Shriram Mahila Vidnyan Mahavidyalaya, Paniv

ENVIRONMENTAL,GREEN AUDIT AND ENERGY AUDIT REPORT

Enviro Tech Consult Private Limited
And
NSVK ENGINNERS

Shriram Mahila Vidynan Mahavidyalaya Paniv
Tal.Malshiras,Dist.Solapur

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Our special thanks are due to

- Hon. Mr. Prakash Shamrao Patil- President
- Hon. Adv. Abhishek Prakash Patil- Secretary
- Hon. Mr. Karan Prakash Patil- Joint Secretary
- Mr. Vinod Vishnu Babar- Special Executive officer
- Dr.Madhusudan Trimbak Bachute - Principal

For giving us necessary inputs to carry out this very vital exercise of GreenAudit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

Profile of Audit Team Members

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DISCLAIMER

Audit Team has prepared this report for Shriram Mahila Vidnyan Mahavidyalaya, Paniv based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered. It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

1.0 Introduction

Energy, Environmental & Green Audit is one of major parameters for institute development. These parameters covered under criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

Definition & Objectives of Energy Management

The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect.

As per Bureau of Energy efficiency Energy management defines as

"The judicious and effective use of energy to maximize profits (minimize costs) and enhance competitive positions"

AND

"The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total costs of producing the output from these systems"

The major aim of energy management is

- To minimize energy costs / waste without affecting production & quality.
- To minimize environmental effects.

For Energy management energy audit is an important parameter. As per energy conservation act energy audit is defined as

"The verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption"

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects." Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness.

values and ethics. It provides staff and students better understanding of green impact on campus. 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 college evaluate 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.

1.1 About the Sanstha

Shriram Shikshan Sanstha has been an outstanding charitable institution & is well known for its quality education. SSS is situated in a small village called Paniv located in Malshiras Taluka of Solapur District in Maharashtra. The surrounding area is highly drought prone. The nearest Bus Stand (Transportation), Market and Hospitals are situated ~7 kms away from Paniv i.e., in a town called Akluj. The nearest metropolitan city is Solapur i.e., 115 kms from Paniv. Prior to the inception of SSS, the only educational facility available to the youth was in Akluj. It was highly tedious for the students especially girls to travel that far in order to seek education. Moreover, since there was only one institute, it was impossible for everyone to get admission. The Trustees of SSS donated a land covering 20 acres focused on providing educational services, hostels and transport to make it convenient for students from rural area to seek quality education at an affordable cost.

Shriram Shikshan Sanstha came into existence with motto "Na hi Dnyanen Sadrusham Pavitramih Vidyate" in the year 1991. The Shriram Shikshan Sanstha's visionary founder Ex. MLA Hon. Late. Shamrao Patil established this Sanstha with vision to cater educational needs of people in the rural area. After that under the leadership of Mr. Prakash Patil and Mrs. Shrilekha Paatil, various educational streams have been established under one umbrella for multidimensional development of students. Today the total strength of the students in SSS has reached 4169 comprising of 1680 girls and 2489 boys. It started initially with Shriram Vidyalaya in 1999 to make available school education for Students in Paniv and around. After that by identifying local and global needs various professional and traditional institutes have been established- Shriram Highschool School (2000), College of Pharmacy (2006), Shriram Institute of Information Tech. (2008), Shriram Institute of Engineering & Tech. (Poly) (2008), Shriram College of Agriculture & Allied colleges (2013), Shriram Mahila Vidnyan Mahavidyalaya (2014) and Shriram Institute of Nursing (ANM/GNM) (2022). Along with traditional education, by adopting skill-based education & effective use of modern technology to make students globally competent, Shriram Shikshan Sanstha has paved a path for quality education to our beloved stake holders-students.

1.2 About the Institute

College is established at an ancient historical village named Paniv in 2014 by Shriram Shikshan Sanstha in Solapur district. It is situated ~7 km away from Akluj City. Our aim is to open all portals of prosperity and stability to the learners so that one can aim at the complete development of society. We further try our best to offer equal opportunities to all so that one can

achieve the excellence and seek at greater chances to prove themselves, we are also aiming at developing good human beings nurturing good morals and values.

Shriram Mahila Vidnyan Mahavidyalaya (SMVM) operates under the prestigious banner of Shriram Shikshan Sanstha. This college is affiliated to Shreemati Nathibai Damodar Thackersey Womens University, Mumbai. We are giving the full leaf justice to our college motto "Na hi Dnyanen Sadrusham Pavitramih Vidyate". Currently college runs B.Sc. (Chemistry) and M.Sc. (Analytical chemistry) programs. Initially college started with 31 students. At present the strength of this college is about 300 students.

The institute belongs 20 acres land, with spacious playground and other necessary amenities What we found is institute provided following facility at the college campus: .

1. ICT enabled classrooms (Including Smart Board and Projectors)
2. Computer lab.
3. Appropriately stocked Library
4. CCTV protected campus
5. Bus facility for transportation.
6. ATM facility in college premises
7. Cafeteria
8. Girls common room
9. Biometric attendance Machine
10. Water purifier
11. Corridor for events
12. Security room
13. Disable barrier free campus

14. Play ground

15. Seminar Hall

16. Parking zone for two wheelers and four wheelers

17. Excellent hostel and mess facilities for girls.

18. Well-furnished guest house

19. Health care centre appointed with physician

Institute has established with Vision and mission as

Vision

"To be an excellent center for empowerment of women by providing quality Science education through curricular, co-curricular and extra-curricular activities so as to make them competent and responsible citizens of the nation."

Mission

1. To imbibe human values among the students through various activities.
2. To inculcate the scientific temper among the students.
3. To enhance job potential of students through various activities like soft skills development, communication skills development, skill-based add-on short-term courses, experiential learning etc.
4. To make students skillful in handling laboratory equipment.
5. To make students techno-savvy by enabling them to use the upcoming technology like computer, internet, and various software's in chemistry.
6. To make students self-sufficient to protect themselves and others through Yoga, Karate, art of living etc. training and organizing awareness camps.
7. To develop social attitude among students.
8. To follow the inclusive policy.
9. To assist students to get scholarship from various agencies.

1.3 Details of Programme/ Level

The programmes offered by the college at different levels are U.G.,P.G. and Certified courses. Details of programmes offered by the college is as below

Sr. No.	Programme/ Level	Name of Programme, Course	Duration
01.	U.G.	B.Sc. (Specialization in Chemistry, Botany and Zoology subsidiary subjects)	3 Years
02.	P.G.	M.Sc. in Analytical Chemistry	2 Years

The college is in the rural area implementing number of programmers such as Bridge course, Training and Placement center, Competitive Exam guidance, Internship in industries, experiments learning through field units, Industrial visits.

The college has rich tradition of co-curricular and extra-curricular activities such as NSS, Sports and Cultural Activities, which play an important role in the overall personality development of the students. The Career Guidance Centre makes its presence felt by providing necessary information and guidance to the students as and when required.

Teaching staff of the college is qualified. Institute has qualificationwhPh. D, M.Phil. and NET / SET teachers. Some of them are doing research. Some of them have completed minor and major research projects financed by UGC.The college has organized a State level seminar on IPR and RM and state level workshops. The students are also reciprocating by their high achievements in academic performance.

1.3 Location of College

SSS is situated in a small village called Paniv located in Malshiras Taluka of Solapur District. The surrounding areas are highly drought prone and have been neglected by the government authorities. The nearest Bus stand (Transportation), Market and Hospitals are situated 7 kms away from Paniv i.e., in a town called Akluj. The nearest metropolitan city is Solapur i.e., 115 kms from Paniv.

Location:- 17°50'23.9"N ,74°58'14.0"E

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CERTIFICATE

GREEN AUDIT CERTIFICATE

Academic Year 2022-23

This is to certify that Shriram Mahila Vidnyan Mahavidyalaya, Paniv Tal-Malshiras Dist.- Solapur, Maharashtra has taking and implementing respectable initiatives for conservation and protection of Environment.

We, Enviro Techno Consult Private Limited, Nagpur have satisfactory and successfully completed the work of audit based on the site situation and information provided with support of Principal, staff of Shriram Mahila Vidnyan Mahavidyalay, Paniv

Dr. Prashil Shukla
Signature & Seal

Date:- 17/05/2023

3.0 Green/Environment Audit

3.1 Objectives

The main objective of the Environment/Green audit is to promote the management and conservation of Environment 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.

The main objectives of carrying out Green Audit are:

- *To Document the Green Plantation and Plant Diversity*
- *To Document the Water Analysis report of the college*
- *To document the waste disposal system*
- *To document the ambient environmental condition of air, Soil and noise of the college*

3.2 Methodology

In order to conduct the green audit, the methodology included different tools such as

- Preparation of questionnaire,
- Preparation of data collection formats
- Collection of data
- Physical checking of the campus,
- Observation and review of the documentation,
- Interview of 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:

- Green area management
- Waste management
- Water Analysis Report
- Ambient environmental condition of air, Soil and noise

3.3 Green Audit

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green 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 Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and Exxon Valdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented. The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmentally friendly institute.

3.4 Green Area/Plantation

Green area or plantation includes the plant, greenery and landscaping of the campus to enhance the environment of the area. This will help to increase the beauty of the campus. The college area is diverse with a variety of plant species performing a variety of functions. Most of the plant species are planted through various plantation programs organized by the college.

The plantation in college have increased the quality of life, not only in college campus but also the surrounding area in term of temperature control, contributing to improving air quality, soil conservation, water conservation and habitat for birds and small animals etc.

Greenery at College Main Building

Green Plantation area at main function area of college

3.5 Plant Diversity

- Total 62 plant species are observed in the college campus area.
- About 442 number of total trees are planted in college campus area.
- College conducted and participated in various Planation activity programs are being organized at college campus and surrounding villages through NSS unit.
- This program conducted through the students and helps in encouraging eco-friendly environment which provides pure oxygen within the campus and awareness among nearer villagers.
- The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.
- College actively participated in 2 Cr tree plantation programme of Government of Maharashtra.

Recommendations:

- Review yearly the list of trees planted in the college campus, botanical garden, and allots numbers to the trees along with scientific /botanical and local/common name to the trees
- Select endemic or local species for the planation
- Considerations for selection of plant species

  o Plants that show vigorous growth, and higher forage value

  o Plants having ability of fixing nitrogen

  o Preferably indigenous, endemic and rare species

  o Plant that serves as nesting, feeding and breeding site for fauna

  o Plants species having high fodder and fuel value

  o Plant that enhances the aesthetics of the surrounding areas

  o Plants species having importance in soil binding

  o Plant species with different height, growth habits and bole shapes

o Species tolerant to specific conditions or capacity to endure water stress and climatic extremes after initial establishment

o Economically important plant species

- Avoid plantation of exotic plant species in college campus.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Conduct small workshop or training programme for the students on medicinal plants
- Establish Environment Policy for the environment conservation nd protection of college.
- The Environmental cell shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Conduct six monthly internal audit to ensure that implementation of activities for the environment planned for the year, action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as „Environment Day", wildlife week and plant trees on this day to make the campus Greener.
- Establish Green library for the students.
- Prepare five year planation programme /Plan in consultation with management and students.
- Establish nature club
- Organize exhibitions like plant painting, flower painting, flowers, posters etc.
- Develop seed bank under botanical garden programme

3.6 Solid Waste Management

To reduce waste in the college campus, recycling efforts are taken. Waste is collected and segregated properly. Students, faculty, and staff are aware and educated on proper waste management practices such as waste source and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste is divided into two categories: dry waste and wet waste

- Wet waste: biodegradable waste
- Dry waste: no Biodegradable waste

3.6.1 Observations

The waste generated in the campus includes glass, metals, wrappers, paper, plastics, etc. Old newspapers, used papers and journal files, workshop scrap etc. are given for recycling to external agencies.

Glass, metals, plastic and other non-biodegradable wastes are given to external agencies where they are segregated and disposed/ recycled according to the nature of the waste.

Wet and dry waste is collected by Waste collection vehicle of Paniv Grampanchyat Clean and neat College campus was observed during the visit.

4. Water Analysis Report

Water quality testing is important because it identifies contaminants and prevents waterborne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease.

The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for human consumption, or in the environment

Source of water is borewell.

Drinking water indicators

The following is a list of indicators often measured by situational category:

Alkalinity

- Color of water
- pH value
- Taste and odor (geosmin, 2-Methylisoborneol (MIB),etc.)
- Dissolved metals and salts (sodium, chloride, potassium, calcium, manganese, magnesium)
- Microorganisms such as fecal coliform bacteria (Escherichia coli), Cryptosporidium, and Giardia lamblia; see Bacteriological water analysis
- Dissolved metals and metalloids (lead, mercury, arsenic, etc.)
- Dissolved organics: coloredz dissolved organic matter (CDOM), dissolved organic
- Carbon (DOC)
- Heavy metals

अ.नं	घटक	युनिट	प्रमाण	योग्य प्रमाण	शेरा
1	pH		7.46	6.5-7.5	योग्य
2	Electrical Conductivity (EC)	mmhos/cm	3.41	0.1-1.4	अयोग्य
3	TDS	mg/L	291	<700	योग्य
4	Total Hardness	mg/L	260	<600	योग्य
5	Carbonate	mg/L	Absent	-	-

6	Bicarbonate	mg/L	230	<600	सुयोग्य
7	Alkalinity	mg/L	195	<500	सुयोग्य
8	Potassium	mg/L	2.1	<75	सुयोग्य
9	Calcium	mg/L	126	<600	सुयोग्य
10	Magnesium	mg/L	102	<400	सुयोग्य
11	Na	mg/L	53.1	<50	असुयोग्य
12	Sulphate (SO_4^{--})	mg/L	21	<300	सुयोग्य
13	Chloride (Cl^-)	mg/L	233.5	<300	सुयोग्य
14	Mg: Ca	-	0.16	<1.50	सुयोग्य
15	Sodium Adsorption Ratio (SAR)	meq/L	0.96	<10	सुयोग्य
16	Residual Sodium Carbonate (RSC)	meq/L	-9.95	<1.25	सुयोग्य
17	Coliform Count (MPN)	-	Absent	Absent per 100ml	सुयोग्य
18	E Coli		Absent	Absent per 100ml	सुयोग्य
19	Appearance		Clear	Clear	सुयोग्य
20	Odour		Agreeable	Agreeable	सुयोग्य
21	Colour	Unit	0	Max 5 Hazen Units	सुयोग्य
22	Turbidity	NTU	0.30	Max 1 NTU	सुयोग्य

Water Type :- C3 : S1

With help of Yash Agrotech Laboratory (ISO 9001:2015) and ANALAB Laboratory water analysis completed. It is observed that EC is more in water and deviated from standard. Given Water Sample is Suitable for Drinking purpose.

Recommendations: Water sample tested once a year.

4.1 Packed Sewage Treatment Plant (STP)

Packed Sewage Treatment plant, Capacity-20M3/day, is installed in college campus in year 2016. The 20 M3 /day Sewage Treatment Plant is designed for the following raw sewage flow rate: 20 M3 /day

Characteristics: Treatment Concept: Preliminary Treatment + Aerobic Biodegradation treatment followed by Tertiary treatment.

Flow Rate: 20 M3 /day

Source of Water: Domestic sewage. Operation: 24 Hrs.

Space Occupied: 2.5m×2.5 m 3.1

Raw Sewage Characteristics:

Sr,No	Details	Concentration Units
1	pH	**6.5 -8.5**
2	Total suspended solids	≤ 150 - 200 mg/lit
3	Chemical Oxygen Demand (COD)	≤ 400 - 500 mg/lit
4	Biochemical Oxygen Demand (BOD 3 Days @ 27° C)	≤ 200 - 300 mg/lit
5	Oil & Grease	≤ 10 - 15 mg/lit

Treated Water Characteristics: The treated sewage will be odor free and will conform to the following quality standard

Sr,No	Details	Concentration Units
1	pH	**6.5 -8.0**
2	Total suspended solids	Less than 100
3	Chemical Oxygen Demand (COD)	Less than 100
4	Biochemical Oxygen Demand (BOD 3 Days @ 27° C)	Less than 30g/lit
5	Oil & Grease	Less than 10 mg/lit

Note:-Plant is working during the visit.

5. Ambient environmental condition of air, Soil and Noise

5.1 Air Quality

Ambient air quality monitoring was carried out in the college campus to understand the air quality of the campus. Ambient air quality monitored at centre of the campus

Air quality is measure by SMILEDRIVE Portable Air Quality Pollution Meter.

The results are given below Table

Parameter	Unit	Result	NAAQ Standards for 24hrs
PM10	µg/m3	73	100
PM2.5	µg/m3	36	60

Remark:- The results show the concentrations of PM10 PM2.5 were found with in the National Ambient Air Quality Standards (NAAQ).

5.2 Soil Analysis

The first step in soil analysis is soil sample collection. It's important to realize that only a tiny portion of a field is actually analysed in the laboratory. Thus, collecting a representative soil sample is critical for accurate result. As part of a soil analysis the laboratory will usually supply some interpretation, which includes an indication of whether individual soil tests are low, medium, or high. The laboratory may also provide fertilizer recommendations based on the analysis, although these recommendations are plant and soil specific.

With the collaboration of Yash Agrotech Laboratory (ISO 9001:2015) soil analysis completed. Results are shown as follows

Sr.No.	Contains	Unit	Results	Reference Value	Remark
1	सामू (pH)		8.2	6.5-8.5	In Limit
2	Electrical Conductivity (EC)	mmhos/cm	0.72	<1	In Limit
3	Free Lime	%	8	1-5	More
4	Cation exchange apacity(CEC)	Meq/100gm	23.1	15-25	In Limit
5	organic matter (OM)	%	1.58	1.72-3.5	Less
6	Organic carbon (OC)	%	0.65	0.41-0.60	More

7	Available-Nitrogen (Avail-N) & %	Kg/ha	301 & 0.173	280-420 & 0.03 to 0.07	In Limit and More
8	Available -P	Kg/ha	29	30-50	Less
9	Available -K	Kg/ha	228	180-240	In Limit
10	Available -Ca	%	0.60	0.1-3.30	In Limit
11	Available -Mg	%	0.18	0.12-0.30	In Limit
12	Available -S	PPM	8.2	26-50	Less
13	Available -Na	%	5.3	< 5	More
14	zinc - (Zn)	PPM	2.04	0.60	In Limit
15	Copper (Cu)	PPM	2.34	0.25-0.50	In Limit
16	Iron (Fe)	PPM	4.08	4.50	Less
17	Manganese (Mn)	PPM	7.35	2	In Limit
18	Boron (B)	PPM	0.18	<1	In Limit
19	Molybdenum (Mo)	PPM	-	-	-
20	C:N	-	3.75	10-20	Less
21	Ca:Mg	-	3.33	5.5-6.5	Less
22	Mg:k	-	0.007	1.5-2.5	Less
23	Ca : K	-	0.028	1.25-1.35	Less
24	Fe Fe:Mn M	-	0.52 : 1	1.10 : 1	Less
25	Plasmodesmata (PD)	-	0.84	2.65	Less
26	Integrity (P)	%	18.31	40-50	Less
27	soil water holding	%	23.9	41-50	Less

Type of Internal Roads in College campus: - Internal roads in college is semi constructed road. Very less dusty area.

Construction of Building: -

Construction of building is RCC and ventilation is provided through windows and Fan's.

5.3 Noise Level Campus

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound:

- Loudness and
- Frequency

Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level up to 65 dB is considered tolerate. Loudness is also expressed in sones. One sone equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibration per second. It is denoted as Hertz(Hz).

Noise Level is measure by meco 970p(35dB-130dB) Digital sound level meter.

Sr no.	Description	Classroom	Laboratory
1.	Max in dBA	63.2 dB	72.8 dB
2.	Min in dBA	56.8 dB	54.2 db

Remark: Noise level observed slightly higher.

6 CONCLUSIONS

Green and environment audit is the powerful tool to identify the strength and weakness of college in environment area.

This audit is one kind of scientific and professional approach towards accountability in utilization of resources. Green audit is helpful to the college for the identifying, evaluating and managing environmental risks and improvement in waste management, energy, water management etc.

Output of the green audit report in each area will be serve as a guide for educating the college community on the environment related practices and resource usage at the college as well as spawn new activities and innovative practices.

Important Suggestions

- Internal Roads must be completely dust free may be RCC or bituminous material.
- Conduct Health checkup camps for students and faculties
- Adopt an environmental policy for the college
- Establish Environment management Committee of the college.
- Establish a purchase policy for Eco friendly materials
- Conduct seminars and group discussions on environmental education and environment protection
- Involve Students and staff in local environmental problems to solve along with local body and people.
- Establish waste water Treatment system.

7.0 Energy Audit

NSVK ENGINEERS

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Certificate

of

Energy Audit

This is Certified that NSVK ENGINEERS conducted ENERGY of SHRIRAM MAHILA VIDNYAN MAHAVIDYALAYA, PANIV. The initiatives taken by the institute for energy conservations and towards environmental protections are satisfactory.

Date:-17/05/2023

Place:- Solapur

For, NSVK ENGINEERS

Proprietor

7.1 Energy Audit: Types and Methodology

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 a facility. It quantifies energy usage according to its discrete functions. Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management programme.

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption"

7.2 Need for Energy Audit

In any institution, the three top operating expenses are often found to be energy (both electrical and thermal), staff and materials. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction. Energy Audit will help to understand more about the ways energy and fuel are used in any industry, and help in identifying the areas where waste can occur and where scope for improvement exists.

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programme which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc. In general, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame.

The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a " bench-mark" (Reference point) for managing energy in the organization and also provides the basis for planning a more effective use of energy throughout the organization.

7.3 Type of Energy Audit

The type of Energy Audit to be performed depends on: - Function and type of industry - Depth to which final audit is needed, and - Potential and magnitude of cost reduction desired Thus Energy Audit can be classified into the following two types.

- Preliminary Audit
- Detailed Audit

7.4 Energy Audit Methodology

7.4.1 Preliminary Energy Audit Methodology

Preliminary energy audit is a relatively quick exercise to:

- Establish energy consumption in the organization
- Estimate the scope for saving
- Identify the most likely (and the easiest areas for attention
- Identify immediate (especially no-/low-cost) improvements/ savings
- Set a 'reference point'
- Identify areas for more detailed study/measurement
- Preliminary energy audit uses existing, or easily obtained data

7.4.2 Detailed Energy Audit Methodology

A comprehensive audit provides a detailed energy project implementation plan for a facility, since it evaluates all major energy using systems. This type of audit offers the most accurate estimate of energy savings and cost. It considers the interactive effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. In a comprehensive audit, one of the key elements is the energy balance. This is based on an inventory of energy using systems, assumptions of current operating conditions and calculations of energy use. This estimated use is then compared to utility bill charges.

7.5 Preliminary Audit

7.5.1 LT/ HT-

For the institute LT connections observed during the walk-through audit.

Sr.No.	Energy/Power Suppler	Meter No.	Remark
1	Maharashtra State Electricity Distribution Company Limited.	338700871038	073/LT-X B I 0-20kW Pub Ser Oth

7.5.2 Energy Scenario

Sr. No.	Particulars	Any one month	Annual
1.	Electrical Units (kWh)	470	5486
2.	Power Factor	0.98	0.976

7.5.3 Energy Cost of each as % of Total Electrical Cost

From the electricity connection total electricity annual cost for the unit has been calculated. Unit consumed by the college annually is 5486.Total lighting load is calculated annually is 7.47% of total lighting load. Other 92.52% load consist of other electrical & electronics load like Computers, CCTV, UPS Laptops & other laboratory devices.

7.5.4 kW of each as % of Total Electrical Consumption

As per directives from power/energy supplier college has maintained power factor above 0.976. On date of visit to college power factor measured is 0.98. So total active power is achieved is 98% of total energy consumed.

7.6 Detailed Audit

7.6.1 Need for Energy Conservation

Power shortage hampers the economic growth of any State. Energy Conservation is the cheapest, easiest and cleanest way for bridging the gap between demand and supply. It is estimated that energy conservation projects require only one fifth of investment compared to the investment required for installation of new power projects.

7.6.2 Recommended frequency of Energy Audit

The interval time for the conduct and completion of subsequent energy audit shall be **three years** with effect from date of the report of the first energy audit conducted and completed by Energy Auditor.

7.6.3 General Aspects about Building

7.6.3.1 Connected Load or Contract Demand

The college has level of graduation and post-graduation with specialization. College has different electrical and electronics equipment's. Its connected load is calculated das follows

Sr No.	Load Type Wattage	Quantity	Wattage per Load type	Total Wattage
1	Fan	47	48	2256
2	LED(B)	32	9	288
3	LED(T)	60	20	1200
4	Speaker	3	500	1500
5	AC- Star	2	1500	3000
6	Camera	1	50	50
7	PC	18	200	3600
8	Exice UPS	1	800	800
9	Thumb Scaaning Machine	5	36	180
10	Projector	3	200	600
11	Nescafe Machin	1	200	200
12	Muffle Furnance	1	2000	2000
13	Disintegration Appratus	1	2000	2000

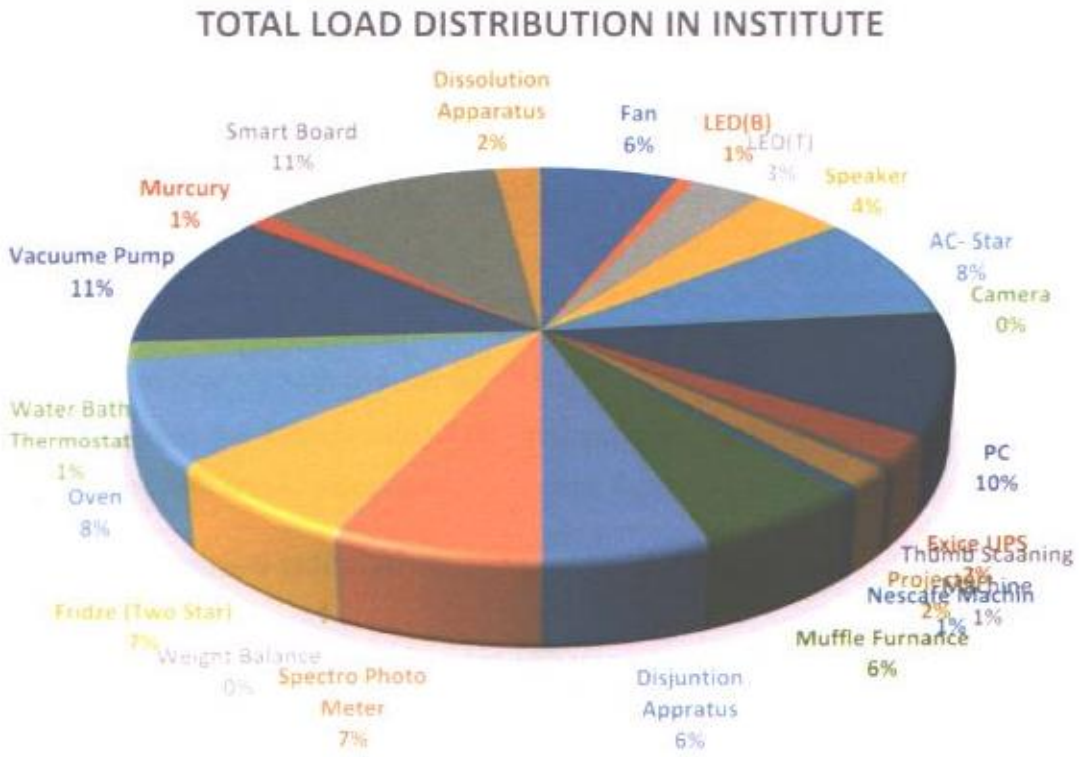
14	Spectro Photo Meter	1	2500	2500
15	Weight Balance	2	20	40
16	Fridze (Two Star)	1	2500	2500
17	Oven	1	3000	3000
18	Water Bath Thermostat	1	500	500
19	Vacuume Pump	1	4000	4000
20	Murcury	1	400	400
21	Smart Board	2	2000	4000
22	Dissolution Apparatus	1	750	750
Total Wattage				35,365

7.6.3.2 Total electricity purchased from utilities

In Maharashtra state main supplier of electricity is Maharashtra state Electricity distribution company limited. Almost all the electricity has been purchased from same supplier. In emergency college has generator unit for supply of electricity.

7.6.3.3 Load distribution pattern (total lighting load, air cooling load and other loads)

For the unit major load is air cooling (Fan) and laboratory equipment's. The detailed load distribution is shown in below load distribution pattern



7.7 payment of electricity bills

Supplier i.e., Maharashtra state Electricity distribution company limited took monthly reading and send energy/electricity bill to consumer. Also on web portal of supplier monthly electricity bill and history of payment and last 12 month energy consumption.

7.7.1 Authority responsible for payment of electricity bills and payment mechanism

Head of the institute is responsible for payment of bill assistance with office staff. Monthly received bill has been procced and paid through bank check, NEFT or RTGS. Sometimes bill has been paid at supplier bill collection centre.

7.7.2 Status of Bill Payments on time/Delay in Bill Payments, percentage paid

No delay in payment has been observed since last 12 month. Bill payment has been made time to time to avoid charges and penalty.

7.7 Energy Saving Measures and Payback period calculation

7.7.1 Energy Saving Majors

When our energy engineers visited institute and find out energy saving measures. Our measurement, analysis and study find following suggestion & recommendations for energy conservation.

- Replace two-star 192-liter refrigerator with five star rated refrigerator
- Replace exiting AC with five-star BEE rated AC
- It is observed that 47 conventional fans are operative in college campus. We recommended to replace with BLDC energy efficient cooling fans.

7.7.2 Pay back period calculation

Payback period complete replacement with recommendations is one year nine months with investment of Rs 1,33,000 having annual saving of Rs.70,000/-

7.8 Requirement of NAAC

7.8.1 Percentage of lighting power requirement met through LED bulbs

Type	Quantity	Load in Watts	% Load
LED (Tube and Bulb)	92	9 and 20	100%
Conventional Lights	Not Found	00	00%
Total	92	9 and 20	100%

Note: No Conventional and energy consumed lighting found in institute premises.

8.0 CONCLUSION

After detailed energy audit of institute it is observed that institute is taking energy conservation measures like LED installation and solar street lights. Still Institute require to take many initiative towards energy conservation. Some of recommendationsare as follows

Audit team recommended following Recommendations for Energy Conservation

- Install rooftop solar system
- Install more Solar Street lights in college campus
- Conventional fan should be replaced with new energy saving BLDC fans
- Establish a Facility Management System, exclusively for energy efficiency activities.

9.0 E-Waste Management Initiative

CPCB India is finalizing the set of rules and most recently issued a formal set of guidelines for proper and eco-friendly handling and disposal of the electronic waste. TheMinistry of Environment and Forests is now processing the rules framed by electronics equipment manufacturers with the help of NGOs.

The Institute initiative for E-waste management is they send their electrical and electronic waste to M/s Green Tech solutions Industries which is Maharashtra pollutions control board certified agency for dismantling E waste using environmental sound technology as per E waste (M) Rule 2016.M/s Green Tech Solutions Industries has consent no BO/MPCB/RO(HQ)/CO/B-1801001022 dt. 25/01/2018

QUALITY COUNCIL OF INDIA
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Certificate of Accreditation

Enviro Techno Consult Private Limited, Nagpur

68, Mahakali Nagar – 2, Near Manewada Square, Nagpur – 440024

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3. for preparing EIA-EMP reports in the following Sectors –*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including both opencast and underground mining	1	1 (a) (i)	A
2	Thermal power plants	4	1(d)	A
3	Cement plants	9	3(b)	A
4	Manmade fibers manufacturing	19	5(d)	B

***Note**: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Nov 18, 2022 and posted on QCI-NABET website.*

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2640 dated Jan 16, 2023. The accreditation needs to be renewed before the expiry date by Enviro Techno Consult Private Limited, Nagpur following due process of assessment.

Sr. Director, NABET
Dated: Jan 16, 2023

Certificate No.
NABET/EIA/2225/RA 0266

Valid up to
Feb 26, 2025

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GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
New Delhi - 110016

Dated: 5th March, 2020

F. No. TU/IV-RD/1711/2019

To

M/s Enviro Techno Consult Pvt. Ltd.
68, Mahakali Nagar-2,
Near Manewada Square,
Nagpur – 440 024 (Maharashtra)

Subject: RENEWAL OF RECOGNITION OF IN-HOUSE R&D UNIT(s)

Dear Sirs,

This has reference to your application for renewal of recognition of your in-House R&D unit(s) beyond 31-03-2019 by the Department of Scientific and Industrial Research.

2. This is to inform you that it has been decided to accord renewal of recognition to the in-House R&D unit(s) of your firm at **Plot No. 68, Mahakali Nagar-2, Near Manewada Square, Nagpur (Maharashtra)** upto **31.03.2024.** Terms and conditions pertaining to this recognition are given overleaf.

3. Kindly acknowledge the receipt of this letter.

Yours faithfully,

Deshpande

(Dr S. K. Deshpande)
Scientist - 'G'

Shriram Mahila Vidynan Mahavidyalaya Parav

ISO 9001:2015

Certificate of Registration

This is to Certify that
Quality Management System of

ENVIRO TECHNO CONSULT PRIVATE LIMITED

68, MAHAKALI NAGAR - 2, NEAR MANEWADA SQUARE, NAGPUR - 440024, MAHARASHTRA, INDIA

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for the following scope :

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Certificate No	: 22IQJV'24		
Initial Registration Date	: 18/02/2022	Issuance Date	: 18/02/2022
Date of Expiry	: 17/02/2025		
1st Surve. Due	: 18/01/2023	2nd Surve. Due	: 18/01/2024

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST LLC

Head Office: Office No. 02, Ground Floor, Sharjah Media City, Sharjah, UAE. e-mail : info@aqcworld.com,
Key Location: A-60, Sector - 2, Noida, Uttar Pradesh, 201301, India

Validity of the Certificate is subject to successful completion of surveillance audit on or before of due date. In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn.

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Date of Expiry*	: 09/12/2023		
1st Surv. Due	: 10/11/2021	2nd Surv. Due	: 10/11/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

AQC MIDDLE EAST FZE.

Head Office: EI-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail:

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Certificate No	: 20IOFE03		
Initial Registration Date	: 30/07/2020	Issuance Date	: 30/07/2020
Date of Expiry	: 29/07/2023		
1st Surve. Due	: 30/06/2021	2nd Surve. Due	: 30/06/2022

Director

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Management Systems
Certification Body
MSCB-119

AQC MIDDLE EAST FZE.

Head Office: E1-1401 L Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE.
Key Location: 403, Madhuban Building, 55, Nehru Place, New Delhi - 110019, India. e-mail: info@aqcworld.com.

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BHUMAPAN KRAMANK 14/2/A/2/P/12/B, AT YESHWANT NAGAR, POST AKLUJ, TALUKA MALSHIRAS, YESHWANT NAGAR, SOLAPUR- 413118, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of

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for the following scope :

PROVIDING CONSULTANCY FOR ENERGY& GREEN AUDIT (INDUSTRIES AND INSTITUTIONS), ELECTRICAL CONTRACTING, ELECTRICAL SAFETY AUDIT, FIRE SAFETY AUDIT, SOLAR LAMP MANUFACTURING, ANNUAL MAINTENANCE CONTRACT, SKILLED -SEMISKILLED AND UNSKILLED MANPOWER SUPPLIER TO INDUSTRIES AND INSTITUTIONS.

Certificate No	: **22EQIM74**		
Initial Registration Date	: 17/10/2022	Issuance Date	: 17/10/2022
Date of Expiry	: 16/10/2025		
1st Surve. Due	: 17/09/2023	2nd Surve. Due	: 17/09/2024

EGAC Accredited
QMS Certification
CAB # 118005

Director

Magnitude Management Services Pvt. Ltd.
B-55, Lower Ground Floor, Sector 02, Noida-201301, U.P, India
e-mail: info@mmscertification.com, website: www.mmscertification.com

* Subject to Successful Surveillance Audit and case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn.

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Certificate No.: 10411 /20

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National Productivity Council

(National Certifying Agency)

PROVISIONAL CERTIFICATE

Shriram Mahila Vidynan Mahavidyalaya Paniv
Tal.Malshiras,Dist.Solapur

This is to certify that Mr./ Mrs./ Ms. **ABHIJITH M R**

son / daughter of Mr. **B RAMACHANDRAN PILLAI** *has passed the National certification Examination for Energy Auditors held in September 2019, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as* ***Certified Energy Manager*** *as well as* ***Certified Energy Auditor****.*

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for Accredited Energy Auditor and issuance of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the Bureau of Energy Efficiency issues an official certificate.

Place : Chennai, India

Date : **24th December, 2019**

Digitally Signed:RAJAGOPAL SURYANARAYANAN
Tue Dec 24 10:08:58 IST 2019
CoE, NPC AIP Chennai

Self attested
(Abhijith M R)

RSuryan

Controller of Examination