SAHYAGIRI ENTERPRISES

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Green Audit

Certificate

This is to certify that the Sahyagiri Enterprises has conducted detailed green audit report of **Shankarrao Jawale Patil Mahavidyalaya, Lohara** during academic year 2020-2021 to assess the green initiative planning, efforts, activities implemented in college campus like plantation, waste management, rain water harvesting, energy conservation, biodiversity conservation and various environmental activities. This green audit is also aimed to assess impact of green initiative for maintenance of the campus.

The college has submitted necessary data and credentials for scrutiny. The efforts taken by the management, faculty and students towards environment and sustainability are highly appreciated.

Green Audit In charge

SAHYAGIRI ENTERPRISES PRIVATE LIMITED

DIRECTOR

GREEN AUDIT REPORT (2020-2021)

Bhartiya Rashtriya Shikshan Sanstha Lohara's

Shankarrao Jawale Patil Mahavidyalaya, Lohara

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1.0 ACKNOWLEDGEMENT

Sahyagiri Enterprises Green Audit Team thanks the management of **Shankarrao Jawale Patil Mahavidyalaya** for assigning this important work of Green Audit. We appreciate the co-operation to our team for completion of study.

Our special thanks to:

- Principal of the college – Dr. V. U. Patil
- IQAC Head – Dr. M.L. Somwanshi
- IQAC Member – Dr. S. S. Patil
- Environment Expert at the campus – Dr. S.V. Sonavane
- Green Audit coordinator & Assistant Professor – Dr. P.V. Mane
- Teaching & Supporting Staff of College

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

2.0 DISCLAIMER

Sahyagiri Enterprises Green Audit Team has prepared this report for Shankarrao Jawale Patil Mahavidyalaya, Lohara based on input data submitted by the representatives of College complemented with the best judgment capacity of the expert team.

It is further informed that the conclusions 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.

Sahyagiri Enterprises and its staff shall keep confidential all information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies. Sahyagiri Enterprises staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

Report by: Mayuri M. Jadhav

3.0 CONCEPT

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green 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 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. Green audit is assigned to the 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.

4.0 INTRODUCTION

A Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. Educational institutions now days are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. The activities pursued by colleges can also create a variety of adverse environmental impacts.

Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives. Green audit is defined as an official examination of the effects a college has on the environment. As a part of such practice, internal environmental audit (Green Audit) is conducted to evaluate the actual scenario at the campus.

Green audit can be a 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 project or to improve waste minimization plan. Green auditing and the implementation of mitigation measures is a win-win situation for all the college, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus.

Green auditing promote financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers. 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.

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues.

Environmental Management Systems (EMS) is very popular in the industrial sector, but the general belief is that EMS is

something pertaining to industries only. Other parts of the world have started adopting compatible environmental management systems either voluntarily or for promoting standards by external certification. International environmental standards do not suit the existing Indian educational system. Hence EHS Alliance has developed a compatible system by developing locally-applicable techniques.

A very simple indigenized system has been devised to monitor the environmental performance of educational institutions. It comes with a series of questions to be answered on a regular basis. Environmental conditions may be monitored from angles that are relevant to Indian requirements, without stress on legal issues or compliance.

This innovative scheme is user-friendly and totally voluntary. The environmental monitoring system helps the institution to set environmental examples for the community and to educate young learners. It can be adapted to urban and / or rural situations.

5.0 OVERVIEW OF INSTITUTE

Shankarrao Jawale Patil Mahavidyalaya, Lohara was established in Osmanabad district in 2002. The college is affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. The main objective of this college is to bring socially disadvantaged, educationally backward people with others through education. Shri. Ramesh Jawale-Patil and other members of Bhartiya Shikshan Sanstha, understood the thirst of education of the people in this area and they sincerely tried to make available the opportunity of higher education to rural masses. Since the establishment the college is multi faculty, including Arts, Commerce and Science now, the college offers the undergraduate courses in B.A., B.Com. and B.Sc. However, only Arts and Commerce faculties are grant in aid basis while B.Sc. is on permanent non grant basis.

The college, right from its inception has shown academic excellence and students have won meritorious awards and have maintained top ranks in the university examinations as well as in extra-curricular activities. Total Student strength of college is 585. College has total 15 teaching staff and 8 non-teaching staff. College has highly qualified staff.

It is important that the college has Specious Classrooms, well developed Laboratories, NSS, Playground etc. Various indoor and outdoor games are conducted by college.

The college is bound to provide quality higher education to the society and economically backward community in the rural, drought prone and earthquake affected area and tries to bring them in to the main stream of higher education. The college has Y.C.M.O.U. study Center which helps to cater the needs of students who are deprive of education.

The college has also adopted the 'Green Campus' system for environmental conservation and sustainability. The goal is to reduce CO_2 emission, water use while creating an atmosphere where students can learn and be healthy.

6.0 AUDIT OBJECTIVES AND SCOPE

The main objective of the green 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. The main objectives of carrying out Green Audit are:

- To introduce and aware students to real concerns of environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- Developing an environmental ethic and value systems in young people.
- Improving environmental standards.
- Benchmarking for environmental protection initiatives.
- Enhancement of College profile.

7.0 EXECUTIVE SUMMARY

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institute which will lead for sustainable development.

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes out-dated unless there is some mechanism in place to continue the effort of monitoring environmental compliance.

Shankarrao Jawale Patil Mahavidyalaya already done internal green assessment and annual reports published for continual improvements; QS Programme and doing their bid towards environmental protection and environmental awareness at local and global front.

The methodology include: preparation and filling up of questionnaire, 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 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity.

This audit report contains observations, appreciations and recommendations for improvement of environmental consciousness.

8.0 METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, 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:

- Waste Management
- Energy Conservation
- Water Conservation
- Green area management/biodiversity survey
- Noise, Ventilation and Illumination study
- Best Practices for Environment

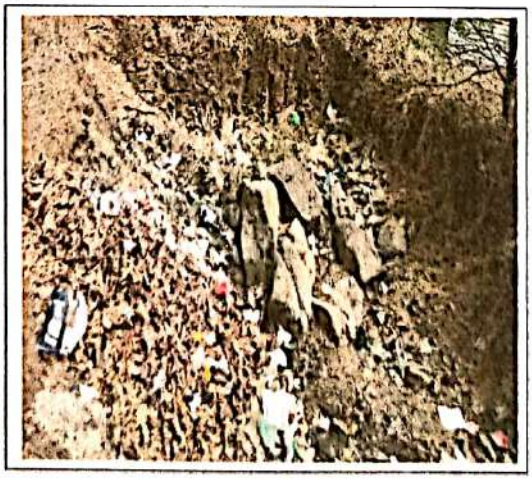
9.0 OBSERVATIONS, APPRECIATIONS AND RECOMMENDATIONS

9.1 WASTE MANAGEMENT

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus. The different solid wastes collected as mentioned above.

A) Observations:

The total organic waste collected in the campus is 2 kg/day. Waste generated from garden is a major solid waste in the campus. Near about 0.5 kg/day of non-biodegradable waste is generated in the campus including glass bottles and 20-25 lit/day chemical waste is generated from laboratories. The waste is not segregated at source by providing separate dustbins for Bio-degradable and Non-Bio-degradable waste. Single sided used papers reused for writing and printing in all departments. Very less plastic waste (0.1 kg/day) is generated by departments, office, garden etc. but it is neither categorized at point source nor sent for recycling. The institute has adopted one composting unit in campus having area 30 sq. feet. The main purpose of this is to breakdown & decomposes all kind of organic waste to create humus, a rich nutrient-filled material called compost. After complete process of composting, it is used as manure in the garden.



Composting Unit

Dustbins are provided in the campus

B) Appreciations:

- Each and every place of campus is provided with dustbin.
- Laboratory waste is collected and given to Nagarpanchayat for proper disposal.

C) Recommendations:

- Provide separate dustbins with colour coding for dry and wet waste.
- Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste with responsibility for recycling clearly allocated.
- Important and confidential papers after their validity to be sent for pulping.
- E-waste should be collected and supplied to E-waste management and disposal facility in order to dispose E-waste in scientific manner.
- Maintenance of composting unit is necessary.

9.2 WATER CONSERVATION

This indicator addresses water consumption, water sources, irrigation, storm water appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

A) Observations:

The study observed that bore well water is main source of water for the campus. Water is used for drinking, canteen, toilets, laboratory and gardening purpose. During the survey, no loss of water is observed, neither by any leakages or by over flow of water from overhead tanks. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 2,500 L/day, which include 1,000 L/day for domestic purposes, 500 L/day for gardening and 1,000

L/day for different laboratories. College doesn't have any R.O system. The college has not rain water harvesting facility in a campus. Water used for drinking purpose analyzed as per IS 10500:2012 drinking water specification and observed it was potable.

Drinking Water Tank

Water Sample Analysis Report

Sr. No.	Parameters	Results	Acceptable Limit as per IS 10500: 2012	Units
1.	Colour	< 1	Max. 5	Hazen Units
2.	Odour	Agreeable	Agreeable	-
3.	pH	7.05	6.5-8.5	-
4.	Turbidity	0.4	Max. 1	N.T.U.
5.	Total Dissolved Solids	90	Max.500	mg/L
6.	Calcium (as Ca)	14	Max.75	mg/L
7.	Chloride (as Cl)	12	Max.250	mg/L
8.	*Floride* (as F)	*< 0.04*	Max.1	mg/L
9.	Iron (as Fe)	<0.05	Max.0.3	mg/L
10.	Magnesium (as Mg)	3	Max. 30	mg/L
11.	Alkalinity (as $CaCO_3$)	25	Max.200	mg/L
12.	Nitrate (as NO_3)	5.18	Max. 45	mglL
13.	Sulphate (as SO_4)	2.85	Max.200	mglL
14.	Total Hardness (as CaCO3)	50	Max.200	mg/L
15.	E. coli	Absent	Not Detectable	/100 ml
16.	Total Coliforms	Absent	Not Detectable	/100 ml

B) Appreciations:

- Water is properly used in the campus and water reusing strategy is followed by the college.

- Waste water generated from campus is collected in soak pit.
- Water wasted from drinking water tank is collected in one pit and it is used for garden.

C) Recommendations:

- Year wise water consumption report.
- Implementation of rain water harvesting system is necessary.
- Implementation of R.O. system is necessary.
- Cleaning and maintenance of drinking water tank is necessary.

9.3 ENERGY CCONSERVATION:

A) Observations:

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

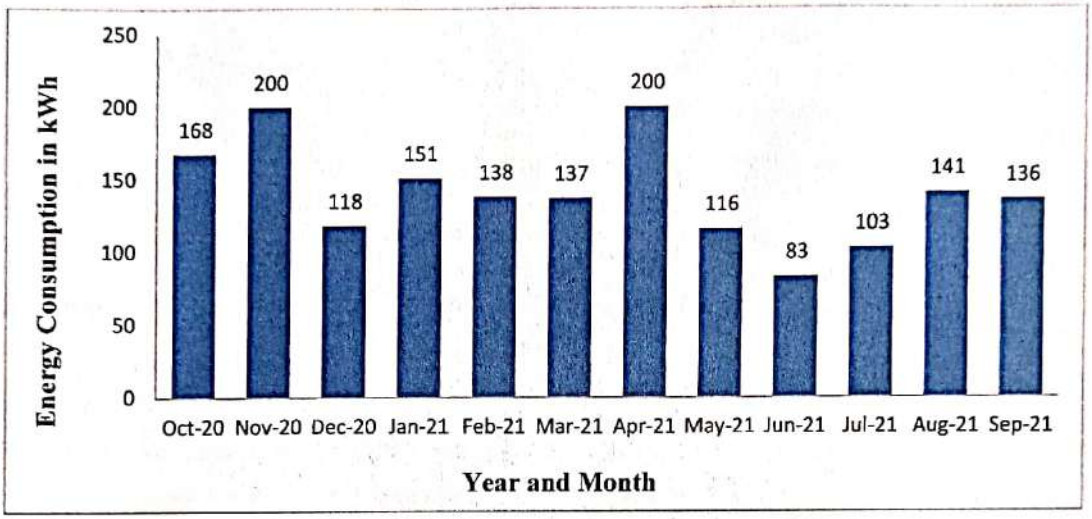
Energy source utilized by all the departments and common facility center is electricity only. Maximum energy consumption is by major energy consuming equipment.

All the departments and common facility centers are equipped with CFL lamps. Approximately 15 computers, 5 printers, 15 bulbs, 5 tubes, 14 fans, and 1 projector these all are observed during the survey. Equipment like Computers is used with power saving mode. Also, campus administration runs switch-off drill on regular basis. In various labs after completion of work, electricity was shut down; it is one of the practices for energy conservation.

The campus imports electricity from Maharashtra State Electricity Distribution Co. Ltd. The total electricity that was imported by the college during the year 2020-21 is as shown below. Total 12 month's energy consumption of the campus is presented below for the year 2020-21. The graph shows that institute requires more electricity and it costs too much. If instate install solar panels then it will saves electricity charges.

Month	Energy Consumption in units
October-20	168
November-20	200
December-20	118
January-21	151
February-21	138
March-21	137
April-21	200
May-21	116
June-21	83

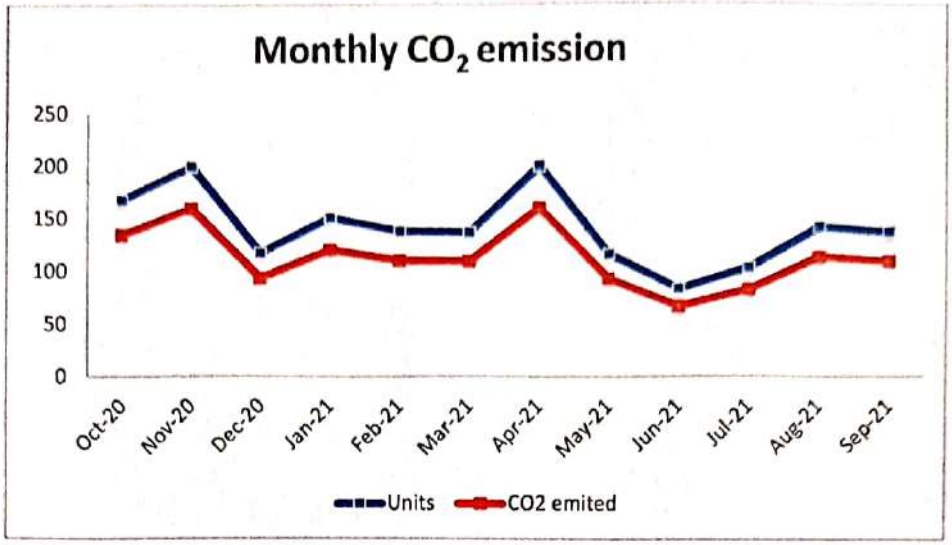
July-21	103
August-21	141
September-21	136
Avg.	140.92



CARBON- DIOXIDE EMISSION

For consumption of 1 Unit (1 kWh) of Electricity, the CO_2 emitted is 0.8 Kg. OR the Emission is 0.8 Kg/kWh. In the following Table we present the total units consumed and CO_2 emitted as under:

Sr.No.	Month	Energy consumption (kWh)	CO_2 emitted in kg
1	October-20	168	134.4
2	November-20	200	160
3	December-20	118	94.4
4	January-21	151	120.8
5	February-21	138	110.4
6	March-21	137	109.6
7	April-21	200	160
8	May-21	116	92.8
9	June-21	83	66.4
10	July-21	103	82.4
11	August-21	141	112.8
12	September-21	136	108.8
	Avg.	140.92	112.7333



B) Appreciations:

- Appreciate that college has installed some LED bulbs.

C) Recommendations:

- Installation of LED lamps instead of CFL is necessary because CFL consumes maximum energy and it is observed that college has maximum CFL lamps.
- Installation of roof top solar panels is necessary.

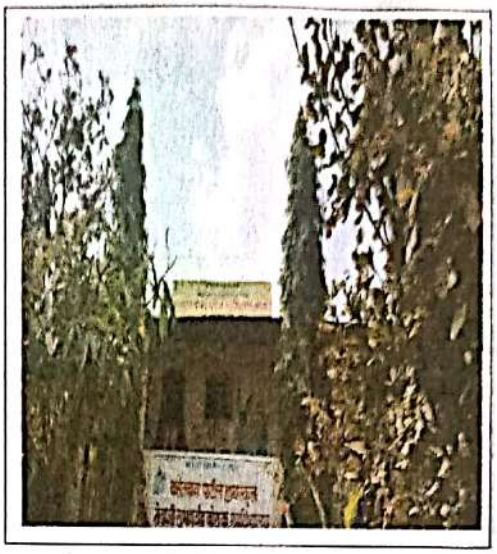
9.4 GREEN AREA MANAGEMENT/BIODIVERSITY SURVEY

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 programs.

A) Observations:

To create- green cover, eco-friendly atmosphere, pure oxygen at the college campus, plantation program is organized every year with involving all students, principal and all departments faculty members.

Campus is located in the vicinity of approximately 70 (species) of trees total no. 263, 20 (species) of shrubs. Approximately 25 species of birds, 5 species of mammals and 4 species of reptiles are found in the campus. Various tree plantation programs are being organized during the month of July and August at college campus and outside the college campus. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among students and staff members. The plantation program includes plantation of various type of indigenous species of ornamental and medicinal as well as wild plant species under the biodiversity and ecological survey. The Institute has a policy of gift a plant to guests in any program. It is a good thing for environment.



Green Campus

B) Appreciations:

- Appreciate that the college has variety of trees, bushes & shrubs.
- Appreciate that college celebrates 5th June as 'Environment Day', every year and plant trees on this day to make the campus Greener.
- Appreciate that college organizes tree plantation drives outside the campus every year.

C) Recommendations:

- Review periodically the list of trees planted in the campus, allot numbers and names to the trees and keep records. Give scientific names to the trees.
- Try to plant more trees in the campus.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects and community services.
- Ensure that an audit is conducted annually. And action is taken on the basis of audit report and recommendation and findings.

9.5 NOISE, VENTILATION AND ILLUINATION MONITORING

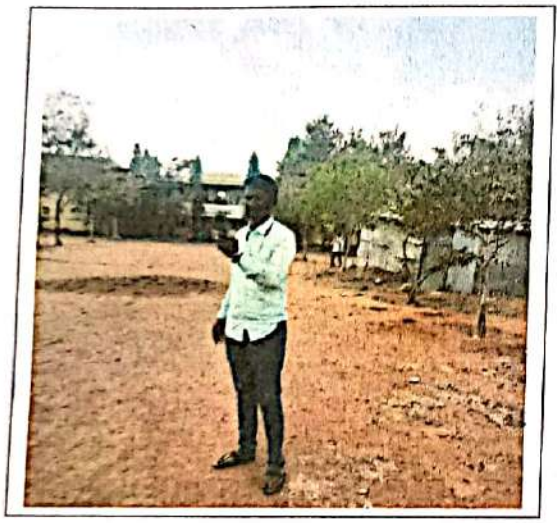
1. Noise Study:

The noise levels measurements were carried out using Noise level meter. The Noise level survey was carried out at two locations, at outside as well inside the study area campus. The major source of noise identified in the study area has been predominantly the vehicular movement and the transportation activities.

Location	Time	1	2	3	4	5	Noise Level Readings dB (A)
Outside	01:55	71	65	69	60	57	64.4
	02:55	69	58	63	55	70	63

Inside	**01:00**	66	54.8	61.2	60	55	59.4
	02:00	61.2	60.8	58	67	59	61.2
As per The Noise Pollution (Regulation & control) Rules, 2000 (Rules 3(1) and 4(1))							

Area Code	Area Type	Limits in dB(A) weighted scale	
		Day (6 a.m. to 10 p.m.)	Night (10 p.m. to 6 a.m.)
B	Commercial	65	55



Noise Level Monitoring Outside the Campus

Noise Level Monitoring Inside the Campus

Observation:

All results of Noise level monitoring (Inside & Outside) found within limits as per the Noise Pollution (Regulation & control) Rules, 2000.

2. Ventilation Study:

The ventilation study was carried out by using anemometer. The study was carried out in classroom.

Sr. No.	Name of Location	Temperature (°c)	Air velocity (m/s)
1.	Classroom	29.2	1.6
2.	Laboratory	29.4	0.5

Ventilation Monitoring in Classroom

Ventilation Monitoring in Laboratory

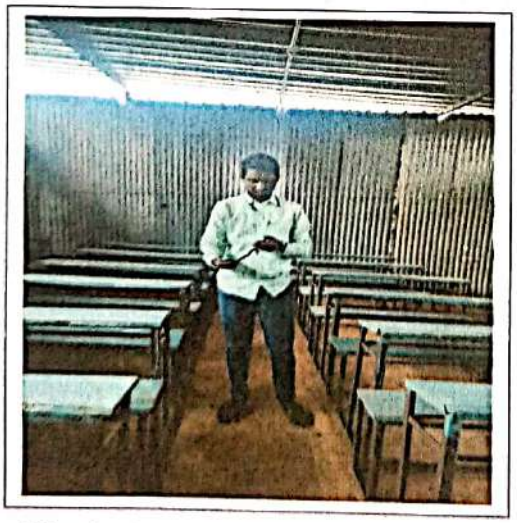
Observation:

All results of ventilation study (classroom & Laboratory) found within limits as per Factory Act 1948, Rule 22-A.

3. Illumination Study:

The Illumination Study was carried out using Lux meter. And it was carried out in classroom.

Sr. No.	Location	Time	Lux Level Reading (LUX)				Average Lux
			1	2	3	4	
1.	Classroom	11:10	158	165	195	215	183.25
2.	Laboratory	10:10	175	140	167	159	160.25



Illumination Monitoring in Classroom

Illumination Monitoring in Laboratory

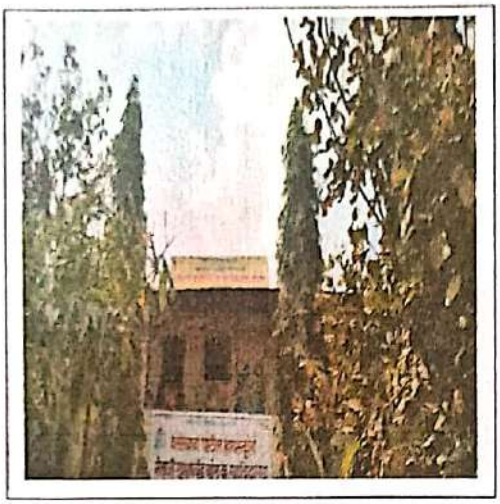
Observation:

All results of Illumination Study (Classroom & Laboratory) found within limits as per MF Rules-Section-35, Schedule B

10. BEST PRACTICES FOR ENVIRONMENT

1. **Biodiversity Conservation:**

- They have green campus which provides habitat to various species.
- They maintain flora and fauna in the campus.

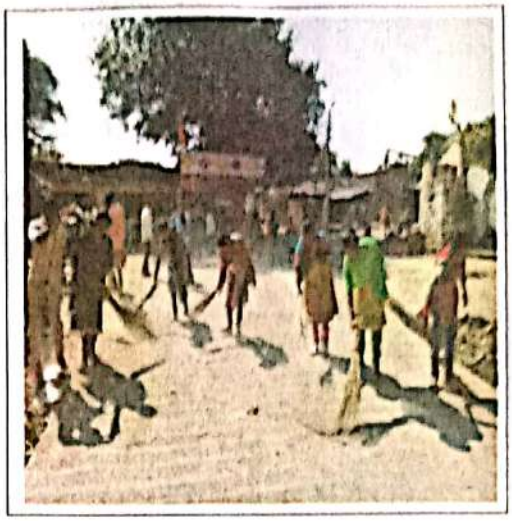


2. **Tree Plantation Drives and Days Celebrations**

- Periodically the plantation drives conducted by students and staff of campus.
- Every Guest is honoredby tree plantation at campus.
- World Environmenta Day, Wetland Day, Ozone Day etc. celebrated by students and staff every year.
- One day National Conference on Environment and Sustainable Development of Rural India: Issues, Problems and Solutions were conducted by college.
- Various workshops on Energy Conservation are conducted by college.

3. Solid Waste Management

- Different mechanisms for proper disposal of biodegradable, non-biodegradable and MSW are implemented in campus.
- Cleanliness drives are arranged by college.



4. **Water Conservation**

- Water saving push taps fitted in the drinking water zone and the toilets to avoid the wastage of water.
- Hand washed water and overflowed water of tank is collected in one ditch. And it is reused for plants.
- Laboratory waste which is chemical free is also reused for plants.

11. OVERALL RECOMMENDATIONS

- Formation of Environment Policy and communicated to all faculties and other staff members.
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Water monitoring) need to be conducted by approved laboratory with frequency of six month.
- Reduction in use of paper work by go digital system.
- Need of installation of roof top solar panels.
- Need to provide separate dustbins in the campus.
- Need of installation of rain water harvesting system.
- Increase in Environmental promotional activities for spreading awareness at campus.
- As practically feasible avoid use of personal vehicles inside the campus.

12. CONCLUSION

This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. Shankarrao Jawale Patil Mahavidyalaya has Environmental Committee for sustainable use of resources. The audit has identified several observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for campus team to initiate actions.

The audit team opines that the overall site is maintained well from environmental perspective. The paperless work system, green campus management, solid waste management, composting unit and water conservation practices are noteworthy.

As part of green audit of campus, we carried out the environmental monitoring of campus which includes Illumination, Noise level, Ventilation monitoring and Water Testing which is used for drinking purpose in the campus. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus is well within the limit i.e. below 65 dB at day time. Drinking water also analyzed and found it was potable.

There are some major observations and they are installation of solar panels, and installation of rain water harvesting system is necessary, providing separate dustbins for solid waste management is necessary. And few minor things are important to initiate urgently are waste management records by monthly inventory, water balance cycle and periodic inspection of buildings housekeeping and environment policy.

I/C. Principal
Shankarrao Jawale Patil Arts,Science &
Commerce College,Lohara Dist.Osmanabad