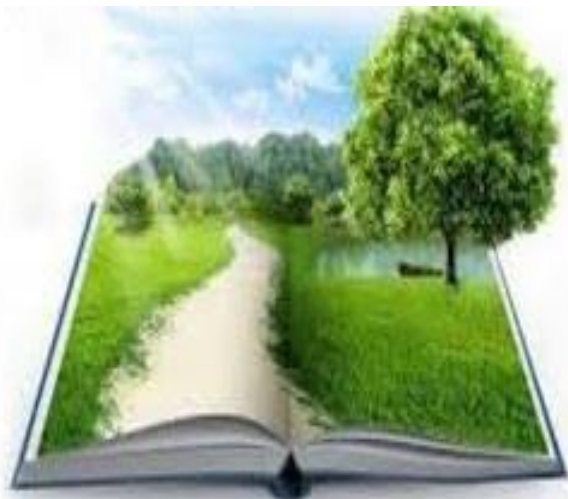


GREEN AUDIT REPORT

(2019-20)

**N.D.M.V.P Samaj's S.V.K.T Arts,
Science & Commerce College,
Deolali Camp, Nashik-422401, Maharashtra**



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College Entry Gate

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.

The Maratha Vidya Prasark Samaj's S.V.K.T. Arts, Science and Commerce College, Deolali Camp (Nashik) is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends.

Being a premier institution of higher learning, the college has initiated 'The Green Campus' program that actively promote the various projects for the environment protection and sustainability.

The purpose of the audit is to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. 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. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student's health and learning college operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

1. Introduction

Green Audit can be defined as systematic identification, quantification, recording, reporting & analysis of components of environmental diversity. The 'Green Audit' aims to analyze 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 organization 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 by 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.

Benefits of the Green Auditing:

- More efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid-waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing and managing
Point out the prevailing and forthcoming complications Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and improving environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the College and its environment
- Enhancement of college profile

- Developing environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

1.1 About the college

The Maratha Vidya Prasark Samaj's S.V.K.T. Arts, Science and Commerce College, Deolali Camp (Nashik) was established in 1984 with an objective to provide an opportunity for higher education to the students of rural area in and around Deolali Camp and wards of defense personals. Initially, the college started only with a few hundred students and currently it educates more than three thousand students. This strength is a testimony to the fact that the college has not only achieved its objective of providing higher education to the students of Deolali and the neighboring areas but also gained a nature of being a College of repute in the area. This was further certified by A grading by the NAAC Committee during 2012.

The college has also adopted the 'Green Campus' system for environmental conservation and sustainability. The goal is to reduce CO₂ emission, energy use and water use, while creating an atmosphere where students can learn and be healthy. The college administration works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity.

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 summarise the present status of environment management in the campus:

- Environment
- Water management
- Energy conservation
- Waste management
- E-waste management
- Green area management

2) Environment Auditing

A) 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.



High Volume Sampler for ambient Air Monitoring

Test Report

Meteorological Data / Environmental Conditions				
Average Wind Velocity: 3.0 km/h	Wind Direction: E	Relative Humidity (Max./Min.): 73/65 %	Temperature (Max./Min.): 26/18°C	Duration of Survey: 24 h
Parameter		Results	NAAQS 2009	Unit
Sulphur Dioxide (SO ₂)		17	80	µg/m ³
Nitrogen Dioxide (NO ₂)		20	80	µg/m ³
Particulate Matter (size less than 10 µm) or PM ₁₀		64	100	µg/m ³
Particulate Matter (size less than 2.5µm) or PM _{2.5}		24	60	µg/m ³
Ozone (O ₃)		<19.6	180	µg/m ³
Lead (Pb)		<0.02	1	µg/m ³
Carbon Monoxide (CO)		0.61	4	mg/m ³
Ammonia (NH ₃)		<4	400	µg/m ³
Benzene (C ₆ H ₆)		<1	5	µg/m ³
Benzo (a) Pyrene (BaP)- particulate phase only		<0.2	1	ng/m ³
Arsenic (As)		<0.3	6	ng/m ³
Nickel (Ni)		<3	20	ng/m ³

Observation: All results of Ambient Air monitoring (Near Main Gate) found within limits as per National Ambient Air Quality Standards, 2009.

B) Noise Environment: 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	11.00	55	50	57	56	55	54.6
	11.30	56	51	54	53	55	53.8
Inside	12.30	52	51	51	50	49	50.6
	13.30	48	52	50	53	50	50.6
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.)
C	Residential	52.4	45



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

C) Illumination Study: The Illumination Study were carried out using Lux meter. The Illumination Study was carried out at two locations, in Classroom & Laboratory.



Sr. No.	Location	Time	Lux Level Reading (LUX)				Average LUX
			1	2	3	4	
1.	Classroom	12:00	570	578	590	570	577
2.	Laboratory	12:30	580	550	520	528	544.5

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

D) Ventilation Study: The ventilation study was carried out by using anemometer. The ventilation study was carried out at two locations, in classroom and in laboratory.

Sr. No.	Name of Location	Temperature (°C)	Relative Humidity (%)	Air velocity (m/s)
1.	Classroom	26.6	26.4	0.7
2.	Laboratory	26	26	0.9



E) Workplace Monitoring: The Workplace Monitoring study was carried out by using Low Volume sampler. The Workplace Monitoring study was carried out at classroom.

Observations: The Workplace Monitoring study was carried out in Classroom. It was observed that all parameters are within limits.



Parameters	Result	Limits as Per OSHA	Unit
Suspended Particulate Matter (SPM)	0.42	15	mg/m ³
Sulphur Dioxide (SO ₂)	0.11	13	mg/m ³
Nitrogen Dioxide (NO ₂)	0.09	9	mg/m ³

3.0) Water

The purpose of a water audit report is to provide an assessment of current water usage practices, and provide a roadmap towards decreasing water usage in the future. Water audit is an assessment of how much water is used and how much water can be saved in the college. Conducting a water audit involves calculating water use and identifying simple ways for saving water in the college. There is an increasing awareness around the globe of the centrality of water to our lives. This awareness crosses political and social boundaries. In many places people have difficult access to drinking water. Often it is polluted. Water auditing is a mechanism for conserving water, which will grow in significance in the future as demand for water increases. There is a strong emphasis on principles, and on the relationship of water auditing with associated activities like environmental auditing, environmental management systems, resource conservation, flow measurement, water quality and legal frameworks

Water audits provide a way to catalog all water uses in a facility and identify ways to increase water use efficiency. The results can help to prioritize steps to implement cost-effective water-saving measures. It is possible to cut the water usage by as much as 30 percent by implementing simple conservation measures and without drastically modifying the lifestyle.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

a) Observations

Water tank is the only source of water. Water is used for drinking purpose, canteen, toilets, laboratory and gardening. During the survey, no loss of water is observed, neither by any leakages, nor 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 3,000 L/day, which include 2,000 L/day for domestic purposes, and 1,000 L/day for different laboratories. To prevent wastage, push button taps are installed in most of the places of common usage. College has also installed a rain water harvesting unit for storing and reuse of rain water.



RO Plant

Water Analysis Report

Sr. No.	Parameters	Results	Acceptable Limit as per IS 10500: 2012	Units
3.	pH	7.02	6.5-8.5	-
4.	Turbidity	0.5	Max. 1	N.T.U.
5.	Total Dissolved Solids	72	Max. 500	mg/L
6.	Calcium (as Ca)	8	Max. 75	mg/L
7.	Chloride (as Cl)	12	Max. 250	mg/L
8.	Fluoride (as F)	<0.05	Max. 1	mg/L
9.	Iron (as Fe)	<0.06	Max. 0.3	mg/L
10.	Magnesium (as Mg)	2.88	Max. 30	mg/L
11.	Nitrate (as NO ₃)	5.12	Max. 45	mg/L
12.	Sulphate (as SO ₄)	2.90	Max. 200	mg/L
13.	Alkalinity (as CaCO ₃)	18	Max. 200	mg/L
14.	Total Hardness (as CaCO ₃)	32	Max. 200	mg/L
15.	<i>E. coli</i>	Absent	Not Detectable	/100 ml
16.	Total Coliforms	Absent	Not Detectable	/100 ml

Note : The Water Sample complies with Acceptable Limit as per 15 10500:2012

b) Recommendations

- Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged.
- There is need of water consumption monitoring system in the college campus
- Establish waste water treatment for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms.
- Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage, are regularly serviced, and the wastage of water is not below the industry average for such equipment's used in similar capacity.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Install display boards to control over use of water.

4.0 Energy Use and Conservation

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.

a) Observations

Energy source utilized by all the departments and common facility center is electricity only. Total energy consumption is determined as 59014 KWH/Year by major energy consuming equipment's.

College has installed Roof Top Solar system of 48 panel with capacity of 15.3 KW in the month of April-2018. The Solar generated energy is utilized in college and excess energy is exported to Maharashtra State Electricity Distribution Board, Nashik which is cost benefited to the college.

All the departments and common facility centres are equipped with CFL lamps. Approximately 150 CFLs (Capacity) were counted during survey. Also college building built-up accordance with open space to entry more sunlight and air, to minimize electricity consumption. Besides this, the college administration has

installed photovoltaic cells in the campus as an alternate renewable source of energy. Equipment's like Computers are used with power saving mode. All electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available.



Photovoltaic cells

b) Recommendations

- Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.
- Conduct switch off drills at regular intervals.
- Conduct energy saving drills at regular intervals.
- LED lamps are recommended over CFLs, as it may help in reducing energy consumption, hence electricity bills.



Energy awareness programme

5.0) Waste Generation

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 as mentioned above.



Solid waste given to Deolali cantonment Board



Solid waste given to Deolali

a) Observations

The total solid waste collected in the campus is 3.2Kg/day. Waste generation from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Non-Biodegradable. Segregation of chemical waste generated in Chemistry and Zoology laboratories is also practiced. Very less plastic waste (0.1Kg/day) is generated by some departments, office, garden etc. but it is neither categorized at point source nor sent for recycling. Metal waste and wooden waste is stored and given to authorized Scrap agents for further processing. Few glass bottles are reused in the laboratories.

The institute has adopted vermiculture composting in culture house on 150 sqft. land. The main purpose of this is to reduce disposable waste in the college campus. After complete process of vermicomposting, it is used as manure in the garden and lawns. Awareness program among farmers is also conducted in the village nearby.



b) Recommendations

- Reduce the absolute amount of waste that it produces from college staff offices.
- Make full use of all recycling facilities provided by Municipal Corporation and private suppliers, including glass, cans, white, coloured and brown paper, 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.
- Single sided used papers should be reused for writing and printing in all departments. Also, important and confidential reports/ papers should be sent for pulping and recycling after completion of their preservation period.

6.0) E-Waste Generation

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. These makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.



E-Waste Management

a) Observations

E-waste generated in the campus is very less in quantity. College is using 47 computers, along with 20 printers and 3 Photo copy machines. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E-waste and defective item from computer laboratory is being stored properly. The institution has decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.

b) Recommendations

- Recycle or safely dispose off white goods, computers and electrical appliances.
- Use reusable resources and containers and avoid unnecessary packaging where possible.
- Always purchase recycled resources where these are both suitable and available.

7.0) Green Area

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.

a) Observations

Campus is located in the vicinity of approximately 59 types (species) of trees. Various tree plantation programs are being organized during the month of July and August at college campus and surrounding villages through NSS unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.

College conducting the seminar on biodiversity "National Conference on Conservation of Environment for Human Sustenance" to college staff and student's to create awareness.



c





Green Area of College Camp



Water Reservoir Cleanliness Campaign at Waldevi River



Cleanliness Campaign at Sansari Village



To take a Oath on the occasion of Anti-Tobacco Addiction Day



NSS organized campaign to collect the plastic and people aware to ban plastic use



Tree Plantation Programme on the occasion of World Environment Day

b) Recommendations

- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as 'Environment Day' and plant trees on the day to make the campus greener.



NSS department organize Tree Plantation Programme

5. Conclusions

Considering the fact that the institution is predominantly an undergraduate college, there is significant environmental awareness both by faculty and students and initiatives taken by them are substantial. The installation of paperless work system and vermicomposting practices are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going to be a green. Few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques.

As part of green audit of campus, we carried out the environmental monitoring of campus includes Illumination, Noise level, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus well within the limit i.e. below 50 dB at day time.

6. Acknowledgement

We are grateful to the committee members of Maratha Vidya Prasark Samaj's S.V.K.T. Arts, Science and Commerce College, Deolali Camp (Nashik), to award this prestigious project and allowed us to enter the new era of Green Audit in the College Campus.

Further we sincerely thank the college staff for providing us necessary facilities and co-operation during the audit. This helped us in making the audit, a success.

Further we hope, this will boost the new generation to take care of Environment and propagate these views for many generations to come.

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FOR ASHWAMEDH ENGINEERS & CONSULTANTS



Chandrakant Handge

AUTHORISED SIGNATORY