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**Jr. College Index No. J 22.04.002**

## Criterion-VII: Institutional Values & Best Practices


### Indicator 7.2 Best Practices

#### 7.1.3 Audits

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-PRINCIPAL  
Padmabhushan Vasantrodada Patil  
Mahavidyalaya, K. Mahankal, Dist. Sangli



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## Green Audit Certificate

This is to certify that the Sahyagiri Enterprises has conducted detailed green audit report of **Padmabhushan Vasantrodada Patil Mahavidyalaya** during academic year 2020-2021 to assess the green initiative planning, efforts, activities implemented in college campus like plantation, water management, waste management, rain water harvesting, energy management, 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

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# GREEN AUDIT REPORT (2020-2021)

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*Shikshan Prasarak Sanstha's*

**PADMABHUSHAN VASANTRAODADA PATIL  
MAHAVIDYALAYA, KAVATHE MAHANKAL**



**Prepared By**



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**Report by: Mayuri M. Jadhav**

## 3.0 CONCEPT

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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

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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

Padmabhushan Vasantrodada Patil Mahavidyalaya was established in 1978 in Kavathe Mahankal tahsil which is drought prone area. Most of the students come from rural area with economical backward, family background. This college is Affiliated to Shivaji University Kolhapur. Institute has 11 Acre campus area. Founder Chairman Mr. Anandraodada Shinde took lots of efforts to build this institute for the rural area students.

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. Padmabhushan Vasantrodada Patil Mahavidyalaya is having graduate departments of full-fledged Arts, Commerce and Science. Total Student strength of college is 1820. College has total 46 teaching staff and 33 non-teaching staff. College has highly qualified staff and well equipped laboratories.

The infrastructure of a college plays a vital role in the development of the college as the students are now focusing on the labs, class rooms, etc. while selecting a college. It is important that the college has very good infrastructure with ICT Based Classrooms, Classrooms with White Board, Spacious Computer Labs, I.Q.A.C Department, N.S.S. Office, Separate Canteen, Indoor Sport Hall, Playground and Store Rooms etc. College has huge playground. Various indoor and outdoor games are conducted by college.

The college has also adopted the 'Green Campus' system for environmental conservation and sustainability. The goal is to reduce CO<sub>2</sub> emission, water use while creating an atmosphere where students can learn and be healthy.



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## 6.0 AUDIT OBJECTIVES AND SCOPE

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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

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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.

Padmabhushan Vasantodada 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

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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

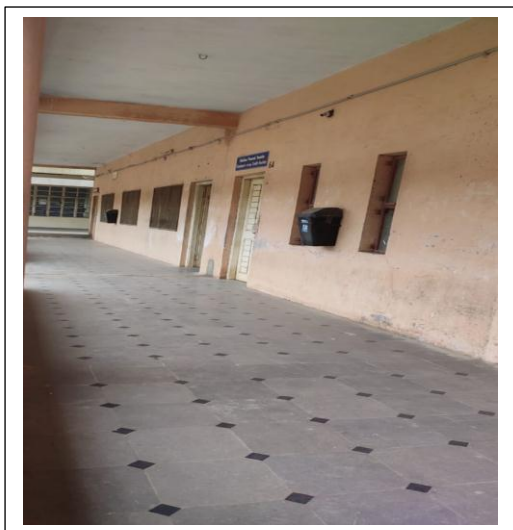
This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, 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 4 kg/day. Waste generated from canteen and garden is a major solid waste in the campus. Near about 1 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 food waste from canteen is sent for composting. The institute has adopted one composting unit in campus having area 3 square meters. 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**



**Campus is well equipped with small dustbins**



**Dustbins are provided in the campus**

### **B) Appreciations:**

- Each and every place of campus is provided with dustbin.
- E-waste is collected and supplied to E-waste management and disposal facility in order to dispose E-waste in scientific manner.

### **C) Recommendations:**

- Provide separate dustbins with colour coding for dry and wet waste.
- Proper system should be provided for laboratory 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.

## **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 sources of water for the campus. Water is used for drinking, canteen, toilets, laboratory and gardening purpose. During the survey, loss of water is observed by leakages only and not 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 5,000 L/day, which include 1,000 L/day for domestic purposes, 3,000 L/day for gardening and 1,000 L/day for different laboratories. Each department has small R.O system. The college has rain water harvesting facility in a campus, and the water from the tank is used for laboratory purpose. So, the College has saved approximately 4000 lit water per year. The total amount of water consumption is reduced by this facility. Water used for drinking purpose analyzed as per IS 10500:2012 drinking water specification and observed it was potable.



**R.O. System**



**Reuse of R.O. rejected water**



**Rain Water Harvesting System**

## 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	7.06	6.5-8.5	-
4.	Turbidity	0.6	Max. 1	N.T.U.
5.	Total Dissolved Solids	100	Max.500	mg/L
6.	Calcium (as Ca)	18	Max.75	mg/L
7.	Chloride (as Cl)	21	Max.250	mg/L
8.	Magnesium (as Mg)	5	Max. 30	mg/L
9.	Alkalinity (as CaCO <sub>3</sub> )	28	Max.200	mg/L
10.	Total Hardness (as CaCO <sub>3</sub> )	54	Max.200	mg/L
11.	E. coli	Absent	Not Detectable	/100 ml

**B) Appreciations:**

- Water is properly used in the campus and water reusing strategy is followed by the college.
- Campus has department wise small R.O. system for drinking water.
- R.O. reject water is reused for gardening purpose.
- Rain water harvesting is properly managed by collecting rain water from roof top of college and it is used for laboratory purpose.

**C) Recommendations:**

- Installation of commercial R.O. system for students in campus is necessary.
- Year wise water consumption report.
- Provide proper waste water treatment in the campus.

**9.3 ENERGY CONSERVATION:****A) Observations:**

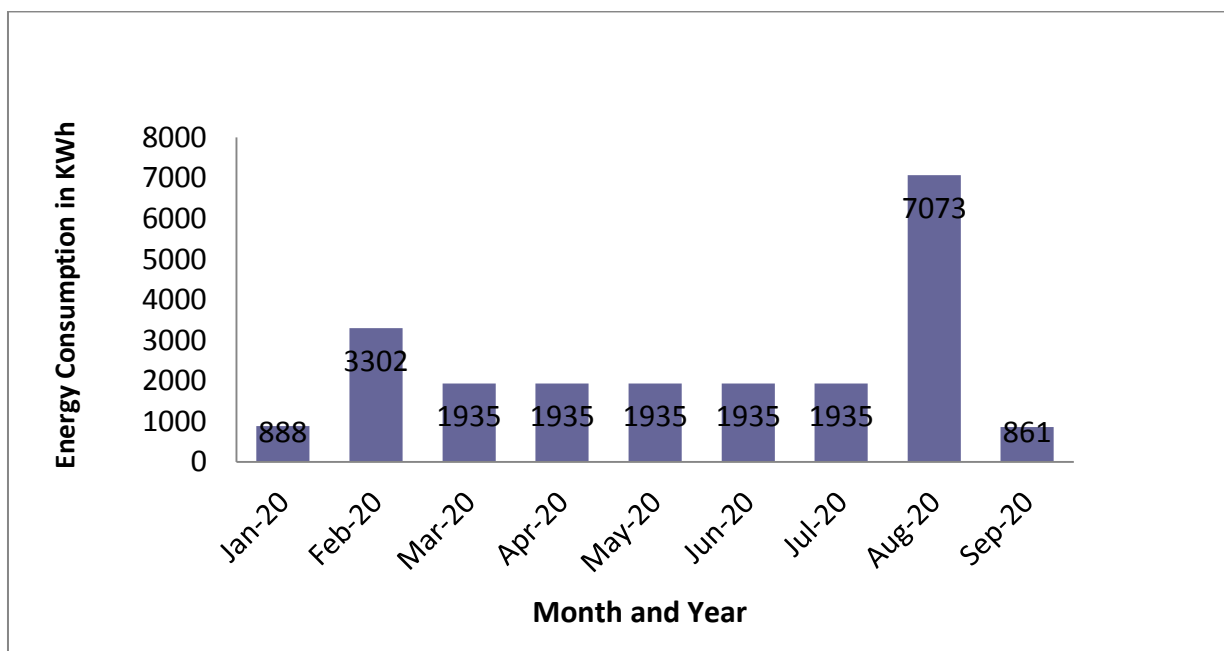
This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Energy source utilized by all the departments and common facility center is electricity only. Maximum energy consumption is by major energy consuming equipment. College hostel has solar water heater.

All the departments and common facility centers are equipped with CFL lamps. Approximately 85 computers, 10 printers, 02 bulbs, 210 tubes, 71 fans and 6 projectors 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.

The campus imports electricity from Maharashtra State Electricity Distribution Co. Ltd. The total electricity that was imported by the college during the year 2020 is as shown below. Total 9 month's energy consumption of the campus is presented below for the year 2021. The graph shows that institute requires more electricity and it costs too much. If instate install solar panels then it will saves electricity charges.



#### **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 15 (species) of trees, 31 (species) of shrubs, 34 (species) of herbs and 7 (species) of aquatic plants. Approximately 15 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 well developed Botanical Garden, Oxygen Park, Garden and lawns.
- Appreciate that the college has variety of trees, bushes, shrubs, herbs and aquatic plants.

- Appreciate that college celebrates 5th June as ‘Environment Day’, every year and plant trees on this day to make the campus Greener.

**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	11:25	58	54	60	61	65	59.6
	12:25	60	62	65	60	59	61.2
Inside	01:15	55	60	62	57	66	60
	02:15	60	55	70	58	67	62

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

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	23	0.4

**Observation:**

All results of ventilation study (classroom) 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	12:30	300	310	315	298	305.75

**Observation:**

All results of Illumination Study (Classroom) 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

- ♣ Periodically the plantation drives conducted by students and staff of campus.
- ♣ Every Guest is honored by tree plantation at campus.
- ♣ World Environmental Day, Wetland Day, Ozone Day etc. Celebrated by students and staff every year.



### 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.
- ♣ Drip irrigation system is applied through the campus for watering plants, and it saves water.
- ♣ Rain water is collected through small canals around the campus which increases the underground water level.



## 11. OVERALL RECOMENDATIONS

- Formation of Environment Policy and communicated to all faculties and other staff members.
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Monitoring of DG set, 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.
- 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. The Padmabhushan Vasantodada 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 rain water harvesting these 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 commercial R.O system in campus is necessary, laboratory waste management is necessary, wastewater treatment 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.





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**Report by: Mayuri M. Jadhav**

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## 3.0 CONCEPT

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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

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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

Padmabhushan Vasantrodada Patil Mahavidyalaya was established in 1978 in Kavathe Mahankal tahsil which is drought prone area. Most of the students come from rural area with economical backward, family background. This college is Affiliated to Shivaji University Kolhapur. Institute has 11 Acre campus area. Founder Chairman Mr. Anandraodada Shinde took lots of efforts to build this institute for the rural area students.

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. Padmabhushan Vasantrodada Patil Mahavidyalaya is having graduate departments of full-fledged Arts, Commerce and Science. Total Student strength of college is 1820. College has total 46 teaching staff and 33 non-teaching staff. College has highly qualified staff and well equipped laboratories.

The infrastructure of a college plays a vital role in the development of the college as the students are now focusing on the labs, class rooms, etc. while selecting a college. It is important that the college has very good infrastructure with ICT Based Classrooms, Classrooms with White Board, Spacious Computer Labs, I.Q.A.C Department, N.S.S. Office, Separate Canteen, Indoor Sport Hall, Playground and Store Rooms etc. College has huge playground. Various indoor and outdoor games are conducted by college.

The college has also adopted the 'Green Campus' system for environmental conservation and sustainability. The goal is to reduce CO<sub>2</sub> emission, water use while creating an atmosphere where students can learn and be healthy.



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## 6.0 AUDIT OBJECTIVES AND SCOPE

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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

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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.

Padmabhushan Vasantodada 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

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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 4 kg/day. Waste generated from canteen and garden is a major solid waste in the campus. Near about 1 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 food waste from canteen is sent for composting. The institute has adopted one composting unit in campus having area 3 square meters. 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**



**Campus is well equipped with small dustbins**



**Dustbins are provided in the campus**

### **B) Appreciations:**

- Each and every place of campus is provided with dustbin.
- Laboratory waste is properly disposed.
- E-waste is collected and supplied to E-waste management and disposal facility in order to dispose E-waste in scientific manner.

### **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.

## **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.

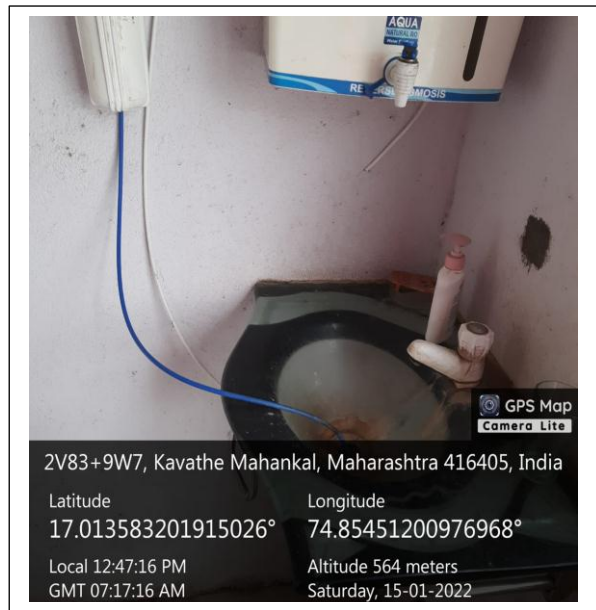
### **A) Observations:**

The study observed that Bore Well water is main sources 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 5,000 L/day, which include 1,000 L/day for domestic purposes, 3,000 L/day for gardening and 1,000 L/day for different laboratories. Each department has small R.O system. The college has rain water harvesting facility in a campus, and the water from the tank is used for laboratory purpose. So, the College has saved approximately 4000 lit water per year. The total amount of water consumption is reduced by this facility. Water used for drinking purpose analyzed as per IS 10500:2012 drinking water specification and observed it was potable.



**R.O. System**



**Reuse of R.O. rejected water**



**Rain Water Harvesting System**

## 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	7.08	6.5-8.5	-
4.	Turbidity	0.5	Max. 1	N.T.U.
5.	Total Dissolved Solids	90	Max.500	mg/L
6.	Calcium (as Ca)	15	Max.75	mg/L
7.	Chloride (as Cl)	18	Max.250	mg/L
8.	Magnesium (as Mg)	3	Max. 30	mg/L
9.	Alkalinity (as CaCO <sub>3</sub> )	25	Max.200	mg/L
10.	Total Hardness (as CaCO <sub>3</sub> )	50	Max.200	mg/L
11.	E. coli	Absent	Not Detectable	/100 ml

**B) Appreciations:**

- Water is properly used in the campus and water reusing strategy is followed by the college.
- Campus has department wise small R.O. system for drinking water.
- R.O. reject water is reused for gardening purpose.
- Rain water harvesting is properly managed by collecting rain water from roof top of college and it is used for laboratory purpose.
- Only one septic tank is constructed in campus for waste water treatment.

**C) Recommendations:**

- Installation of commercial R.O. system for students in campus is necessary.
- Year wise water consumption report.
- Provide proper waste water treatment in the campus wherever necessary.

**9.3 ENERGY CONSERVATION:****A) Observations:**

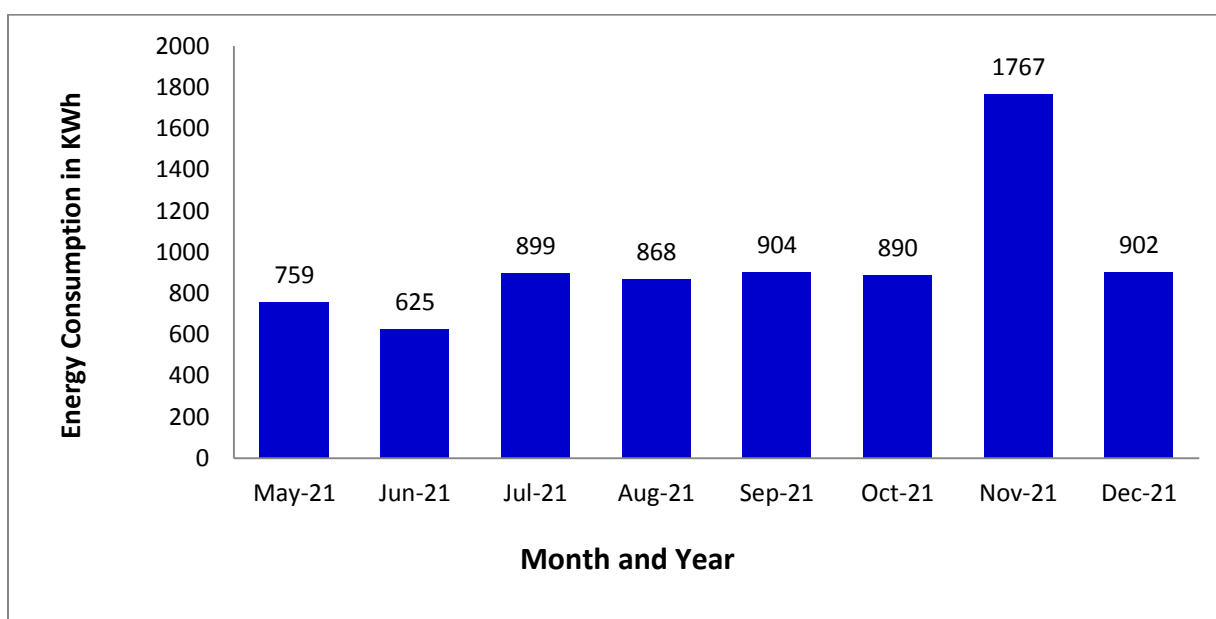
This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Energy source utilized by all the departments and common facility center is electricity only. Maximum energy consumption is by major energy consuming equipment. College hostel has solar water heater.

All the departments and common facility centers are equipped with CFL lamps. Approximately 85

computers, 10 printers, 02 bulbs, 210 tubes, 71 fans and 6 projectors 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.

The campus imports electricity from Maharashtra State Electricity Distribution Co. Ltd. The total electricity that was imported by the college during the year 2021 is as shown below. Total 8 month's energy consumption of the campus is presented below for the year 2021. The graph shows that institute requires more electricity and it costs too much. If instate install solar panels then it will saves electricity charges.



#### **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**

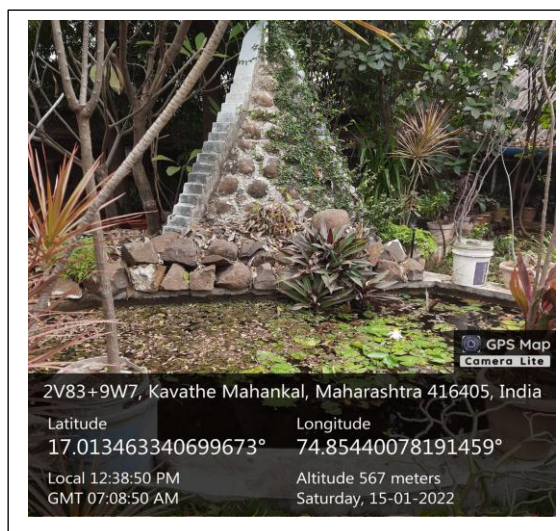
This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programs.

##### **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 15 (species) of trees, 31 (species) of shrubs, 34 (species) of herbs and 7 (species) of aquatic plants. Approximately 15 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 well developed Botanical Garden, Oxygen Park, Garden and lawns.
- Appreciate that the college has variety of trees, bushes, shrubs, herbs and aquatic plants.

- Appreciate that college celebrates 5th June as ‘Environment Day’, every year and plant trees on this day to make the campus Greener.

**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**

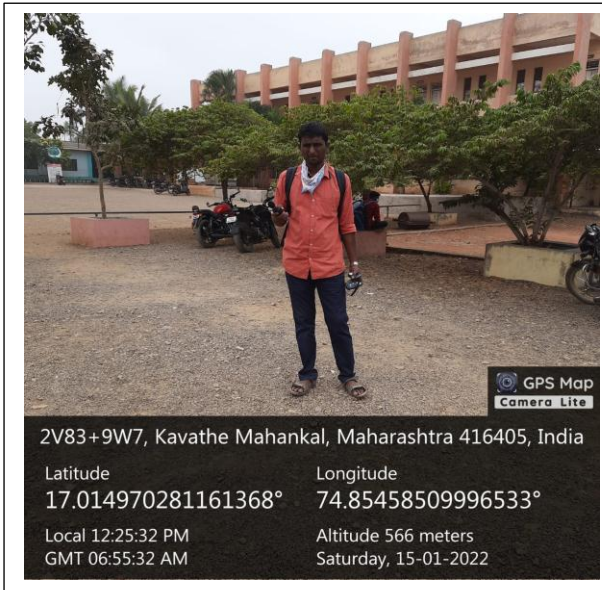
**1. Noise Study:**

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.

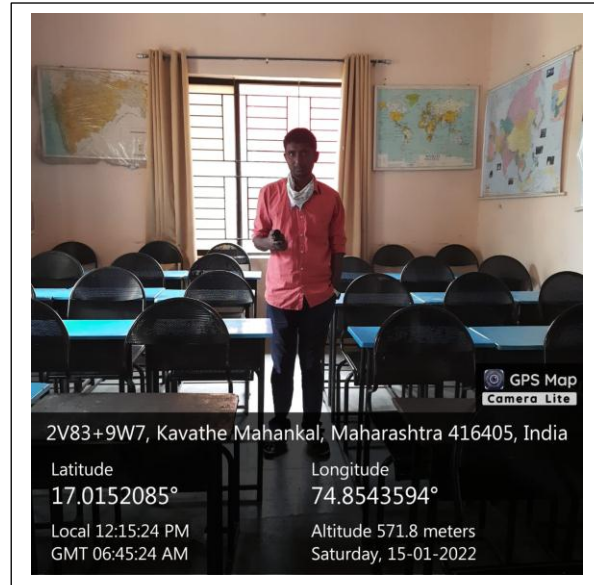
Location	Time	1	2	3	4	5	Noise Level Readings dB (A)
Outside	12:25	65	55	60	62	58	60
	01:25	68	62	58	57	65	62
Inside	11:15	58	60	55	55	62	58
	12:15	55	60	68	55	67	61

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**

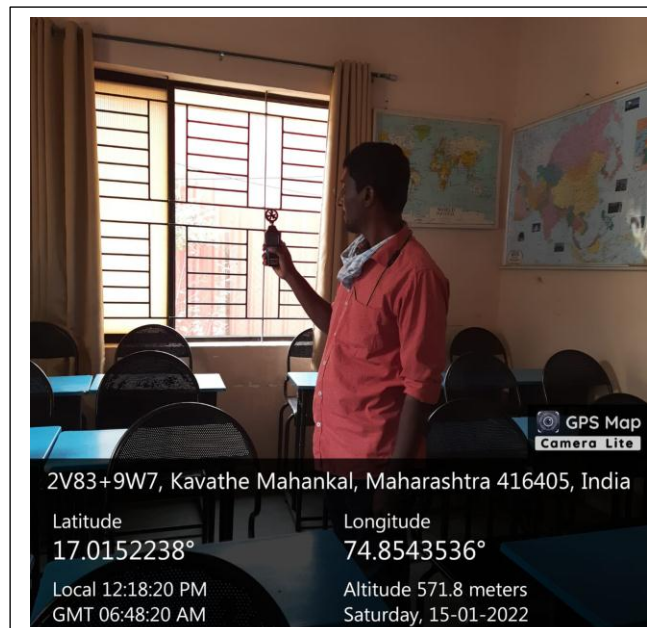
**Observation:**

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	22.8	0.3



**Ventilation Monitoring in Classroom**

**Observation:**

All results of ventilation study (classroom) 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	12:20	295	305	315	300	303.75

**Illumination Monitoring in Classroom****Observation:**

All results of Illumination Study (Classroom) 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

- ♣ Periodically the plantation drives conducted by students and staff of campus.
- ♣ Every Guest is honored by tree plantation at campus.
- ♣ World Environmental Day, Wetland Day, Ozone Day etc. Celebrated by students and staff every year.



### 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.
- ♣ Drip irrigation system is applied through the campus for watering plants, and it saves water.
- ♣ Rain water is collected through small canals around the campus which increases the underground water level.



## 11. OVERALL RECOMENDATIONS

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- Formation of Environment Policy and communicated to all faculties and other staff members.
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Monitoring of DG set, 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.
- 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. The Padmabhusan Vasantodada 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, implementation of drip irrigation system, solid waste management, composting unit and rain water harvesting these 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 commercial R.O system, waste water treatment in campus 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.



# Green Audit Certificate (As per Green Building Parameters)

The study is conducted as per Indian and International Green Building Standards initiated in the capacity of an Accredited & Certified Green Building Professional

It is awarded for **2021-2022 and 2022-2023** to the Esteemed Institution

(Analysed for 2 years and extended validity for 1 year, thus total 3 years)

Shikshan Prasarak Sanstha's

## P. V. P. Mahavidyalaya Kavathe Mahankal

Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal, Dist-Sangli Pin-416405, Maharashtra, India

(Site visit held on Monday, 22 May 2023)

As part of the Institution's initiatives for a Healthy & Sustainable Institute the audit was conducted. We appreciate the immense efforts taken by Staff and students towards the Efficient Management of Premise.

Issued on **Monday, 22 May 2023** and valid till **30 April 2024**

  
**Ar. Nahida Abdulla Shaikh**

"Elite 100 Green Architects of India" Econaur, 2022

Registered Architect, P.G.D.R.D, ISO Certified I. A. (IMS)

Indian Green Building Council Accredited Professional (IGBC AP)

ASSOCHAM GEM Green Building Council Certified Professional (Registration. No. 22/718)

**Project Head and Green Building Professional-Consultant**

Sustainable Academe I Sustainability Department of Greenvio Solutions, Naigaon

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Website: <https://thegreenviosolutions.co.in/>

# GREEN AUDIT

STUDY PERIOD (TWO YEARS) 2021 – 2022 & 2022 - 2023

Sustainability study  
**AUDIT REPORT**

Studied for  
Shikshan Prasarak Sanstha's  
**P. V. P. Mahavidyalaya**  
**Kvathe Mahankal**

Vidyanagar, Kvathe Mahankal Tal-Kvathe Mahankal,  
Dist-Sangli Pin-416405, Maharashtra, India

Studied in the capacity of  
Accredited and Certified  
Green Building Professional



Website: <https://thegreenviosolutions.co.in/>

Email: [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)

Valid till **April 2024**

Background reference image Sasin Tipchai on unsplash

# Disclaimer

The Audit Team has prepared this report for the **Shikshan Prasarak Sanstha's P.V.P.Mahavidyalaya Kavathe Mahankal** located at Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal, Dist-Sangli Pin-416405, Maharashtra, India based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the Hon'ble Management and College. The warranty or undertaking, expressed 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.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied or regenerated in any form.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

## Greenvio Solutions

*Developing Healthy and Sustainable Environments*

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

Palghar District, Maharashtra- 401208

[sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com)

## Acknowledgement

The Audit Assessment Team thanks the **Shikshan Prasarak Sanstha's P.V.P.Mahavidyalaya Kavathe Mahankal, Maharashtra, India** for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Mr. Balasaheb Aanandrao Shinde**, President; **Mr. Suresh Patil**, Vice President; **Mr. Sudarshan Balasaheb Shinde**, Secretary and everyone from the Management.

Our heartfelt thanks to Chairpersons of the entire process **Prof. (Dr.) M. K. Patil**, Principal for the valuable inputs.

We are also thankful to **College's Task force the Assistant Professors** who have collected data required - **Dr. B. T. Jadhav** and **Prof. Avinash Kamble**.

We highly appreciate the assistance of the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

### **Sustainable Academe**

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

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**Evidence documents for Site visit of external audit team**

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit       Energy audit       Environment audit

**Institute:** Padmabhushan Vasantraodada Patil      **Date:** 22/05/2023  
mahavidyalaya, Kavathe Mahankal,

**Document objective: Inferences of the Site visit**

Observations (Positive aspects)	Suggestions (Improvement aspects)
<b>Green Audit</b>	
- Rainwater harvesting is under practice, and is connected for use in chemistry lab.	- Waste management should be improved for [Plastic, E-waste, Organic & Liquid waste]
<b>Energy Audit</b>	
- Turbo ventilators are used for thermal comfort	- Undertake hybrid mode for alternate sources of energy - Replace with energy efficient lighting.
<b>Environment Audit</b>	
- Improve green cover of premises	- Lot of beautification should be undertaken for New Buildings.

Signature & round seal  
Name: P.V.P. Mahavidyalaya  
Designation: ISAC, Co-ordinator  
**For the said Institute**

Signature & round seal  
Name: Mrs. F. Shikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**



### Evidence documents for Site visit of external audit team

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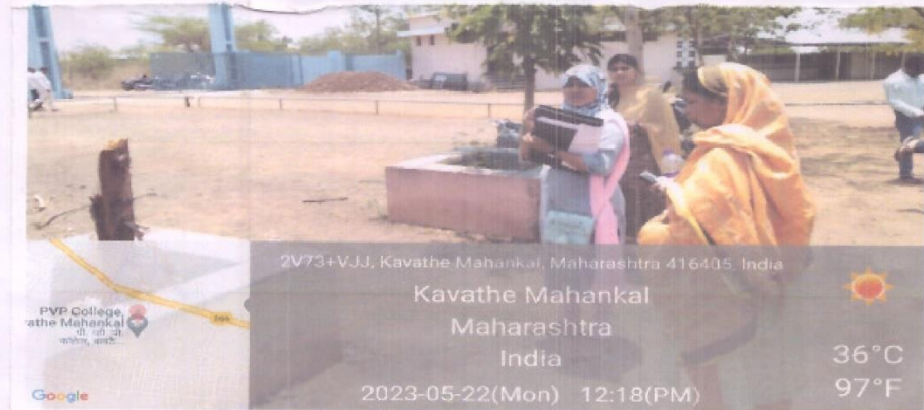
Audits covered:  Green audit  Energy audit  Environment audit

Institute: Padmabhushan Vasanti Radada Patil Mahavidyalaya, Kavathe Mahankal Date: 22/05/2023

Document objective: **Proof of the Site visit**



Meeting with the core team



Investigation of the systems

Signature & round seal  
Name: P.V. Mahavidyalaya  
Designation: Asst. Prof. Co-ordinator  
**For the said Institute**

Signature & round seal  
Name: F.A. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**

# 1. Introduction

## 1.1 About the Institution

This college was established in a drought prone area where most of the students come from rural area with economical background. The College firmly believes that education is incomplete without discipline. The institution is confident in making a wholesome person out of the student only by instilling in him discipline which would go to foster a high degree of righteousness in and around him. Accordingly, a disciplinary committee monitors the discipline of the institution.

## 1.2 Assessment of the Institute

### 1.2.1 Affiliations

The technical course provided by the College is affiliated to **Shivaji University**, established in 1962, a state university located at Kolhapur, Maharashtra, India.

### 1.2.2 Certification

The College submits its academic records every year to the **All India Survey of Higher Education (AISHE)** Govt. of India through its registered allocated code which is C-11026.

### 1.2.3 Recognitions

The College has upgraded in the teaching level – Under graduate to Post graduate in the **section 2(f) and 12 (B) of the University Grants Council Act, 1956 in 1994** with affiliation nos. being 8-131/93 and F.B-131/93 respectively.

## 1.3 Statements of the Institution

### 1.3.1 Vision

The College proposes "Sanstha is committed to meet the education, social, cultural and economic needs of the region and the nation to create a just and human society."

### 1.3.2 Mission

The College adheres and focuses "To promote and foster a culture of high quality teaching and learning and to serve societal needs by encouraging, generating and promoting excellence in research and extension activities."

### 1.3.3 Goals

The College has formulated the following aim to achieve its mission:

- ➔ To make relentless efforts for the spread of education among classes and communities, that are socially and educationally underprivileged.
- ➔ To make special provision and for disseminating knowledge and promoting arts and culture in rural areas.
- ➔ To supervise and control the conduct and discipline of the students of the P.V.P. Mahavidyalaya and to make arrangements for promoting their health and general welfare.
- ➔ To create a fine band of capable youngsters with great thirst for knowledge and scientific curiosity.
- ➔ To promote the study and research of the Marathi language and the history of Maharashtra.
- ➔ To provide opportunities to the P.V.P. Mahavidyalaya community to reach his/her highest personnel and professional capability.
- ➔ To develop the personality and character of students by value education.

## 2. Overview

### 2.1 Summarised Populace analysis for 2022-2023

#### 2.1.1 Students data

The data (shared by the Institute) shows there were a total of **1,075 male and 653 female students.**

#### 2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Teaching staff	30	06	36
2	Non-Teaching staff	31	01	32
<b>Total Staff Members</b>		<b>61</b>	<b>07</b>	<b>68</b>

*Table 1: Staff data of the Institution for 2022-2023*

The staff data shows the College premises had a total of **68 Staff Members.**

### 2.2 Summarised Populace analysis for 2021-2022

#### 2.2.1 Students data

The data (shared by the Institute) shows there were a total of **1,172 male and 648 female students.**

#### 2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Teaching staff	40	06	46
2	Non-Teaching staff	32	01	33
<b>Total Staff Members</b>		<b>72</b>	<b>07</b>	<b>79</b>

*Table 2: Staff data of the Institution for 2021-2022*

The staff data shows the College premises had a total of **79 Staff Members.**

## **2.3 Total College Area & College Building Spread Area**

The **total site area is 10.32 acres** and the **total Built-up area of the Institute is 34,645 sq. ft.** for an approximately 1,796 footfalls.

## **2.4 Institute Infrastructure**

### **2.4.1 Establishment**

The Institute was established in **1978**.

### **2.4.2 Spatial Organisation**

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc. The Institute is located pretty close to nature and hence has a very fresh environment which is absolutely pollution free and healthy. The Building is a Reinforced Cement Concrete (RCC) framework building.

## 3. Research

### 3.1 About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution sustainable and healthy premises for its inhabitants.

### 3.2 Analysis of the Green Building Study Audit

The procedure included detailed verification as follows:

- Investigation
- Technical discussion with team
- Observations
- Inferences

### 3.3 Strategy adopted for Green Building Study Audit

The strategies included data collection from the admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collection, and preparation of the Report.

### 3.4 Activities undertaken for the Green Building Study Audit

- Discussion with the Institute
- Allotment and Initiation by the Institute
- Data collection
- Submission of the files

### Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit

Institute: Padmabhushan Vasantbhadra Bli Mahavidyalaya, Karanemahapur Date: 21/01/2013

Document objective: Induction Meeting attendance sheet

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Mr. A. A. Kambale	Internal	JGAC. co-coordinator	
4.	Dr. B. T. Jadhav	Internal	chairman, cri. VII	
5.	Mr. S. B. Patil	Internal	member, cri. VII	
6.	Mr. S. M. Sable	Internal	member, cri. VII	
7.	Mrs. P. R. Mali	Internal	member, cri. VII	

Signature & round seal  
Name: P. V. P. Mahavidyalaya  
Designation: JGAC. coordinator  
For the said Institute

Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
For The Greenvio Solutions

**Evidence documents for Site visit of external audit team**

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit       Energy audit       Environment audit

Institute: Radmahabhusen Vasantroodada Patil      Date: 22/05/2017  
Memoridajalga, Kovermemonkol

**Document objective: Exit Meeting attendance sheet**

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Mr. A. A. Kamble	Internal	IGAC, coordinator	
4.	Dr. B. T. Jadhav	Internal	Chairman, crj-VII	
5.	Mr. S. B. Patil	Internal	Member, crj-VII	
6.	Mr. S. M. Sable	Internal	- - -	
7.	Mr. P. R. Mali	Internal	- - -	

Signature & round seal  
Name: P. V. Panahavijalga  
Designation: IGAC, coordinator  
**For the said Institute**

Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**

## 4. Green Practices Audit

The increasing global warming and climate change have made us realise that apart from the enormous strategies the individual small efforts need to be taken by individuals and Educational Institutes as the younger generations are the future of the world and once they are taught about these practices only then can we assume a better future.

### 4.1 Green practices

We observed the following points during the Site investigation and data verification of the premises; these are common for all the Buildings on the premises.

- **Social awareness** - *The College has taken up awareness drives on various social issues for rural upliftment and regeneration in the College and surrounding villages.*
- **Fresh environment** – *The College provides an eco-friendly ambience with fresh air and soothing environment which helps to maintain a physical and mental balance. This kind of a space it a must for an educational specially technical institute which is inviting and gives the stakeholders an opportunity to explore indoor and outdoor learning to a great extent.*
- **Team work** – *The best quality of the College which sets it apart is its coordinating, cooperative staff members; for a building the foundation plays the most important role for its future similarly for an educational institute its staff members do.*

### 4.2 Community development

The College conducts environmental initiatives documented as follows:

S. No.	Name of the event	Particulars	Date
<b>Academic year 1</b>			
1	Bhujal Saksharata din	Awareness of water conservation	09-07-2021
2	Tree Plantation under title of Mazi Vasundhara	Tree Plantation for environmental Awareness	15-07-2021
3	NSS camp	For promotion of different environmental activities	23 to 29/03/2022

4	Commendable River Cleaning		For water conservation and decrease in water pollution	05-06-2022
<b>Academic year 2</b>				
6	<i>Swarajya campus activity</i>	<i>Mahotsav cleaning</i>	To create awareness and importance of cleanliness and hygiene	10-08-2022
7	<i>Swarajya Rally</i>	<i>Mahotsav</i>	To create environment Awareness	18-08-2022
8	<i>NSS camp</i>		For promotion of different environmental activities	22 to 28/02/2023

*Table 3: Details of the events undertaken by the Institute*

### 4.3 Section-wise recommendations related to 'Green practices'

The following suggestions are to be considered as a **first priority** for implementation. These **should be executed within the next 1.5 to 2.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

- ➔ **Plant as a gift** - As a kind gesture, the guests visiting the premise can be asked to plant a small plant on the premise itself and they can be even given plants/bouquets from the flowers of the plants on the premise as a gift.
- ➔ **Environmental awareness** - There can be various artworks on the compound wall giving the message of saving the environment through the joint efforts of the students and staff thereby making the student socially and environmentally responsible citizens.
- ➔ **Documentation** – Improve and increase the documentation and visibility/reflectance of the environment related events on the website, social media handles

## 5. Waste Audit

Waste is an inevitable part of our lives. Over the years the awareness about waste management techniques has given a rise to rethink how the waste can be avoided being sent to the landfills. The audit provides an approximation of the types of waste generated, location of waste collections, disposal techniques used, waste segregation methodologies adopted, and waste management strategies that are implemented in addition to the newer ways that can be adopted aiming to make the premise clean and sustainable.

### 5.1 Waste produced

- **Solid waste management** different bins have been placed at different departments, wings and floors. The institution ensures that solid waste is segregated at the source and properly disposed. It is also ensured that it is deposited to the Municipal Garbage Collection Van on time again and again
- **Organic waste** a vermi compost plant is maintained by botany department
- Liquid wastes generated by College are of two types
  - 1. Sewage waste The above waste is collected in soak pits.
  - 2. Laboratory waste
- The above waste is collected in soak pits.
- **Laboratory waste** generated in separate soak pit in backside of chemistry department
- **Toxic wastes** from laboratories are disposed under the observation of laboratory experts
- Memory chips, mother board, compact disk, cartiges etc. generated by electronic equipments such as computers, phones, printers, fax and photocopy machines are recycled properly. The **E-waste** generated from hardware which cannot be reused or recycled is being disposed of centrally through governments authorized vendors.
- **Plastic** is banned in the institute

## 5.2 Bins summary

There are 9 dustbins inside the premises and 2 in the outdoor areas; these are available in the form of plastic bins.

## 5.3 Section-wise recommendation related to 'waste audit'

The following suggestions are to be considered as a **first priority** for implementation. These **should be executed within the next 1.5 to 2.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

- ➔ **Twin Dual Litter Dustbin Bins** - There should be more number of dual litter dustbins at various locations in areas such as Canteen, and open spaces. This would inculcate the awareness of waste segregation among students.
- ➔ **Signages** - Messages about avoiding wastage should be placed at appropriate locations.
- ➔ **Dustbins at every 100m** - There should be a dustbin at every 50-100 in the open spaces
- ➔ **Material of the dustbin** - The current plastic dustbins should be replaced with eco-friendly material.

## 6. Water Audit

Water is one of the basic needs. Pure drinking water is a resource that needs to be preserved efficiently. A water audit helps to identify the sources of water consumption, and the water requirement by the premises is met by these sources.

### 6.1 Water availability and consumption

#### 6.1.1 Source of Primary water supply

The College requires water from the Local Municipality for drinking water purposes; the details of the same are documented below:

S. No.	Type	Size	Capacity (litres)	Nos.	Location
1	Overhead	5x5x2	45,000	3	Annex, library
2	Fire tank	5 litre	5 litre	5	Chemistry Lab.
3	RO Plant	1,000 litre	1x 100 litre	8	All over the campus
			10x 7 litre		

*Table 4: Details of the water tanks in the premises*

#### 6.1.2 Source of Secondary water supply

The College uses the secondary sources of water supply for general usages such as watering plants, kitchen, toilets, and wash basins connected to the labs and other spaces.

At present, there is one bore well available in the premises as secondary sources of water supply.

#### 6.1.3 Source of Tertiary water supply

The tertiary source of water is the additional source of water harvesting. There are dedicated pits available for rain water harvesting 10x20x5 feet with a capacity of 1,00,000 litres and another pit of capacity 5,000 litres.

#### 6.1.4 Source of Reusing waste water

The initiative is not under practice at present completely only the chemicals are neutralized before letting it down in the drains. We have suggested to under practices of

green chemistry as per discussion to treat the waste water from the laboratories and reused the same after filtering for watering the plants and the trees in the premises.

## 6.2 Areas of water usage

Based on the inventory done and data shared by the staff it was found that the premise has the following facilities:

Particulars	Nos.
General toilet for students	2
General toilet for staff	3
Special Toilet for handicaps 1.5m x 2.5m	1
Urinals	90
Taps in laboratories	59
Taps in wash basins in toilets	18
Taps in Canteen	1
Taps in the garden	4

*Table 5: Details of the water usages in the premises*

As per the data shared by the College and on-site observation, it was noted that there is no water wastage of water in the form of Cleanliness of toilets.

## 6.3 Recommendations for a Sustainable Habitat

The following suggestions are to be considered as a **first priority** for implementation. These **should be executed within the next 1.5 to 2.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

- **Rain water bunds** – There should be landscape beautification project undertaken to appropriate channelize the rain water through bunds and similar facilities.
- **Waterless urinals** - There can be the provision of waterless urinals as a Green Building initiative in the premise, either the existing ones can be replaced with such a facility or new toilets can be constructed in this manner.
- **Signages** - Messages about avoiding water wastage should be placed at appropriate locations.

## 7. Health and Hygiene Audit

The hygiene is a part and parcel of our daily life. It is extremely essential to keep the surroundings clean in the same manner as we would want our houses to be. Educational Institutes have a bigger role to play in order to affect the young minds in the positive manner through better hygienic practices.

### 7.1 Facilities available

The Institution has washroom facility, hand wash, drinking water and dustbin facilities.

### 7.2 Hygiene

- There was no odour issue faced during the investigation.
- The areas of water tanks in site on ground floor are clean

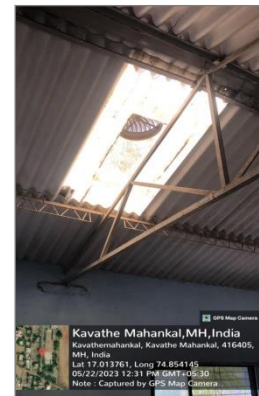
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The following suggestions are to be considered as a **first priority** for implementation. These **should be executed within the next 1.5 to 2.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

- **Courtyards and duct areas** – These are located in the internal and setback should have vertical gardens for beautification.
- **Health related provisions** – There should be provisions for a dedicated health centre and 24x7 available ambulance services inside the premises.
- **Avoid burning waste** - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff
- **Signboards** – The Institute should have multiple signboards about 'No smoking' and 'Healthy premises' at every nook and corner of the Institute.
- **Compound wall** – The compound wall should have awareness messages about 'No Smoking' and 'No Tobacco'



On-site investigation of the Old campus



On-site investigation of the internal spaces



Details about the various types of dustbins and the oxygen park



Rain water harvesting facility in the premises

## 8. Compilation

The study is based on the data collected, analysed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyse and study the data collected.

- ➔ Uniform Plumbing Code – India, 2008
- ➔ IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- ➔ IGBC Green Landscape Rating system, March 2013
- ➔ BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
- ➔ Used only for understanding Universal design - Universal Accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National center for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation and [www.umassd.edu](http://www.umassd.edu)
- ➔ The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- ➔ Images on site by Coordinators of the both teams
- ➔ Icon images used by <https://www.vecteezy.com/free-vector/security-camera-icon> and <https://www.vecteezy.com/free-vector/electric-car-icon>



# Environment Audit Certificate (As per Green Building Parameters)

The study is conducted as per Indian and International Green Building Standards initiated in the capacity of an Accredited & Certified Green Building Professional

It is awarded for **2021-2022 and 2022-2023** to the Esteemed Institution

(Analysed for 2 years and extended validity for 1 year, thus total 3 years)

Shikshan Prasarak Sanstha's

## **P. V. P. Mahavidyalaya Kavathe Mahankal**

Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal, Dist-Sangli Pin-416405, Maharashtra, India

(Site visit held on Monday, 22 May 2023)

As part of the Institution's initiatives for a Healthy & Sustainable Institute the audit was conducted.  
We appreciate the immense efforts taken by Staff and students towards the Environment Protection and Conservation.

Issued on **Monday, 22 May 2023** and valid till **30 April 2024**

  
**Ar. Nahida Abdulla Shaikh**

"Elite 100 Green Architects of India" Econaur, 2022

Registered Architect, P.G.D.R.D, ISO Certified I. A. (IMS)

Indian Green Building Council Accredited Professional (IGBC AP)

ASSOCHAM GEM Green Building Council Certified Professional (Registration. No. 22/718)

**Project Head and Green Building Professional-Consultant**

Sustainable Academe I Sustainability Department of Greenvio Solutions, Naigaon

An environment Design and Consultancy developing Healthy and Sustainable Environments

Email: [sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com) | [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)



Website: <https://thegreenviosolutions.co.in/>

# ENVIRONMENT AUDIT

STUDY PERIOD (TWO YEARS) 2021 – 2022 & 2022 - 2023

Sustainability study  
**AUDIT REPORT**

**Studied for**

Shikshan Prasarak Sanstha's

**P. V. P. Mahavidyalaya  
Kavathe Mahankal**

Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal,  
Dist-Sangli Pin-416405, Maharashtra, India

**Studied in the capacity of**

**Accredited and Certified**  
Green Building Professional



Website: <https://thegreenviosolutions.co.in/>

Email: [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)

Valid till **April 2024**

# Disclaimer

The Audit Team has prepared this report for the **Shikshan Prasarak Sanstha's P.V.P.Mahavidyalaya Kavathe Mahankal** located at Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal, Dist-Sangli Pin-416405, Maharashtra, India based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the Hon'ble Management and College. The warranty or undertaking, expressed 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.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied or regenerated in any form.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

## Greenvio Solutions

*Developing Healthy and Sustainable Environments*

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

Palghar District, Maharashtra- 401208

[sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com)

## Acknowledgement

The Audit Assessment Team thanks the **Shikshan Prasarak Sanstha's P.V.P.Mahavidyalaya Kavathe Mahankal, Maharashtra, India** for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Mr. Balasaheb Aanandrao Shinde**, President; **Mr. Suresh Patil**, Vice President; **Mr. Sudarshan Balasaheb Shinde**, Secretary and everyone from the Management.

Our heartfelt thanks to Chairpersons of the entire process **Prof. (Dr.) M. K. Patil**, Principal for the valuable inputs.

We are also thankful to **College's Task force the Assistant Professors** who have collected data required - **Dr. B. T. Jadhav** and **Prof. Avinash Kamble**.

We highly appreciate the assistance of the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

### **Sustainable Academe**

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

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DETAILED REPORT

**Evidence documents for Site visit of external audit team**

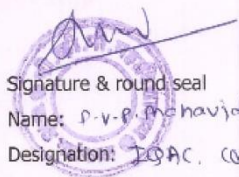
Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit       Energy audit       Environment audit

**Institute:** Padmabhushan Vasantgadada Patil      **Date:** 22/05/2023  
mahavidyalaya, Kavathe Mahankal,

**Document objective: Inferences of the Site visit**

Observations (Positive aspects)	Suggestions (Improvement aspects)
<b>Green Audit</b>	
- Rainwater harvesting is under practice, and is connected for use in chemistry lab.	- Waste management should be improved for [Plastic, E-waste, Organic & Liquid waste]
<b>Energy Audit</b>	
- Turbo ventilators are used for thermal comfort	- Undertake hybrid mode for alternate sources of energy - Replace with energy efficient lighting.
<b>Environment Audit</b>	
- Improve green cover of premises	- Lot of beautification should be undertaken for New Buildings.

  
Signature & round seal  
Name: P.V.P. Mahavidyalaya  
Designation: ISAC, Co-ordinator  
**For the said Institute**

  
Signature & round seal  
Name: Mr. F. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**



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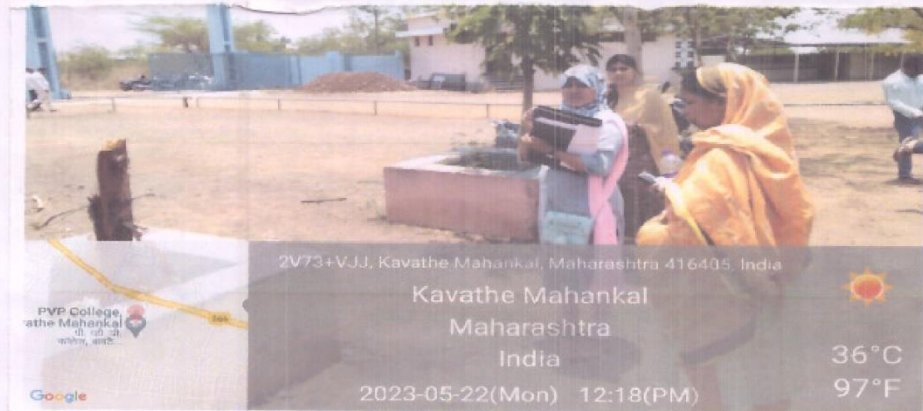
Audits covered:  Green audit  Energy audit  Environment audit

Institute: Padmabhushan Vasantlalada Patil Mahavidyalaya, Kavathe Mahankal, Date: 22/05/2023


Document objective: Proof of the Site visit



Meeting with the core team



Investigation of the systems

  
Signature & round seal  
Name: P.V. Mahalingappa  
Designation: Asst. Prof. Co-ordinator  
For the said Institute

  
Signature & round seal  
Name: F.A. Shaikh  
Designation: Project Coordinator  
For The Greenvio Solutions

# 1. Introduction

## 1.1 About the Institution

This college was established in a drought prone area where most of the students come from rural area with economical background. The College firmly believes that education is incomplete without discipline. The institution is confident in making a wholesome person out of the student only by instilling in him discipline which would go to foster a high degree of righteousness in and around him. Accordingly, a disciplinary committee monitors the discipline of the institution.

## 1.2 Assessment of the Institute

### 1.2.1 Affiliations

The technical course provided by the College is affiliated to **Shivaji University**, established in 1962, a state university located at Kolhapur, Maharashtra, India.

### 1.2.2 Certification

The College submits its academic records every year to the **All India Survey of Higher Education (AISHE)** Govt. of India through its registered allocated code which is C-11026.

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- To create a fine band of capable youngsters with great thirst for knowledge and scientific curiosity.
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- To provide opportunities to the P.V.P. Mahavidyalaya community to reach his/her highest personnel and professional capability.
- To develop the personality and character of students by value education.

## 2. Overview

### 2.1 Summarised Populace analysis for 2022-2023

#### 2.1.1 Students data

The data (shared by the Institute) shows there were a total of **1,075 male and 653 female students.**

#### 2.1.2 Staff data

S. No.	Type	Male	Female	Total
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<b>Total Staff Members</b>		<b>61</b>	<b>07</b>	<b>68</b>

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1	Teaching staff	40	06	46
2	Non-Teaching staff	32	01	33
<b>Total Staff Members</b>		<b>72</b>	<b>07</b>	<b>79</b>

*Table 2: Staff data of the Institution for 2021-2022*

The staff data shows the College premises had a total of **79 Staff Members.**

## **2.3 Total College Area & College Building Spread Area**

The **total site area is 10.32 acres** and the **total Built-up area of the Institute is 34,645 sq. ft.** for an approximately **1,796 footfalls.**

## **2.4 Institute Infrastructure**

### **2.4.1 Establishment**

The Institute was established in **1978.**

### **2.4.2 Spatial Organisation**

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc. The Institute is located pretty close to nature and hence has a very fresh environment which is absolutely pollution free and healthy. The Building is a Reinforced Cement Concrete (RCC) framework building.

DETAILED REPORT

## 3. Research

### 3.1 About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution sustainable and healthy premises for its inhabitants.

### 3.2 Analysis of the Green Building Study Audit

The procedure included detailed verification as follows:

- ➔ Investigation
- ➔ Technical discussion with team
- ➔ Observations
- ➔ Inferences

### 3.3 Strategy adopted for Green Building Study Audit

The strategies included data collection from the admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collection, and preparation of the Report.

### 3.4 Activities undertaken for the Green Building Study Audit

- ➔ Discussion with the Institute
- ➔ Allotment and Initiation by the Institute
- ➔ Data collection
- ➔ Submission of the files

### Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit

Institute: Padmabhushan Vasantbhadra Bli Mahavidyalaya, Karamnakhur Date: 21/01/2013

Document objective: Induction Meeting attendance sheet

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Mr. A. A. Kambale	Internal	J&A.C. co-ordinator	
4.	Dr. B. T. Jadhav	Internal	chairman, cri. VII	
5.	Mr. S. B. Patil	Internal	member, cri. VII	
6.	Mr. S. M. Sable	Internal	member, cri. VII	
7.	Mrs. P. R. Mali	Internal	member, cri. VII	

Signature & round seal  
Name: P. V. P. Mahavidyalaya  
Designation: J&A.C. coordinator  
For the said Institute

Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
For The Greenvio Solutions

**Evidence documents for Site visit of external audit team**

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit

Institute: Radmabhubhayan Vasantroodada Patil Date: 22/05/2017  
Memoridajalga, Karamnakhata

**Document objective: Exit Meeting attendance sheet**

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Mr. A. A. Kamble	Internal	IGAC, coordinator	
4.	Dr. B. T. Jadhav	Internal	Chairman, cr. VII	
5.	Mr. S. B. Patil	Internal	Member, cr. VII	
6.	Mr. S. M. Sable	Internal	- - -	
7.	Mr. P. R. Mali	Internal	- - -	

Signature & round seal  
Name: P. V. Mahavijalga  
Designation: IGAC, coordinator  
**For the said Institute**

Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**

## 4. Observations

Environment is an essential part for human survival. We co-exist with the environment and it cannot be termed as a separate entity. The Ecological audit helps to understand the flora, fauna that exists and steps that can be taken to improve the same.

To denote if there are problems related to sound in and around the surrounding. In terms of the carbon footprint it helps in keeping a tab on the eco-friendly habits incorporated by the inhabitants of the premises. Health today is the topmost priority, a general understanding of the initiatives undertaken along with sufficient hygiene practices adopted. Universal design is applicable to all built and unbuilt spaces.

### 4.1 Open Spaces

There is an open space in the premises used by students at present for sports and cultural gatherings. **There are provisions for natural plantations which have enhanced the beauty of the space.**

### 4.2 Flora and fauna audit

#### 4.2.1 Flora audit

A flora survey was carried out to identify the total numbers of plants and trees. The landscape area has a variety of plantations constituting hundreds of surveyed trees in premises in the last few years as follows with detail description of each.

S. No.	Plant name	Type	Nos.
1	<i>Azadirachta indica</i> A.juss	Tree	15
2	<i>Leucarna leucocephala</i> (Lam) de. wit	Tree	12
3	<i>Mimusops elengi</i> L.	Tree	25
4	<i>Solanum lycopersicum</i> L.	Shrub	5
5	<i>Ficus carica</i> L.	Tree	2
6	<i>Caesalpinia pulcherrima</i> (L) SW.	Tree	5
7	<i>Casuarina equisetifolia</i> L.	Tree	4
8	<i>Vitex nigundo</i> L.	Shrub	8

<b>9</b>	<i>Bougainvillea spectabilis willd.</i>	Shrub	5
<b>10</b>	<i>Aloe barbadensis miller.</i>	Herb	7
<b>11</b>	<i>Magnolia champaca (L) Baill.</i>	Tree	2
<b>12</b>	<i>Ficus religiosa L.</i>	Tree	3
<b>13</b>	<i>Tamarindus indica L.</i>	Tree	2
<b>14</b>	<i>Hamelia patens jacq.</i>	Tree	4
<b>15</b>	<i>Caesalpinia bonduc L.</i>	Tree	1
<b>16</b>	<i>Citrus indica yu. Tanaka</i>	Tree	1
<b>17</b>	<i>Asparagus racemosus willd.</i>	Herb	2
<b>18</b>	<i>Murraya koenigii L.</i>	Tree	5
<b>19</b>	<i>Marselia quadrifolia L.</i>	Herb	30
<b>20</b>	<i>Diospyros melanoxylon</i>	Herb	2
<b>21</b>	<i>Kigelia africana (Lam)</i>	Tree	1
<b>22</b>	<i>Peltophorum pterocarpum</i>	Tree	30
<b>23</b>	<i>Butea monosperma (Lam) k.taub</i>	Tree	2
<b>24</b>	<i>Prunus avium L.</i>	Tree	20
<b>25</b>	<i>Solanum album L.</i>	Shrub	4
<b>26</b>	<i>Tinospora Cordifolia (Thunb) Miers.</i>	Climber	1
<b>27</b>	<i>Duranta erecta L.</i>	Shrb	25
<b>28</b>	<i>Aegle marmelos L.</i>	Tree	3
<b>29</b>	<i>Lowsonia inermis L.</i>	Shrub	1
<b>30</b>	<i>Punica granatum L.</i>	Tree	1
<b>31</b>	<i>Ipomoea mauritiana jacq.</i>	Shrrub	5
<b>32</b>	<i>Kalanchoe pinnata (Lam) pers.</i>	Herb	7
<b>33</b>	<i>Zamia pumila L.</i>	Shrub	2
<b>34</b>	<i>Manilkarazapota L.</i>	Tree	2
<b>35</b>	<i>Justicia adathoda L.</i>	Shrub	2
<b>36</b>	<i>Ficus elastica Roxb.</i>	Tree	1
<b>37</b>	<i>Eichhornia crassipes mart.</i>	Herb	23
<b>38</b>	<i>Hiniscus rosa-sinesis L.</i>	Shrub	5
<b>39</b>	<i>Tecoma stans (L) Juss.</i>	Shrub	6
<b>40</b>	<i>Melaleuca citrinu (curtis).</i>	Shrub	2

41	<i>Russelia equisetiformis schlecht.cham</i>	Shrub	2
42	<i>Thuja occidentalis L.</i>	Tree	4
43	<i>cycas circinalis L.</i>	Shrub	6
44	<i>Ixora coccinea L.</i>	Shrub	5
45	<i>Jasminum sambac (L) Aiton.</i>	Shrub	3
46	<i>Phyllanthus emblica L.</i>	Shrub	1
47	<i>Carissa corandas L.</i>	Shrub	1
48	<i>Lagerstroemia speciosa (L) Pels.</i>	Tree	1
49	<i>Acacia penninervis DC.</i>	Tree	4
50	<i>Lantana camara Linn.</i>	Shrub	19
51	<i>Moringa oleifera Lam.</i>	Tree	4
52	<i>Annona reticulata L.</i>	Tree	1
53	<i>Crossandra infundibuliformis L.</i>	Herb	6
54	<i>Allamanda L.</i>	Tree	1
55	<i>Dyopsis decaryi Jum.</i>	Shrub	7
56	<i>Amorphophallus paeoniifolius L.</i>	Herb	1
57	<i>Ficus racemosa L.</i>	Tree	2
58	<i>Carica papaya L.</i>	Tree	1
59	<i>Datura stramonium L.</i>	Shrub	4
60	<i>Pithecellobium dulce Roxb.</i>	Tree	2
61	<i>Mangifera indica L.</i>	Tree	1
62	<i>Psidium guajava L.</i>	Tree	1
63	<i>Alstonia scholaris L.</i>	Tree	28
64	<i>Millettia pinnata L.</i>	Tree	4
65	<i>Syzigium cumini L.</i>	Tree	2
66	<i>Bixa orellena L.</i>	Tree	4
67	<i>Cereus hexagonus</i>	Tree	2
68	<i>Flaxinus lanuginosa koidz.</i>	Shrub	2
69	<i>Caryota mitis Lour.</i>	Tree	2
70	<i>Wisteria bifurcata A.K. Irvine.</i>	Tree	1
71	<i>Dyopsis lutescens (H.wendl)</i>	Tree	4
72	<i>Tabernaemontana divaricata</i>	Shrub	2

<b>73</b>	<i>Dracaena trifasciata (Prain) mobb.</i>	Herb	8
<b>74</b>	<i>Antigonon leptopus (Hook&amp;Arn.)</i>	Climber	2
<b>75</b>	<i>Passiflora rocemosa Brot.</i>	Climber	2
<b>76</b>	<i>Pandanus odorifer ( forssk.)</i>	Shrub	1
<b>77</b>	<i>Monoon longifolium</i>	Shrub	2
<b>78</b>	<i>Aristolochia ringens</i>	Climber	1
<b>79</b>	<i>Codiaeam vaxegatum L. A. juss</i>	Shrub	2
<b>80</b>	<i>Antigonon leptopus (Hook&amp;Arn)</i>	Shrub	2
<b>81</b>	<i>Epipremnum aureum (Linden&amp;Andre)</i>	Climber	4
<b>81</b>	<i>Codiaeum variegatum L.</i>	Shrub	5
<b>82</b>	<i>Pandanus odorifer (Forssk)</i>	Shrub	1
<b>83</b>	<i>Monoon longifolium</i>	Shrub	1
<b>84</b>	<i>Aristolochia ringes</i>	Climber	2

*Table 3: Details of the Flora in the premises*

**At present there is more than 440 numbers of plantations comprising of plants, trees, shrubs.** All of these are planted by the on various occasions and some have grown naturally. Timely maintenance with sufficient care has resulted in positive benefits for the surroundings.

#### 4.1.2 Fauna audit

The details of the fauna available in the premises are documented below:

<b>Fauna</b>	<b>Names</b>	<b>Nos.</b>
<b>Birds</b>	Sparrow, Kingfisher, Humming Bird,Owl, Crane,Crow,Bulbul,Dove,	9
<b>Insects</b>	Snail, Housefly, Honey bee, Dragonfly, Mosquito,Ant, Scorpion, Cockroach,Moth, Spider, Termite, Cricket,Glow warm, Beetle, Butterfly, Centipede,Wasp	19
<b>Reptiles</b>	Gecko, Lizard,, Cobra,Ratsnake, Banded Kukri Snake, Earthworm,	7
<b>Amphibians</b>	Frogs,	1
<b>Mammals</b>	Cats, Monkey, Mouse, Squirrels	5

*Table 4: Details of the fauna in the premises*

**The premise has a beautiful and rich fauna; it enhances the co-existence and provides a fresh environment for the premises.**

### 4.3 Noise Audit

On a macro level the College is surrounded by huge farms and minimal residential blocks **thus there is a peaceful and noise free arena observed inside the premises.**

### 4.4 Carbon Footprint Audit

#### 4.4.1 Eco-friendly Commuting Practices

- The site is located in a rural locality.
- Overall, the carbon footprint is well under control.
- Students and staff members commute using public transport.
- There are no major fossil fuels used inside the premises.

#### 4.4.2 Heat Island Reduction

The external temperature is too hot and certain provisions should be undertaken such as shaded walkways and huge nos. of plantations all over the premises.

#### 4.4.3 Outdoor Light Pollution Study

The College compound lights are not upward looking thus, these do not cause light pollution.

### 4.5 Universally accessible premises

*As per World Report on Disability, 2011 there are 180 million approx. Persons with Disabilities that makes it 15% of total population of India.*

The following facilities are available on the premises for the specially-abled as part of universally accessible premises initiatives.

- Low height risers in the staircases
- Non-slippery floor surfaces
- Toilets for the specially abled

## 4.6 Fire Safety

Fire and life safety are an important consideration of the National Building Code 2016. This aspect is touched upon as part of this study in the capacity of an Architect registered with the Council of Architecture. As part of the research, fire safety audit was considered from the 'Building systems' perspective. **All provisions such as extinguishers, sand buckets have been undertaken.**

DETAILED REPORT

## 5. Suggestions

### 5.1 Section-wise suggestions related to premises

The following suggestions are to be considered as a **first priority** for implementation. These **should be executed within the next 1.5 to 2.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

#### 5.1.1 Site beautification

- ➔ **Beautification of the entrance pathway** - The existing bricks (waste from the existing new construction going on) can be used or upgraded the pathway through an appropriate Landscape Architecture design.
- ➔ **Bird house/ Feeders** - At appropriate locations there can be provisions for drinking water and some grains for birds as they visit the site much frequently.
- ➔ **Child area** - There can be one provision where if student's or staff relative who are toddlers or senior citizens can rest and this area could have facilities accordingly.

#### 5.1.2 Heat island reduction

**Cool rooftops** - It is suggested that the Institute gets the Terrace roofs painted with Cooltop as it will help reduce the temperature of the spaces.

#### 5.1.3 Universally accessible premises

- ➔ **Resting places** - There should be increased provision for resting places on-premises outdoor and indoors.
- ➔ **Provisions for visually impaired - Signages** – In addition to the signages being in regular language there should be additional signages in braille language for the specially-abled students.
- ➔ **Provisions for visually impaired - Tactile flooring** – The indoor and outdoor of the premises should have dedicated tactile flooring for the visually impaired.

### 5.1.4 Life safety

- ➔ **Combustible equipment** - Every space which has a gas cylinder or combustible equipment should have a provision for the barricade around the gas cylinders, appropriate safety board's mentioning 'danger sign' and 'Do not touch' with an additional small fire extinguisher close by.
- ➔ **Sensitization programs** - Regular seminars/ webinars by experts such as Architects, Govt. Fire department on subjects related to fire and life safety should be organized and the outputs should be adopted and documented.

### 5.1.5 Pollution Control

- ➔ **Specific area designated for E-vehicles** – There should be designated area dedicated to E-vehicles parking and charging and this zone should be demarcated as 'Eco-Zone'
- ➔ **Promote the use of Eco-friendly vehicles** - There can be student and staff sensitization program on eco-friendly and battery-operated vehicles/ low emission vehicles for daily use.
- ➔ **Battery charging points for Eco-friendly vehicles** - There can be provision for battery charge points, this would inspire students to change their mode of transportation and adopt sustainable practices.
- ➔ **Avoid burning waste** - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff



On-site investigation of the Old campus



On-site investigation of the internal spaces



Details about the various types of dustbins and the oxygen park



Rain water harvesting facility in the premises

## 6. Compilation

The study is based on the data collected, analyzed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyze and study the data collected.

- ➔ Uniform Plumbing Code – India, 2008
- ➔ IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- ➔ IGBC Green Landscape Rating system, March 2013
- ➔ BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
- ➔ Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.



# Energy Audit Certificate (As per Green Building Parameters)

The study is conducted as per Indian and International Green Building Standards initiated in the capacity of an Accredited & Certified Green Building Professional

It is awarded for **2021-2022 and 2022-2023** to the Esteemed Institution

(Analysed for 2 years and extended validity for 1 year, thus total 3 years)

Shikshan Prasarak Sanstha's

## P. V. P. Mahavidyalaya Kavathe Mahankal

Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal, Dist-Sangli Pin-416405, Maharashtra, India

(Site visit held on Monday, 22 May 2023)

As part of the Institution's initiatives for a Healthy & Sustainable Institute the audit was conducted. We appreciate the immense efforts taken by Staff and students towards the Energy Management and Conservation.

Issued on **Monday, 22 May 2023** and valid till **30 April 2024**

  
**Ar. Nahida Abdulla Shaikh**

"Elite 100 Green Architects of India" Eonaur, 2022

Registered Architect, P.G.D.R.D, ISO Certified I. A. (IMS)

Indian Green Building Council Accredited Professional (IGBC AP)

ASSOCHAM GEM Green Building Council Certified Professional (**Registration. No. 22/718**)

**Project Head and Green Building Professional-Consultant**

Sustainable Academe I Sustainability Department of Greenvio Solutions, Naigad

An environment Design and Consultancy developing Healthy and Sustainable Environments

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Website: <https://thegreenviosolutions.co.in/>

# ENERGY AUDIT

STUDY PERIOD (TWO YEARS) 2021 - 2022 & 2022 - 2023

Sustainability study  
**AUDIT REPORT**

Studied for  
Shikshan Prasarak Sanstha's  
**P. V. P. Mahavidyalaya**  
**Kavathe Mahankal**

Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal,  
Dist-Sangli Pin-416405, Maharashtra, India

Studied in the capacity of

Accredited and Certified  
Green Building Professional



Website: <https://thegreenviosolutions.co.in/>

Email: [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)

Valid till **April 2024**

# Disclaimer

The Audit Team has prepared this report for the **Shikshan Prasarak Sanstha's P.V.P.Mahavidyalaya Kavathe Mahankal** located at Vidyanagar, Kavathe Mahankal Tal-Kavathe Mahankal, Dist-Sangli Pin-416405, Maharashtra, India based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the Hon'ble Management and College. The warranty or undertaking, expressed 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.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied or regenerated in any form.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

## Greenvio Solutions

*Developing Healthy and Sustainable Environments*

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

Palghar District, Maharashtra- 401208

[sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com)

## Acknowledgement

The Audit Assessment Team thanks the **Shikshan Prasarak Sanstha's P.V.P.Mahavidyalaya Kavathe Mahankal, Maharashtra, India** for assigning this important work of Energy Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Mr. Balasaheb Aanandrao Shinde**, President; **Mr. Suresh Patil**, Vice President; **Mr. Sudarshan Balasaheb Shinde**, Secretary and everyone from the Management.

Our heartfelt thanks to Chairpersons of the entire process **Prof. (Dr.) M. K. Patil**, Principal for the valuable inputs.

We are also thankful to **College's Task force the Assistant Professors** who have collected data required - **Dr. B. T. Jadhav** and **Prof. Avinash Kamble**.

We highly appreciate the assistance of the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

### **Sustainable Academe**

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

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DETAILED REPORT

**Evidence documents for Site visit of external audit team**

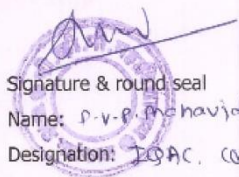
Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit       Energy audit       Environment audit

**Institute:** Padmabhushan Vasantgadada Patil      **Date:** 22/05/2023  
mahavidyalaya, Kavathe Mahankal,

**Document objective: Inferences of the Site visit**

Observations (Positive aspects)	Suggestions (Improvement aspects)
<b>Green Audit</b>	
- Rainwater harvesting is under practice, and is connected for use in chemistry lab.	- Waste management should be improved for [Plastic, E-waste, Organic & Liquid waste]
<b>Energy Audit</b>	
- Turbo ventilators are used for thermal comfort	- Undertake hybrid mode for alternate sources of energy - Replace with energy efficient lighting.
<b>Environment Audit</b>	
- Improve green cover of premises	- Lot of beautification should be undertaken for New Buildings.

  
Signature & round seal  
Name: P.V.P. Mahavidyalaya  
Designation: ISAC, Co-ordinator  
**For the said Institute**

  
Signature & round seal  
Name: Mr. F. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**



### Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

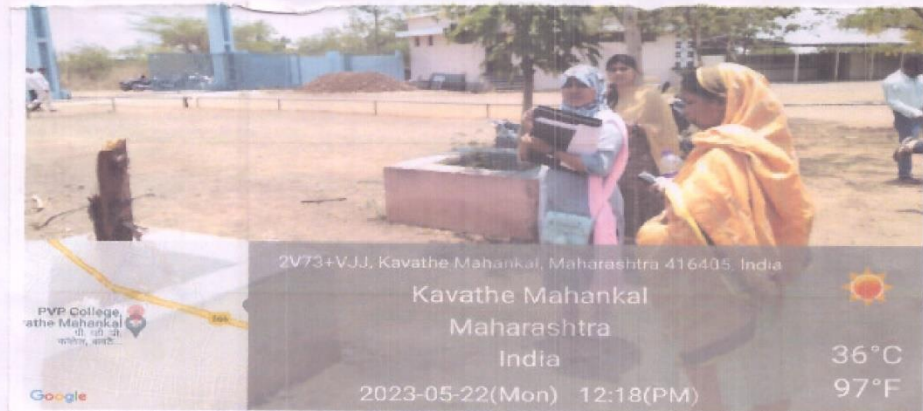
Audits covered:  Green audit     Energy audit     Environment audit

Institute: Padmabhushan Vasantlalada Patil Mahavidyalaya, Kavayemahankal,    Date: 22/05/2023


Document objective: Proof of the Site visit



Meeting with the core team



Investigation of the systems

  
Signature & round seal  
Name: P.V. Mahalingappa  
Designation: Asst. Prof. Co-ordinator  
**For the said Institute**

  
Signature & round seal  
Name: F.A. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**

# 1. Introduction

## 1.1 About the Institution

This college was established in a drought prone area where most of the students come from rural area with economical background. The College firmly believes that education is incomplete without discipline. The institution is confident in making a wholesome person out of the student only by instilling in him discipline which would go to foster a high degree of righteousness in and around him. Accordingly, a disciplinary committee monitors the discipline of the institution.

## 1.2 Assessment of the Institute

### 1.2.1 Affiliations

The technical course provided by the College is affiliated to **Shivaji University**, established in 1962, a state university located at Kolhapur, Maharashtra, India.

### 1.2.2 Certification

The College submits its academic records every year to the **All India Survey of Higher Education (AISHE)** Govt. of India through its registered allocated code which is C-11026.

### 1.2.3 Recognitions

The College has upgraded in the teaching level – Under graduate to Post graduate in the **section 2(f) and 12 (B) of the University Grants Council Act, 1956 in 1994** with affiliation nos. being 8-131/93 and F.B-131/93 respectively.

## 1.3 Statements of the Institution

### 1.3.1 Vision

The College proposes "Sanstha is committed to meet the education, social, cultural and economic needs of the region and the nation to create a just and human society."

### 1.3.2 Mission

The College adheres and focuses "To promote and foster a culture of high quality teaching and learning and to serve societal needs by encouraging, generating and promoting excellence in research and extension activities."

### 1.3.3 Goals

The College has formulated the following aim to achieve its mission:

- ➔ To make relentless efforts for the spread of education among classes and communities, that are socially and educationally underprivileged.
- ➔ To make special provision and for disseminating knowledge and promoting arts and culture in rural areas.
- ➔ To supervise and control the conduct and discipline of the students of the P.V.P. Mahavidyalaya and to make arrangements for promoting their health and general welfare.
- ➔ To create a fine band of capable youngsters with great thirst for knowledge and scientific curiosity.
- ➔ To promote the study and research of the Marathi language and the history of Maharashtra.
- ➔ To provide opportunities to the P.V.P. Mahavidyalaya community to reach his/her highest personnel and professional capability.
- ➔ To develop the personality and character of students by value education.

## 2. Overview

### 2.1 Summarised Populace analysis for 2022-2023

#### 2.1.1 Students data

The data (shared by the Institute) shows there were a total of **1,075 male and 653 female students.**

#### 2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Teaching staff	30	06	36
2	Non-Teaching staff	31	01	32
<b>Total Staff Members</b>		<b>61</b>	<b>07</b>	<b>68</b>

*Table 1: Staff data of the Institution for 2022-2023*

The staff data shows the College premises had a total of **68 Staff Members.**

### 2.2 Summarised Populace analysis for 2021-2022

#### 2.2.1 Students data

The data (shared by the Institute) shows there were a total of **1,172 male and 648 female students.**

#### 2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Teaching staff	40	06	46
2	Non-Teaching staff	32	01	33
<b>Total Staff Members</b>		<b>72</b>	<b>07</b>	<b>79</b>

*Table 2: Staff data of the Institution for 2021-2022*

The staff data shows the College premises had a total of **79 Staff Members.**

## **2.3 Total College Area & College Building Spread Area**

The **total site area is 10.32 acres** and the **total Built-up area of the Institute is 34,645 sq. ft.** for an approximately 1,796 footfalls.

## **2.4 Institute Infrastructure**

### **2.4.1 Establishment**

The Institute was established in **1978**.

### **2.4.2 Spatial Organisation**

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc. The Institute is located pretty close to nature and hence has a very fresh environment which is absolutely pollution free and healthy. The Building is a Reinforced Cement Concrete (RCC) framework building.

DETAILED REPORT

## 3. Research

### 3.1 About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution sustainable and healthy premises for its inhabitants.

### 3.2 Analysis of the Green Building Study Audit

The procedure included detailed verification as follows:

- ➔ Investigation
- ➔ Technical discussion with team
- ➔ Observations
- ➔ Inferences

### 3.3 Strategy adopted for Green Building Study Audit

The strategies included data collection from the admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collection, and preparation of the Report.

### 3.4 Activities undertaken for the Green Building Study Audit

- ➔ Discussion with the Institute
- ➔ Allotment and Initiation by the Institute
- ➔ Data collection
- ➔ Submission of the files

**Evidence documents for Site visit of external audit team**

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit

Institute: Padmabhushan Vasantbhadra Bli Mahavidyalaya, Karamnakhur Date: 21/01/2013

**Document objective: Induction Meeting attendance sheet**

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Mr. A. A. Kambale	Internal	J&A.C. co-ordinator	
4.	Dr. B. T. Jadhav	Internal	chairman, cri. VII	
5.	Mr. S. B. Patil	Internal	member, cri. VII	
6.	Mr. S. M. Sable	Internal	member, cri. VII	
7.	Mrs. P. R. Mali	Internal	member, cri. VII	

Signature & round seal  
Name: P. V. P. Mahavidyalaya  
Designation: J&A.C. coordinator  
**For the said Institute**

Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**

**Evidence documents for Site visit of external audit team**

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit

Institute: Radmabhubhayan Vasantroodada Patil Date: 22/05/2017  
Memoridajalajal, Kovanmemonankal

**Document objective: Exit Meeting attendance sheet**

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Mr. A. A. Kamble	Internal	IGAC, coordinator	
4.	Dr. B. T. Jadhav	Internal	Chairman, crj-VII	
5.	Mr. S. B. Patil	Internal	Member, crj-VII	
6.	Mr. S. M. Sable	Internal	- 11 -	
7.	Mr. P. R. Mali	Internal	- 11 -	

Signature & round seal  
Name: P. V. Mahabirajalajal  
Designation: IGAC, coordinator  
**For the said Institute**

Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
**For The Greenvio Solutions**

## 4. Investigation

### 4.1 Sources analysis

The primary and secondary sources of energy consumption are based on the electrical supply through the local government.

### 4.2 Energy efficiency analysis

#### 4.2.1 Energy efficient practices for alternative sources

There are no provisions available at present.

#### 4.2.2 Energy efficient equipment

- The premise has LED Lights in multiple spaces.
- There are no energy efficient fans in the premises.

## 5. Documentation

### 5.1 Primary sources of energy consumption

- **Electrical (Metered)** – Light, Fans, Equipments, Pumps comprise these sources.
- **Renewable energy** – There are 'NO sources' to harness solar energy in the premises through solar panels.

### 5.2 Secondary sources of energy consumption

The premise uses batteries, inverters as backup for administrative purposes. The details of the existing sources are documented below:

S. No.	Name	Nos.
1	Inverters	4
2	Batteries	8
3	Gas cylinders	4

*Table 3: Details of secondary sources of energy consumption*

### 5.3 Actual Electrical Consumption as per Bills

The College spends a substantial amount on electricity bills every month. However, we would like to recommend the use of alternate sources of energy to harness the electrical loads and reduce the monetary expenses.

S. No.	Month	Year	Amount	Units consumed
<b>Academic year 1</b>				
1	June	2021-2022	9,860	1,095
2	July	2021-2022	8,060	671
3	August	2021-2022	2,870	358
4	September	2021-2022	4,950	618
5	October	2021-2022	3,040	380

<b>6</b>	November	2021-2022	6,040	604
<b>7</b>	December	2021-2022	4,390	548
<b>8</b>	January	2021-2022	5,350	528
<b>9</b>	February	2021-2022	6,950	695
<b>10</b>	March	2021-2022	12,680	1,056
<b>11</b>	April	2021-2022	18,520	1,542
<b>12</b>	May	2021-2022	16,120	1,343
<b>Academic year 2</b>				
<b>13</b>	June	2022-2023	3,310	413
<b>14</b>	July	2022-2023	12,020	1,001
<b>15</b>	August	2022-2023	8,950	745
<b>16</b>	September	2022-2023	10,030	835
<b>17</b>	October	2022-2023	7,050	587
<b>18</b>	November	2022-2023	8,090	674
<b>19</b>	December	2022-2023	7,590	632
<b>20</b>	January	2022-2023	8,030	662
<b>21</b>	February	2022-2023	7,030	585
<b>22</b>	March	2022-2023	16,040	1,336
<b>23</b>	April	2022-2023	15,490	1,106

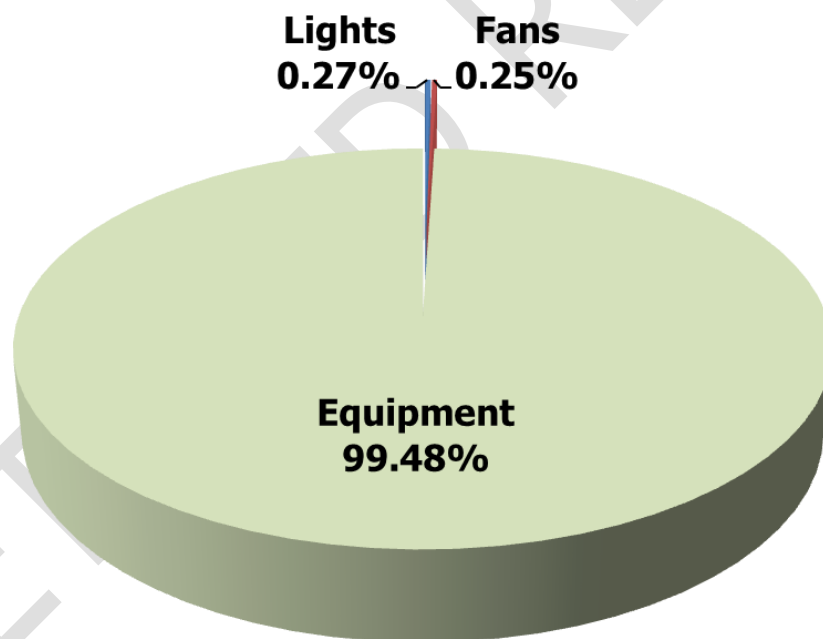
*Table 4: Details of the electrical consumption*

## 5.4 Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff.

The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, air conditioner, and equipment. The inventory and data collection for sources of energy consumed in the premise in summarised in the following sections.

The following documentation is based on the consumption practice of the premises on a regular working day.



*Figure 1: Summary of the calculated electrical consumption as per inventory*

The above graph shows that equipment consumes 99.48% whereas the lights consume 0.27% and the fans consume 0.25% each of the total calculated electrical energy.

## 5.5 Lights

### 5.5.1 Types of lights based on the numbers

There are a total of **62 nos. of Non-LED lights** the premises.

### 5.5.2 Types of lights based on the power consumption

The energy consumption of lights is **4,788 kWh** of energy.

## 5.6 Fans

### 5.6.1 Types of fans based on the numbers

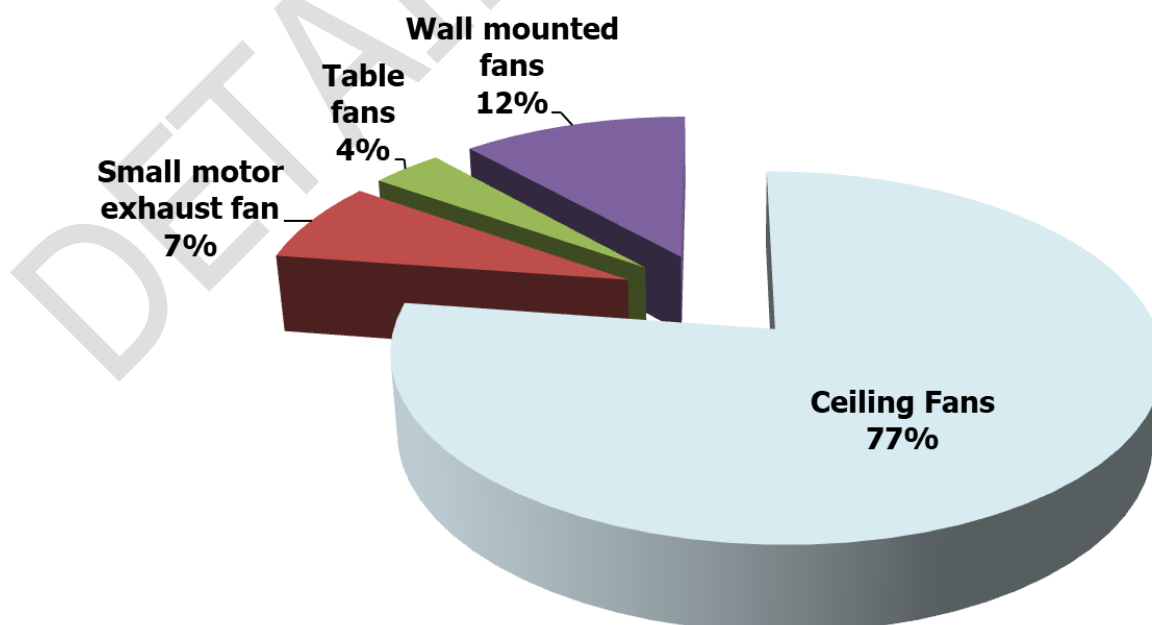
There are a total of **51 fans** on the premises as follows:

S. No.	Type	Nos.
1	Ceiling Fans	39
2	Small motor exhaust fan	3
3	Table fans	2
4	Wall mounted fans	7

*Table 5: Summary of the types of fans in the premises*

### 5.6.2 Types of fans based on the power consumption

The energy consumption of fans is **4,326 kWh** of the energy.



*Figure 2: Types of fans based on power consumption*

The above analysis shows the **Ceiling fans consume 77%** whereas the **wall mounted fans consume 12%** while the **small motor exhaust fans consume 7%** and the **table fans consume 4%** of the total power.

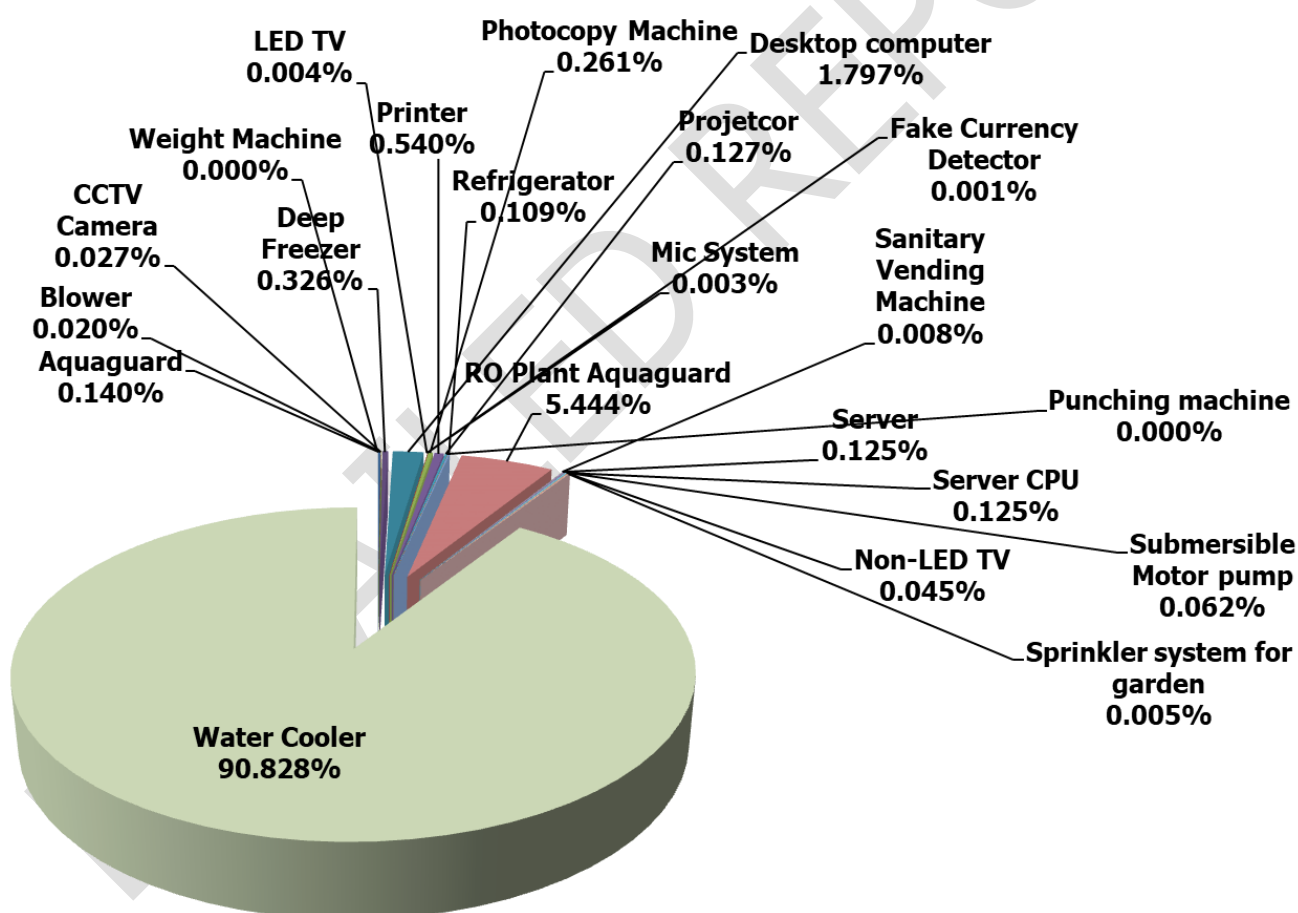
## 5.7 Equipment

### 5.7.1 Types of Equipment

There are **186 nos. of equipment** in the Educational sector.

### 5.7.2 Types of equipment as per their energy contribution

The energy consumption of equipment is **17,45,774 kWh** of energy.



*Figure 3: Energy consumed by types of equipment in the educational sector based on the usage study*

The above summary shows that the **water cooler consumes more energy at 90.828%** while the **RO plant Aquaguard system consumes 5.444%** the **desktop computer consumes 1.797%** and the **printer machine consumes 0.540%** these are the maximum consumers as compared to other equipment.

## 6. Suggestion

### 6.1 Section-wise suggestions

The following suggestions are to be considered as a ***first priority*** for implementation. These **should be executed within the next 1.5 to 2.5 years from the date of the Report submission.** The Institute can execute a plan after discussion with Project Head.

#### 6.1.1 Electromechanical systems - Electrical and Lighting

##### Section 1 - Non-LED lights

The current light analysis shows that Non-LED lights consume anywhere between 50W to 54W and even more when in use; these should be replaced with LED lights which consume on an average 12-16W when in use. Our technical analysis shows that there would be a reduction of an average of **67% reduction** in energy consumption through lights specifically as a part of the electro -mechanical system if all **Non-LED lights on all floors** are replaced with an energy efficient appliance whenever the College undergoes renovation.

##### Section 2 - Ceiling fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 45W when in use. These should be replaced with energy efficient fans consuming 14W when in use. Our detailed study states that is all the **ceiling fans on all floors** if replaced with star rated appliance results in a reduction of average of **69% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if College can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

## 6.2 General suggestions

The following details are consolidated study recommendations related to 'entire Institute' and should be considered as ***second priority*** for implementation, once the section wise recommendations are implemented. The following recommendations should be ***implemented within 2.5 to 3.5 years from the date of the Report submission.***

### 6.2.1 Alternatives to increase renewable energy

#### 6.2.1.1 Solar farms

This option can be explored with due discussion with the surrounding and adjacent farmland owners. This will serve as a noble project and will provide dual benefits to farm land and University w.r.t to electricity bill power reduction.



**Plate 1: Solar farm concept for the Institute (For reference purpose only)**

Image source: Zsuzsa Bóka from Pixabay

#### 6.2.1.2 Solar parking

The College can turn its existing parking areas into solar panel powered parking areas. This will provide shade and renewable energy benefit to the College.



**Plate 2: Solar parking concept for the Institute (For reference purpose only)**

Source: Image by <https://solarpowerproject.in/solar-panels-for-parking-lots.php>

## 6.2.2 Alternatives towards Smart premises mechanisms

### 6.2.2.1 Smart gardening

The College can undertake a Smart Gardening system using IoT Technology. This will result in saving time by scheduling time for watering; saving money through automated water schedules tracking dampness of soil to know when, how much water garden needs.

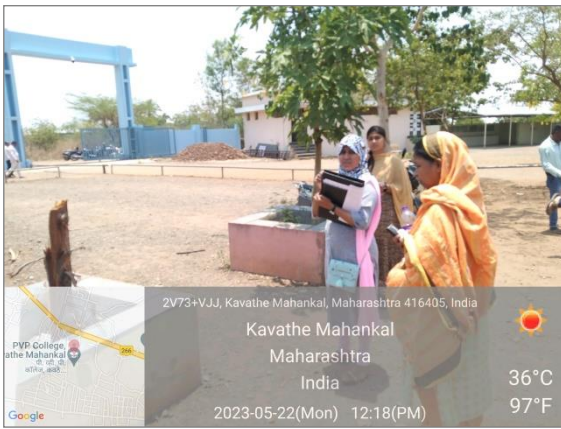


**Plate 3: Solar farm concept for the Institute (For reference purpose only)**

Image source: <https://housing.com/news/smart-gardening/>

Data source: <https://www.happysprout.com/inspiration/what-is-smart-gardening/>

DETAILS



On-site investigation of the Old campus



On-site investigation of the internal spaces



Details about the various types of dustbins and the oxygen park



Rain water harvesting facility in the premises

## 7. Compilation

The study is based on the data collected, analyzed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyze and study the data collected.

### Specific references for study related to energy

- ➔ <https://www.energy.gov/eere/buildings/zero-energy-buildings>
- ➔ <https://www.dsaarch.com/zero-net-positive-energy>
- ➔ U.S. Energy Information Administration
- ➔ <https://www.happysprout.com/inspiration/what-is-smart-gardening/>
- ➔ <https://housing.com/news/smart-gardening/>
- ➔ Inference study reference image - Zsuzsa Bóka from Pixabay
- ➔ Inference study reference image - <https://solarpowerproject.in/solar-panels-for-parking-lots.php>

