies, including reverse osmosis and membrane filtration systems, designed to purify collected rainwater for use in campus structures. Utilising rainwater resources optimally can lead to a decreased dependence on municipal water sources. The college should also explore the possibilities of establishing a small STP on campus.

