



**Swami Keshvanand Institute of Technology
Management & Gramothan, Jaipur**

INTERNAL ENVIRONMENTAL AUDIT REPORT

2017-18



Prepared by

**Swami Keshvanand Institute of Technology, Management & Gramothan,
Ramnagar, Jagatpura, Jaipur-302017, INDIA**

Approved by AICTE, Ministry of HRD, Government of India

Recognized by UGC under Section 2(f) of the UGC Act, 1956

Tel.: +91-0141- 5160400 Fax: +91-0141-2759555

E-mail: info@skit.ac.in Web: www.skit.ac.in



Internal Environmental Audit Report
of
Swami Keshvanand Institute Of Technology Management & Gramothan, Jaipur

Table of Contents

S. No	Content	Page No.
1.	Executive Summary	3
2.	Environment Audit Assessment Team	4
Introduction		
3.	Introduction to environmental audit	5
4.	Need for environmental audit	6
5.	Objectives of Environmental Audit	6-7
6.	About the Institute	8-9
Methodology		
7.	Methodology	10
Data Analysis		
8.	Auditing for Water management	10-11
9.	Auditing for Green Area Management	12-14
10.	Auditing for Waste Management	15-16
11.	Auditing for Biodiversity conservation	17
12.	Auditing for Energy Management	18-20
13.	Auditing for Clean Air	21
14.	Suggestions	22
15.	Conclusion	23
16.	References	23
17.	Annexure – Glimpses of Green SKITM&G Campus	24-27

Executive Summary

An environmental audit is a type of evaluation intended to identify environmental compliance and management system implementation gaps, along with related corrective actions. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generation of students, Swami Keshvanand Institute of Technology, Management & Gramothan (SKITM&G) Jaipur (Raj.) has made a self-inquiry on environmental quality of the campus with the following main objectives:

- The purpose of the audit is to make sure that the practices followed in the campus are environment friendly.
- The specific objectives of the audit are to evaluate the compliance with the applicable regulations, policies, and standards to ensure that the development of the campus foster to the concept of environmental sustainability.
- To identify gaps and suggest recommendations to improve the environment quality status of the institution.

As an Institution of higher learning and research, SKITM&G is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends of environment degradation.

Being a premier institution of higher learning, SKITM&G is aware of its responsibilities towards environmental issues and therefore has resolved to play a major role in the education, research, policy formation and information exchange necessary for a sustained environmental campaign.

The methodology included physical inspection of the campus, observation, and review of the documentation, interviewing key persons and data analysis, measurements, and recommendations. It works on the several facets of 'Environmental conservation and sustainability' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit was to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Institutions/Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health, learning outcome, operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

This report is compiled by a committee constituted by the college. As there was no standard model for such an environment audit of campuses in the state, the committee with the help of the staff/student volunteers who are part of the ECO friend Club, Renewable Energy Club, the major part of the data was compiled, which the committee analysed. The committee has made short term and long-term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of Institute authorities and also all stake-holders of the Institute.



Environment Audit Assessment Team

S.No.	Name	Designation & Department
1.	Dr.Vinita Sharma	Professor, Chemistry
2.	Dr.poonam Ojha	Assistant professor, Chemistry (Eco-friend club)
3.	Mr.Sourabh Singh	Assistant Professor, Civil
4.	Harshita Sharma	Student, Computer Science
5.	Badal Singh	Student, Electrical Engineering
6.	Vishal Dandia	Student, Information Technology,
7.	Kusum Sharma	Student, Electronics & communication



Introduction to environmental audit

Environmental Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Environmental Audit' aims to analyse environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Environmental Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out such audit.

Environmental Audit in Academic Institutes

In 2006, Government of India has declared the National Environment Policy 2006 and made green audit mandatory to each industry. According to the policy it is a response to India's national commitment to a clean environment, mandated in the constitution in Articles 48 A and 51 A (g), (DPSP) strengthened by judicial interpretation of Article 21 (National Environmental Policy 2006).

It is recognized that the maintenance of the healthy environment is not the responsibility of the state alone. It is the responsibility of every citizen and thus a spirit of partnership is to be realized through the environment management of the country. The process of environmental audit was formalised by Supreme Audit Institution (SAI) according to the guidelines given in Manual of Standard Orders (MSO) issued by Authority of the Controller and Auditor General of India 2002.

The Supreme Audit Institution of India is the highest national Institution of auditing in the country. By realizing the need of responsibility towards environment, NAAC, an autonomous body under UGC has added the concept of environmental audit in accreditation methodologies of universities and colleges.

Environment audit can be useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling projects or to improve waste minimization plan.

It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of environment impact on campus.

Need for environmental audit

If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the SKITM&G evaluates its own contributions toward a sustainable future.

As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

Develop an eco-friendly approach to carry out the activities of the college as per the environmental norms. The need of the environmental audit is to provide framework far:

1. To safeguard the environment within the campus.
2. To motivate all stakeholders for optimised sustainable use of available natural resources.
3. To increase awareness among staff and students regarding different issues and solutions related to environment.
4. To enhance skills among the stakeholders to for environmental conservation and protection.
5. To frame the green policies that will enhance the ecological efficiency in the campus.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Environmental & Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

Objectives of environmental audit

The main objective of the environment audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe, and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies, and standards.

In its pursuit for improving environmental quality and to maintain a pristine environment for the future generations of students, SKITM&G College has made a self-inquiry on environmental quality of the campus with the following objectives to achieve:

1. To undertake baseline survey regarding implementation of green practices in the College campus.
2. To identify and analyse significant environmental issues in campus.
3. To generate awareness among masses regarding various environmental issues.
4. To examine the current practices which can have impact on the environment such as of resource utilization, waste management, energy conservations, etc.



5. To provide alternative eco-friendly practices to meet the needs of the campus without affecting the environment of the campus.
6. To improve resource use through reduction in material use, to minimize wastes and to identify recycling opportunities.
7. To prepare environmental audit report and listing the green practices followed by College.
8. Development of ownership, personal and social responsibility for the university campus and its environment.
9. Developing an environmental ethic and value systems in young people.
10. To promote the concept of sustainable development to minimize the exploitation of natural resources.



About the Institute

Swami Keshvanand Institute of Technology, Management & Gramothan (SKIT) inspired from the learnings of Swami Keshvanand, was established in the year 2000 by Technocrats and Managers Society for Advanced Learning. Today the institute is recognized as one of the centres of academic excellence in Northern India. The institute is affiliated to Rajasthan Technical University (RTU), Kota, approved by All India Council for Technical Education (AICTE), New Delhi and Govt. of Rajasthan. Engineering branches are accredited by National Board of Accreditation (NBA), New Delhi and also by Institution of Engineers (I), Kolkata. SKIT offers –

Under Graduate Programme-B.Tech. (Bachelor of Technology) - Duration: 4 Years

1. Civil Engineering
2. Computer Science and Engineering
3. Electrical Engineering
4. Electronics and Communication Engineering
5. Information Technology

Post Graduate Programme -M.Tech. (Master of Technology) - Duration: 2 Years

1. Computer Science
2. Digital Communications
3. Power Systems
4. Production Engineering
5. Renewable Energy
6. VLSI Design

M.B.A.(Master of Business Administration) - Duration: 2 Years

- 1 Finance
- 2 Human Resources
- 3 Marketing

Research/Doctoral Programme-Ph.D (Doctor of Philosophy)

- 1 Computer Engineering (SKIT research centre is recognized by RTU, Kota)
- 2 Electrical Engineering (SKIT research centre is recognized by RTU, Kota)
- 3 Electronics and Communication Engineering (SKIT research centre is recognized by RTU, Kota)

Located in the Pink City Jaipur, which is a blend of traditional history and modern outlook, SKIT is putting in efforts for making industry ready engineers and managers through effective Industry –Institute Interface. Apart from University curriculum SKIT also pursues activities for research and development in various fields.



The Vision of the Institute is “**To promote higher learning in advanced technology and industrial research to make our country a global player**” and the mission “**To promote quality education, training and research in the field of Engineering by establishing effective interface with industry and to encourage faculty to undertake industry sponsored projects for students**”

The institution is developed with intellectually vibrant ambience in a serene and lush green environment. Comprising smart buildings with well-equipped lecture theatres, tutorial rooms, laboratories, Wi-Fi connectivity, hostels, canteen, mess, sports grounds, Learning Resource Centre, all in an eco-friendly environment.

The institute has one N.S.S. unit, which is doing tremendous job through organizing activities like blood donations, tree plantations, health check-up, etc. are conducted by this unit.

Swami Keshvanand institute of technology, management & Gramothan offering Academic and Research facilities to about 4124 students including research scholars in various Departments and Centres. A total of 500 teaching faculty and nonteaching staff are effectively working for the smooth functioning in the Institute.

The entire campus combines spacious and technologically driven blocks that are stretched with sprawling green areas. The various blocks are multi-storied buildings empowered with properly ventilated and spacious classrooms, laboratories and tutorial rooms and various seminar halls and auditoriums. The classrooms are equipped with smart classroom applications and audio and visual aids that foster quality training.

SKITM&G is using land for diverse purposes so that facilities are provided to all concerned for the smooth functioning and working. The Institute covers an area of 13.2 acre. After digital image processing of the area, the information about the area occupied by the various land uses from the map is gathered. The data is reflected in Table.

Table. Area under various land uses in the Institute.

Land use	Area (in Sq-mtr.)
Built up	14258.79
Green spaces	8875
Playground	12270.14
Road	13744.22
Vehicle Parking Spaces	1795.62
Others	2474.73
TOTAL AREA	53418.50

Methodology of Environmental Auditing

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the environment policy adopted by the institute.

To perform environment audit, the methodology included different tools such as physical inspection of the campus, observation, and review of the documentation, interviewing key persons and data analysis, measurements, and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

1. Water management
2. Green area management
3. Waste management
4. Biodiversity conservation
5. Energy Management
6. Clean Air

Auditing for Water management

Water audit is conducted periodically to determine water supplied in the distribution system as well as water lost and/or used within a distribution system. It aims to establish the water consumption pattern in individual sections, so as to realise the consumption levels with respect to exploring various pollution prevention and waste water minimisation opportunities. Water audit also helps to establish the existing water distribution system as well as waste water collection and recycling, if any. The water is supplied in the college by the ground water supply. The storage capacity of water in the college is shown in Table

Table. Total water storage capacity in the Institute

S.No.	Storage Resources	Number	Storage Capacity (in litres)
1.	Water Tanks	05	663,935
2.	Underground water tanks	03	46,433
3.	Total Storage Capacity		710,368

The total water consumption in the Campus is 2.50 lac litres per day in summers and 1.50lac litres per day in winters. The utilizations of such a huge resource of water include usage for cooking, drinking, cleaning, laboratory use, garden use, leakages and overflows sometimes. The waste water generated is disposed off into the underground sewage tanks through waste water drainage to STP in college campus.



Photo- Bore wells in the college

Moreover, Construction of bunds, terraces and drains has led to collection the run off and thus conserving the rainwater by rain water harvesting system in college.

The Institute is presently dependent on Bore wells which are presently 7 in numbers. The water is hard with average prevailing TDS 700.

During the survey, no loss of water is observed, neither by any leakages, nor by overflow of water from overhead tanks. Water quality is enhanced by using ROs system installed in the campus to provide potable water.

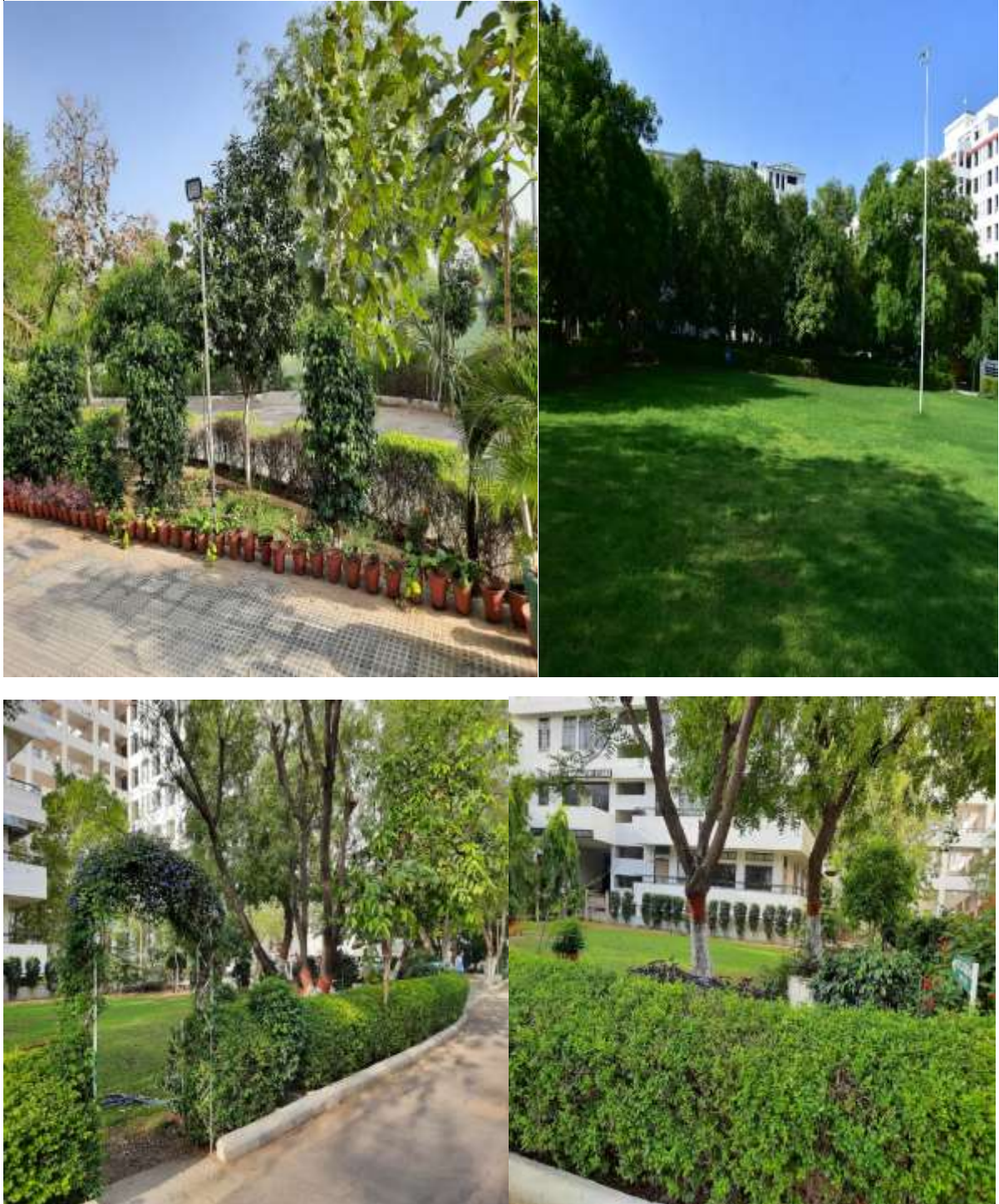
RO System	Number	Capacity (in litres)
1	01	20
2	01	250
3	02	500
4	02	1000



Photo-RO System in SKITM&G

Auditing for Green Area Management

Due to extensive plantation drives the campus is turned into a lush green spot with fair magnitude of biodiversity. More than 3000 thousand saplings planted in the campus have assumed a full canopy now and have attracted a lot of faunal diversity including birds, reptiles and small mammals.



Photos-Green Spaces and Parks in SKITM&G Campus



Photo-Green Spaces and Parks in SKITM&G Campus

This includes the plants, greenery, and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programmes.

The Institute has maintained the existing and added to the land scape environment of the Campus. This has made the campus layout beautiful and has been appreciated by all dignities and visitors visiting the campus. Campus is located in the vicinity of many trees (species) to maintain the biodiversity. Various tree plantation programs are being organized at university campus and surrounding villages through NSS (National Service Scheme) unit, ECO Club etc. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers.



Photo-Plantation drives carried out in SKITM&G

Auditing for Waste Management

Solid Waste Management-The solid waste management is in order with the installation of dust bins and their daily cleaning. The Institute has its own collection facility that collects the solid wastes daily from canteen, mess, Hostels and Departments. This helps in maintaining the cleanliness by providing an efficient, safe and regulated management of solid wastes in the Campus.



Photo-Solid waste collection service and dustbins provided by SKITM&G

The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Single sided used papers are recommended for use for writing and printing in all departments.

Most of the official correspondence is through emails. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. The solid waste is collected by the municipal corporation and disposed by their methods.

The data showed that the total generation of solid waste in the Campus is 500 kg per day. Out of which non-biodegradable is 50 kg per day while the biodegradable is 450 kg per day.

First of all there is no food waste in campus but in case if any food is left after use then this food is distributed between needy persons around the college.

Waste generated from tree droppings and lawn management is a major solid waste generated in the campus. It is noteworthy that SKITM&G has adopted an environmentally sound practice of converting biodegradable waste into composting which is a useful resource. The composting produced is used in the gardens of the Institute.



Photo- Composting in SKITM&G

Liquid Waste Management

Liquid wastes that are generated in the institute are-

- Septic tank effluents from various sanitary blocks.
- Water used for washing and cleaning of utensils etc. from canteen and washing of hands.
- Waste water from laboratories using chemicals.
- Reject water from RO plant.

College has got few open drains to convey this water. Wastewater generated from the toilets is disposed of into septic tanks located at different places in the campus and their effluents combined with canteen waste water is used for gardening, watering trees etc. The excess waste water is being directed into natural drain passing near by the campus.

One STP have been installed with following capacity:

- (1) STP No -1 —2.25litre/ day



Photo-STP in SKITM&G

E-Waste Management

E-waste mainly include obsolete electronic devices such as, computer system, servers, monitors, electrical components etc. E-waste are disposed-off through authorized vendors. It is required to establish the authenticity of vendors.

Time to time college conduct swachhata abhiyaan through NSS club, ECO Friend club.

Auditing for Biodiversity conservation:

The practices for the conservation of biodiversity is well adopted in the campus. This is done by planting local tree species, arranging food, and shed for the birds. This indicator addresses the extent of flora and fauna inside the campus and initiatives adopted by the Institute for Maintenance and conservation. The different types of species of plants growing naturally and planted to provide sustainability to the man-made ecosystem.

The college campus is lush green with plantations of ornamental plants, trees, shrubs, and herbaceous species. It has a well-maintained gardens and lawns.

Regular plantation of different types of plants is undertaken on important occasions like "World Environment Day, with the participation of staff and students. The lush green campus of the environment is attracting the migratory bird particularly during the winter seasons. Adequate arrangements have been made to provide water and feed to the birds.



Photos- Arrangement of food and shed for the birds in SKITM&G

Auditing for Energy

According to the definition in the ISO 50002 standard, an energy audit is a systematic analysis of energy use and energy consumption within a defined energy audit scope, in order to identify, quantify and report on the opportunities for improved energy performance.

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in facility.

It quantifies energy usage according to its discrete functions. The energy is utilized in the campus for transportation, lighting, space heating and cooling, running of lab instruments, appliances, water heating, ground water pumping, cooking, etc.

The data regarding the energy consumption in the SKITM&G is as following:

Table -Total energy consumption of the SKITM&G College

S.No.	Energy Sources		Consumption (annual)
1.	Electricity	Electricity Purchased	9.87030 lakh kW
		Generated (Solar Power Plant)	3.63523lakh kW
2.	Fuel	LPG	1825 cylinders
3.	Fuel Oil	Diesel	75,000 litres

The data in table indicated that the Institute utilises renewable as well as non-renewable energy sources to meet its energy needs.

Most of the energy utilized for lighting, space heating and cooling, pumping, running of instruments is supplied by hydropower generated electricity from state government.

In addition to solar, two diesel generators of 320kW &220kW are installed as backup power in case of power cuts.



Photo- Diesel generators installed near Gate No.2

SKIT is the first total green campus in Rajasthan with 900 kW Solar Power Plant (400 kW Rooftop + 500 kW Captive).



Photo- Solar Power Plant, SKITM&G (400 kW Rooftop)



Photo- Solar Power Plant, Bikaner (500 kW Captive)

Most of the energy requirement of the Institute is met by purchased electricity supplied by the State Government. Some amount of energy requirement is met out of the power generated by the Solar Power Plant commissioned in the Institute.

Transportation is an important part of any institution relying on the energy consumption. SKITM&G campus provides transport facility to both students and staff. So Far Institute owns 18 Operational vehicles of different capabilities which are being used for pick and drop services to distant areas, field surveys and other purposes.



Photo-BUS

Vehicle pooling is among both students and faculty and use of bicycles is promoted by Institute. In its eco-friendly approach, the Institute has brought in use an electrically operated cab that runs within the campus carrying differently abled persons to from respective gates to different destinations inside the campus.



Photo- Electrically operated cab

Auditing for Air

Air is one of the essential elements for sustainability of life on this planet. This is often most polluted by humans along with water. It is required monitor its quality frequently to establish its goodness. Physically due to greenery and absence of polluting industries are processes in the vicinity the air quality appears to be very good. In addition the parking area and bus bay are maintained clean by paving and regular cleaning giving no scope for dust rise. Also the road sides are all covered with plants and trees aiding for good air quality.



Photos-Roadside plantation



Suggestions

The committee has made short term and long term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of Institute authorities and also all stake-holders of the Institute.

1. Environmental auditing may be conducted by the Institute in every two years. The college can also offer consultancy projects on environmental auditing for other academic and research institutions.
2. Specific waste management plans should be adopted to manage solid waste in the campus, with the assistance of State Swachhta Mission and use of plastic carry bags, thermocol cup, plate and flex boards should be banned inside the campus.
3. For managing organic wastes, biogas plants may be commissioned at the hostels, canteens, and mess. There should be a system for the management of hazardous wastes.
4. The public lights within the campus may be run with solar panels and the replacement of existing lights should be done with LED lamps.
5. Green habitat concept should be adopted for all the building construction activities of the college in future, which may help a long way in reducing energy usage, increasing aesthetic appeal of the buildings and class rooms, besides reducing carbon foot print.
6. Reuse and recycle of water system are necessary. Although the wastewater from the RO water purifier is used for gardening purpose, the scope can be increased to large scale re-cycling of water
7. Promote environmental awareness through scientific lectures, conferences, seminars, Independent research projects, and community service.
8. Celebrate every year June 5 as 'Environment Day' and plant trees on this day to make the campus Greener.
9. Important and confidential papers after their validity to be sent for pulping.
10. Botanical garden to be established with plants of ethno botanical & medicinal importance.
11. More underground water tanks are required for water storage and metering of water from bore well and other sources in different uses should be installed.



Conclusions

The environmental awareness initiatives undertaken by the Institute in the ten years of its existence are substantial. The installation of one units of STP for waste management and rain water harvesting systems is noteworthy. Besides, environmental awareness programmes initiated by the administration/departments shows how the campus is going green. Few recommendations are added like more efficient waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus, thus fostering sustainable environment and community development.

As part of environment audit of campus, we carried out the environmental monitoring of campus including illumination and ventilation of the classroom. It was observed that illumination and ventilation is adequate considering natural light and ICT facility are provided in all the Lecture Theatres and Classroom on need basis. In addition, WIFI is provided to the entire Campus including Hostels.

References:

- The Environment [Protection] Act — 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 — the Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011)
- Energy Conservation Act 2010.
- The Water [Prevention & Control of Pollution] Act — 1974 (Amended 1988)
- The Air [Prevention & Control of Pollution] Act — 1981 (Amended 1987) the Air (Prevention & Control of Pollution) Rules — 1982
- E-waste management rules 2016, Electrical Act 2003 (Amended 2001) / Rules 1956(Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices



Glimpses of Green SKITM&G Campus



Glimpses of Green SKITM&G Campus



Glimpses of Green SKITM&G Campus



Glimpses of Green SKITM&G Campus