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Estd. 1954

SHRI SWAMI VIVEKANAND SHIKSHAN SANSTHA, KOLHAPUR

Shri Swami Vivekanand Shikshan Sanstha, Kolhapur Sanchlit,

PADMABHUSHAN DR. VASANTRAODADA PATIL MAHAVIDYALAYA, TASGAON

GREEN AND ENVIRONMENTAL AUDIT REPORT 2023-24

By

DS Energy Consultancy & Services, Sangli

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(BEE certified energy Auditor and manager)

P.D.V.P. MAHAVIDYALAYA TASGAON DIST SANGLI

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DISCLAIMER

Green Audit Team has prepared this report for Shri Swami Vivekanad Shikshan Sanstha Kolhapur Sanchit, Padmabhushan Dr. Vasantraodada Patil Mahavidyalaya, Tasgaon based on input data submitted by the representatives of College complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been complied in good faith based on information gathered.

It is further informed that the calculations are arrived flowing best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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EXECUTIVE SUMMERY

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. In accordance with the Green Campus Evaluation Plan, as suggested by the Internal Quality Assessment Cell (IQAC) of the college, Shri Swami Vivekanand Shikshan Sanstha Kolhapur Sanchlit, PADMABHUSHAN DR. VASANTRAODADA PATIL MAHAVIDYALAYA, TASGAON planned for conducting a green audit of the college in March 2024. After the field work and other formalities, the report was finally send for approval to the authority (principal and IQAC) in April 2024.

The purpose of the audit was to make sure that the practices followed in the campus are healthy and environment friendly. With this in mind, the specific objectives of the audit were to evaluate the degree to which the Departments are in compliance with the applicable regulations, policies and standards and to ensure that the development of the college aims at sustainable development and green campus. It works on several facets of green campus including water conservation, Electricity conservation, Tree plantation, Waste management, paperless work, Mapping of biodiversity. The methodology used included physical inspection of the campus and review of the relevant documentation. It can make tremendous impact on students' health and learning, college operational cost and the environment.

INTRODUCTION

Environmental audit or Green Audit is a systematic, documented, periodic and objective review by regulated entities of facility operations and practices related to meeting environmental requirements (EPA, 2003). In other words, it is a management tool comprising systematic, documented. Periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with company policies which would include regulatory requirements and standards applicable. (International Chamber of Commerce, 1989)

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties. Environmental auditing is used to investigate, understand and identify opportunities for better green campus.

Utility of Green Auditing

These are used to help improve existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organization's environmental effects in a systematic and documented manner and will produce an environmental audit report.

STATEMENT OF ASSURANCE

This audit has been already been conducted for two times the first time in the college. The audit procedure tried to meet the terms of International Standards of Internal Auditing. In our decision, sufficient and appropriate audit procedures were completed and evidence gathered to support the precision of the conclusions reached and contained in this report. The conclusions are based on a comparison of the situations as they existed at the time of the audit.

SUMMERY OF FINDING

The main findings of the audit show that, in general, all the departments and students are aware about the need for environmental protection at a general level. It was also observed that a number of best practices such as maintaining garden, planting trees in the campus, Vemi-compost to ensure a proper waste management technique, etc. are followed in the campus. However, on detailed review, it was observed that, as the college is implementing Green Campus Policy for the first time, many of the practices followed in the institution are still in nascent stage and needs further nurture. In addition, certain processes could benefit from further review in order to improve their efficiency, fairness and consistency.

OBJECTIVES AND SCOPE

The main objectives of the green audit are 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 make aware students to real concerns of environment and its Sustainability
- To secure the environment and cut down the threats posed to human health by analyzing 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.
- To bring out a present status report on environmental compliance

ABOUT COLLEGE

Shri Swami Vivekanad Shikshan Sanstha Kolhapur Sanchit, Padmabhushan Dr. Vasantraodada Patil Mahavidyalaya, Tasgaon was established on June 1962. The college is situated in a culturally rich locale, on the Sangli-Tasgaon Road, Tasgaon. It was founded by Shikashanmahrshi Dr. Bapuji Salunkhe with the aim of spreading education in rural area. Gradually the college gained eminence, not only from Tasgaon but also from nearby places.

Shri Swami Vivekanad Shikshan Sanstha Kolhapur Sanchit, Padmabhushan Dr. Vasantraodada Patil Mahavidyalaya, Tasgaon is a NAAC (B++ Grade) and 56 years old college having Three streams- Arts, Commerce and Science This is a government aided UGC-approved and NCTE recognized college affiliated by the Shivaji University. The college is situated on a beautiful campus of 11 acres inside The college building is located in a rural backdrop amidst lush green surroundings. The college has academic buildings and 1 hostel building. The college has an intention to adopt the 'Green Campus' system for environmental conservation and sustainability.

The goal is to reduce CO2 emission, energy and water usage, while creating an environmentally literate campus where students can learn the idea of protection of environment and stay healthy. The 'Green Campus' has been a very new concept adopted by this college. The college administration is still working on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, carbon footprints and Alternative Energy.

AUDIT GOALS OF THE COLLEGE

The college, with the advice of the Internal Quality Assessment Cell (IQAC) has set up an environmental quality assessment body (GREEN CAMPUS) that aimed at performing the green audit of the institution. The main objectives of the audit are:

- More efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- Recognize the cost saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Impart environmental education through systematic environmental management approach and Benchmarking for environmental protection
- Financial savings through a reduction in resource use
- Enhancement of college profile

METHODOLOGY

The Green Audit taken up by the Padmabhushan Dr. Vasantraodada Patil Mahavidyalaya, Tasgaon had been divided into three stages:

The Pre Audit Stage:

In the pre-audit stage, meetings provide an opportunity to support the capacity and objectives of the audit and enable discussions on the feasibility associated with the audit. The meeting provides the first opportunity to meet the audit and deal with several practical knowledge and concerns. The meeting provided the chance to gather information that the audit team can study before arriving on the site. The audit procedure and audit plan was handed over at this meeting and discussed in advance of the audit itself. In Padmabhushan Dr. Vasantraodada Patil Mahavidyalaya, Tasgaon, the planning of audit processes was discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the college management. The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself.

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on the environment, campus farming, planting more trees on the campus, etc., after the green auditing. The management of the college was willing to formulate policies based on green auditing report.

The Audit Stage:

The Audit Stage encompasses of the team selection and the field works performed. Looking after the unique structure, location and ambiance of the college, the Green Audit Team focused on Material Issues pertaining to college which have the highest influence on the Green Attributes of the College. The Audit stage also focused on the Methodology adopted. Checklist approach is adopted for transparent evaluation of the topics and increase readability for independent reader.

The Post Audit Stage:

The post-audit stage ensures formulation of Draft findings and sent to management response. Since the audit is done internally, it was important to ensure management approval for the

draft. After getting draft approval, the audit team went for final report formulation.The methodology adopted to conduct the Green Audit of the Institution had the following components.

Onsite Visit:

The Green Audit Assessment Team started the audit at the Institution on (write date) which extended for about 3 days. Greenhouse gas emissions and carbon footprint reduction through adoption of green energy and energy-efficient measures were assessed. The key focus was on assessing the status of the green cover of the Institution.

Focus Group Discussion:

The Focus Group included staff members and management people. The discussion was focused on identifying the attitudes and awareness towards environmental issues at the institutional, district, national and global level. The discussion revolved around three keyquestions: Do the members of the group consider themselves eco-conscious? Do they consider the Institution to be eco-friendly?Whatdotheythinkaretheissuesthatneedtobegiventop priority?

Office/Building Survey :

Information on office-based environmental impacts like built-up area, utility bills, energy-saving devices and IT equipment was collected. This information was added to the carbonfootprint data, generating a fairly clearer picture of theInstitution's annual greenhouse gas emissions and impact of the reduction measures undertaken.

Carbon Footprint:

- Data collected from the following sources were taken into consideration to calculate carbon footprint emission and reduction. The floristic richness of the campus – total number of plants, trees, shrubs–wasestimated.Theimpactofalternategreen energy production and consumption to reduce fossil fuel-based energy was assessed,

e.g. the number of CFL, LED, tube lights and electronic chokes was counted. The Carbon Footprint Calculator was used to arrive at conclusions.

- Carbon Footprint Calculator enables the measurement of carbon emission by the Institution. Besides, by breaking down the value to key 'carbon drivers', the institution can know how much of carbon footprint comes from which type of behavior (high power-consuming incandescent bulbs vs. LEDlights, solid waste management, etc.).

AUDIT FRAMEWORK AND DETAILED FINDINGS

The following audit framework is used for conducting Green Audit in 2017-18. The framework also lists the findings and observations for every criterion.

A] WATER MANAGEMENT

I] Rain Water Harvesting:

The **Rainwater harvesting** is the simple collection or storing of **water** through scientific techniques from the areas where the **rain** falls. It involves utilization of **rain water** for the domestic or the agricultural purpose.

In the campus, roof runoff water is collected through network of pipelines and stored in the tank. The total capacity of storage is 144 cubic meters. The remaining roof runoff water is allowed to infiltrate in the ground for recharge. The stored water is used for gardening and washing of vehicles.

This practice has solved the problem of deficiency of water and ground level of water has increased. The stored water is supplementary for the gardening and washing vehicles.

Water Harvesting Capacity of PDVP Campus:

Terrace Area (water collecting surface): 837 Sq. meters

Area m^2	Average Depth of rainfall (m)	Volume of Runoff (m^3)	30% losses	Total quantity (m^3)
837	0.4	334.8	100.44	234.36

Total quantity of Runoff = 234.36 cubic meters

Storage tank for rainwater harvesting = 144 cubic meters

The available total capacity of harvesting in campus = 90.36 cubic meters

Audit Observations:

- Regular checking and maintenance of pipelines are done to control water wastage.
- Water pipelines are arranged properly to collect the rain water from terrace to storage tank on ground.
- Proper cleanliness has maintained around the water storage area.
- No Water recycle Mechanism is adopted

Recommendation:

- Repair sources of water leakage, such as dripping taps.
- Use an efficient and hygienic water storage mechanism to minimize the loss of water during storage
- Install water recycling mechanism.

II] Water distribution system: Borewell

Underground water is one of the important sources of water in urban areas. With increasing urbanization, underground water has indiscriminately exploited causing depletion in water table and water availability. To reduce the effect of over exploitation, ground water discharge needs to be taken up in large scale at residential and institutional buildings.

College has used rainwater from the roof and allowed to flow through filters and recharge ground water from bore well. During heavy rainfall, water level in well raises and subsequently descends to maintain the ground water level. Total terrace area for ground recharge is 570 sq.meter

Audit Observations:

- the college has 5 aqua guard filters installed in all departments.
- Though water is used nominal in the college, but to ensure a further minimal rate, placards and warnings are set up in the college premise.
- Campus has efficient plumbing system from maintenance and operation point.
- Drip irrigation (this refers to plant watering system) is observed in campus to minimize wastage of water.

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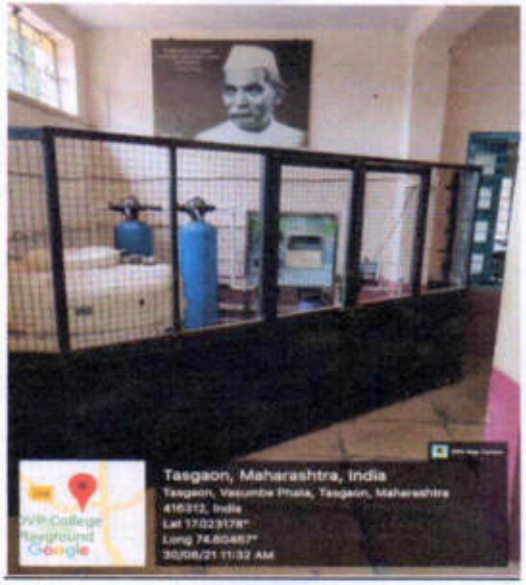

Recommendations:

- It is recommended to use aerators to water taps, automatic toilet faucets and dual flush toilet with cistern.
- Water distribution diagram/ water network/ water balance diagram would be useful for monitoring and reducing water consumption.
- Sewage treatment plant for treated sewage recycle would be useful for ecycling water after treatment.

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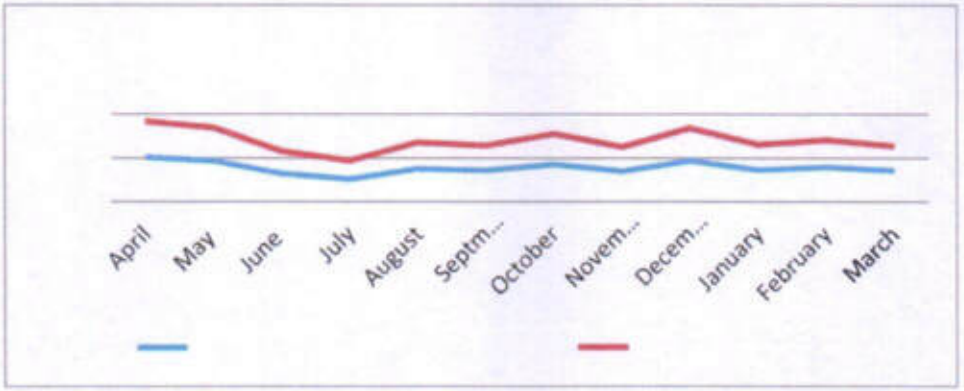
B] ENERGY MANAGEMENT

CARBON-Di-OXIDE EMISION

For consumption of 1 Unit (1 kWh) of Electricity, the CO2 emitted is 0.8 Kg. OR the Emission is 0.8 Kg/kWh. In the following Table we present the total units consumed and CO2 emitted as under:

Sr.No	month	Energy consumption (kWh)	CO_2 emitted in kg
1	January	5100	4080
2	February	4673	3738.4
3	March	3204	2563.2
4	April	2592	2073.6
5	May	3747	2997.6
6	June	3553	2842.4
7	July	4291	3432.8
8	August	3461	2768.8
9	September	4652	3721.6
10	October	3628	2902.4
11	November	3918	3134.4
12	December	3528	2822.4
	Avg	3862.25	3089.8

Chart: Monthly CO_2 Variation



Audit Observations:

- The college does not have any choice other than WBSEB for electric supply. The college also has 1 ecofriendly generator for the supply of emergency electricity to save our ecosystem.
- The college is planning for introduction of SOLAR PANNELs.
- The college is using LED lights but not as much as expected.
- College ensures that all electronic and electrical equipment, such as computers, are switched off when not in use and is generally configured in power saving mode when such option is available
- The college tries to put the main switch off when there is no need of electricity.

Recommendation:

- Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity
- Look in to the possibility of on-site micro-generation of renewable electricity.
- Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs
- Encourage staff, students and conference guests to save energy through visible reminders, incentives and information to increase awareness. This particularly concerns turning off electrical appliances when not in use

Audit Observations:

- Hybrid (Solar with wind miles) energy generation system is available in college campus. The device has rated power 2KW.

  Assuming total working hours -4 hours

  Total kWh or units energy obtained from renewable source is 8 kWh

- The college also has 1 ecofriendly generator for the supply of emergency electricity to save our ecosystem.
- The college is planning for introduction of SOLAR PANNELs.
- The college is using LED lights as expected.
- College ensures that all electronic and electrical equipment, such as computers, are switched off when not in use and is generally configured in power saving mode when such option is available
- The college tries to put the main switch off when there is no need of electricity.

Recommendation:

- Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity
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C] GREEN CAMPUS

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The Carbon Audit tools and analysis methodology were developed collectively by the Green Audit Team and based on that the audit was conducted in three major thematic areas. Carbon footprint is historically defined as the total set of greenhouse gas emissions caused by an individual, event, organization or product, expressed as carbon dioxide equivalent. Collected data at college campus is given below.

Sr.No.	Type of trees	No. of trees / area
1	Full grown trees	220
2	Semi grown trees	120
3	Bushes	500
4	lawn	60X30

I] Tools to measure Carbon Absorption:

Assumptions

Number of mature trees in 1 acre = 700

Carbon absorption capacity of 700 trees is equivalent to carbon emitted by a speeding car for 26,000 miles

3. 26,000 miles = 41,843 km

Average kilometres covered by a car per litre of petrol is 20 km

Total quantity of petrol consumed by the car (41,843/20) = 2092 litres

The carbon emitted by a car due to consumption of 1 litre of petrol is 2.3 kg CO_2. At this rate the total quantity of carbon emitted by 2092 litres of petrol (2092 × 2.3 kg) = 4812 kg CO_2 or 4.8 tonnes of CO_2. Therefore, the carbon absorption of one full-grown tree is 4812/700 = 6.8 kg CO_2. The footprint calculation is based on the standard unit of 1 litre petrol = **2.3 kg CO_2.**

Carbon absorption capacity of one full-grown tree = 6.8 kg CO_2. Therefore the carbon absorption capacity of 220 full-grown trees in the campus of the Institution (220× 6.8 kg CO_2) = 1496 kg of CO_2.

The carbon absorption capacity of 120 semi-grown trees is 50% of that of full grown trees. Hence, the carbon absorption (120× 3.4 kg CO_2) = **408 Kg of CO_2 .**

There are 500 bushes of various species being raised in the gardens of the Institution. Carbon absorption of bush plants varies widely according to the species. Certain bushes absorb as high as 49,000 g CO_2 per plant, whereas some others absorb as low as 150 g CO_2 per plant. In the absence of a detailed scientific study and botanical survey, the per-plant carbon absorption was assumed to be 200 g (in consultation with environment scientists). Based on this, the total carbon absorption of 500 plants was calculated to be 500 × 200 g = 100000 g or 100kg .

College has lawn around 60 X 30 Sq.m. Buffalo variegated grass, Mexican grass and indigenous grass species are being raised and maintained in the lawn. The total area of the lawn is 1800 sq.m. i.e 19375 Sq.ft the carbon absorption capacity of a 10 sq.ft. area of lawn is 1 g CO_2.

Hence, for 19375 sq.ft. of lawn absorbs 1937.5 g or 2 kg CO_2 per day. At this rate, the total carbon absorption per year (2kgx365) = **730 kg**

Sr.No.	Type of trees	No. of trees / area	Quantity of CO2 absorption per tree	Total quantity of CO2 absorbed (Kg)
1	Full grown trees	220	6.8 kg	1496 kg
2	Semi grown trees	120	3.4 kg	408 kg
3	Bushes	500	200 gram	100 Kg
4	lawn	60X30	10/sqft	730 Kg

II] Tools to measure oxygen emission:

According to the Arbor Day Foundation, a mature leafy tree produces as much oxygen in a season as 10 people inhale in a year' A person breathes 7 or 8 liters of air per minute. Air is about 20% oxygen. But the exhaled air has about 15% oxygen, and hence the net consumption is about 5%. Therefore, a person uses about 550 liters of pure oxygen each day.

Calculation of oxygen emission by flora:

The number of litres in 1 kilogram depends on the density of the substance being measured. Litre is a unit of volume, and kilogram a unit of mass. Litres and kilograms are approximately equivalent when the substance measured has a density of close to 1 kilogram per litre.

On average, one full-grown tree produces nearly 117.6 kg of oxygen each year. Two mature trees can provide enough oxygen for a family of four. Total oxygen emitted by 220 full-grown trees per year (117.6 kg × 220) = **25,872 Kg of O_2**

One semi-grown tree produces 58.8 kg of oxygen per year. Total oxygen emitted by semi-grown trees (58.8kg×120) = **7056 kg of O_2** (oxygen emission is 50% of that of the full-grown tree).

Total oxygen emitted by 500 bushes is calculated based on the following oxygen-inhaling requirement per person per day. A normal human being requires 550 litres of oxygen per day. 400 bushes produce enough oxygen per day to enable a person to breathe adequate quantity of oxygen of 550 litres. Total quantum of oxygen produced by 400 plants per day is 550 litres of oxygen. Taking 400 plants as one unit, the number of units of bushes in the campus (500/400) =1.25

Total quantity of oxygen produced by 1.25 units is (1.25 × 550 litres) = 687.5 litres of oxygen per day. The annual production of oxygen at this rate (687.5 × 365) = **250,937.5 litres or kg of oxygen per year**

Lawn is an incredible oxygen-making machine. A 25-sq.ft. area will supply enough oxygen to support one person for a day. Quantitatively speaking, this area of grass produces 550 litres of oxygen per day. The total area of lawn in the campus is 19375 sq.ft. In units, the value (19375/25) = 775 units, which produce (775 × 550 litres of oxygen) = 426,250 litres of oxygen per day. Total quantity of oxygen produced by the 19375 sq.ft. of lawn per year (426,250 litres/day × 365) = **155,581,250 litres or kg of oxygen per year.**

Sr.No.	Type of trees	No. of trees / area	Quantity of oxygen emmision per tree per year	Total Quantity of oxygen emission in kg
1	Full grown trees	220	117.6 kg	25,872 kg
2	Semigrowntrees	120	58.8 kg	7056kg
3	Bushes	500	687.5 kg per day	250,937.5 Kg
4	lawn	60X30	426,250 kg per day	155,581,250 Kg

Summary:

Sr. No.	Type of trees	No. of trees / area	Quantity of CO2 absorbtion per tree	Total quantity of CO2 absorbed (tonnes)	Quantity of oxygen emmision per tree	Total Quantity of oxygen emmision
1	Full grown trees	220	6.8 kg	1496 kg	117.6 kg	25,872 kg
2	Semi grown trees	120	3.4 kg	408 kg	58.8 kg	7056 kg
3	Bushes	500	200 gram	100 Kg	687.5 kg per day	250,937.5 Kg
4	lawn	60X30	10/sqft	730 Kg	426,250 kg per day	155,581,250 Kg
Total				**2734 kg or Approx. 3 Tonne per year**		**155,865,115.5 kg 155,865.115 tonne per year**

Audit Observations:

- College already has a well maintained garden.

- The college celebrates an annual tree plantation program in the campus where students and teachers plant trees in the campus.
- Moderate amounts of bio-fertilizers are used in the college.
- Negligible amounts of washing liquids are used in the college and all the toilet cleaners are not eco-friendly.

Green education has been given to improve environmental awareness

College has been reducing, reusing and recycling the products such as books, electronic appliances etc (e.g. at he time of de-selection and disposal of library material

Digitalization of majority of processes has been done.

College has been providing E- Resources: E books, Online Journals to save papers.

SOIL TO SILK

SOIL TO SILK A HANDS ON TRAINING PROGRAMME in **"Sericulture and Silk worm rearing"** has been carried out for 28 days. The training programmes have covered following subjects:
1)Mulberry cultivation.

2)Silkworm rearing (Young age and Late age silkworm rearing),

3)Silkworm seed production technology,

4)Extension management and transfer of technology, and Post cocoon technology

Mulberry Plantation:

as a unique plant on this earth due to its broader geological distribution across the continents; ability to be cultivated in different forms; multiple uses of leaf foliage and its positive impact in environmental safety approaches such as eco-restoration of degraded lands, bio-remediation of polluted sites, conservation of water, prevention of soil erosion and improvement of air quality by carbon sequestering It has issued as a medicinal plant in improving and enhancing the life of human beings by utilizing the biologically active

pharmacokinetic compounds found in leaf, stem and root parts. Further industrial exploitation of mulberry through preparation of various products in pharmaceutical, food, cosmetic and health care industries has gained the \attention of industrialists

As mulberry is being exploited by sericulture, pharmaceutical, cosmetic, food and beverage industries along with its utilization in environmental safety approach; it is appropriate to call it as a most suitable plant for campus plantation

List of medicinal plants cultivated in the Institute.

Sr.No.	Botanical Name	Marathi Name	Family	Medicinal uses
1.	*Garcinia indica Choisy*	□□□□	Clusiaceae	Anti – acidic Juice
2.	*Pterospermum suberifolium (L.) Willd.*	□□□□□□□	Malvaceae	Aromatic
3.	*Piper cubeba L.f.*	□□□□□	Piperaceae	Spices
4.	*Gardenia gummifera L.f.*	□□□□□□□□	Rubiaceae	Digestive disorder
5.	*Coffea Arabica L.*	□□□□	Rubiaceae	Beverage
6.	*Couroupita guianensis Aubl.*	□□□□□□□□	Lecythidaceae	Malaria

7.	*Borassus flabellifer L.*	□□□	Arecaceae	Energy Drink
8.	*Lawsonia inermis L.*	□□□□□□□	Lythraceae	Natural Dye, Jaundice
9.	*Aquilaria malaccensis Lam.*	□□□□□□□□□	Thymelaeaceae	Asthma
10.	*Butea monosperma (Lam.) Taub.*	□□□	Fabaceae	Natural Dye
11.	*Chonemorpha fragrans (Moon) Alston.*	□□□□	Apocynaceae	Anti-Diabetic
12.	*Bixa orellana L.*	□□□□□□	Bixaceae	Natural Dye
13.	*Gmelina arborea Roxb.*	□□□□	Lamiaceae	Anti Diabetic
14.	*Manilkara hexandra*	□□□□□	Sapotaceae	Fever, Jaundice
15.	*Asparagus racemosus Willd.*	□□□□□□	Asparagaceae	Cancer
16.	*Pterocarpus santalinus L.f.*	□□□□□□□□	Fabaceae	Tonic, Swelling
17.	*Prosopis cineraria (L.) Druce.*	□□□	Fabaceae	Asthma
18.	*Bacopa monnieri (L.) Pennell*	□□□ □□□□□□□□	Plantaginaceae	Anti Diabetic
19.	*Helicteres isora L.*	□□□□□ □□□□	Malvaceae	Anti Diabetic
20.	*Solanum nigrum L.*	□□□□□	Solanaceae	Skin Diseases
21.	*Strobilanthes callosa Nees.*	□□□□□	Acanthaceae	Jaundice
22.	*Basella alba L.*	□□□□□□	Basellaceae	Leaf Vegetable
23.	*Coleus amboinicus Lour.*	□□□□□□	Lamiaceae	Gastric Disorders
24.	*Sapindus saponaria L.*	□□□□	Sapindaceae	Astringent, Soap Nut

25.	*Elaeocarpus ganitrus Roxb. ex G.Don*	□□□□□□□□□	Elaeaocarpaceae	Blood Purifier
26.	*Convolvulus prostrates Forsk.*	□□□□□□□□□	Convolvulaceae	Brain Tonic
27.	*Dalbergia sissoo Roxb.*	□□□□	Fabaceae	Molluscicidal, Tooth Brush
28.	*Piper longum L.*	□□□□□ □□□□□□	Piperaceae	Chronic Malaria, Stomachache
29.	*Plumbago zeylanica L.*	□□□□□□□□□□□	Plumbaginaceae	Skin diseases
30.	*Premna serratifolia L.*	□□□□□	Lamiaceae	Anti-pyretic
31.	*Mussaenda frondosa L.*	□□□□□ □□□□□□□	Rubiaceae	Tuberculosis, Jaundice
32.	*Madhuca longifolia (J.Konig)*	□□□□	Sapotaceae	Tonic, Cough
33.	*Carissa carandas L.*	□□□□□	Apocynaceae	Skin disease
34.	*Eclipta prostrata (L.) L.*	□□□□	Asteraceae	Cough and Asthma
35.	*Wrightia antidysenterica (L.) R.Br.*	□□□□	Apocynaceae	Skin disorders
36.	*Alstonia scholaris (L.) R.Br.*	□□□□□□	Apocynaceae	Fevers, Dysentery, Cancer, Malaria
37.	*Gymnema sylvestre R. Br.*	□□□□□□□□	Apocynaceae	Diabetes, Weight loss, Cough
38.	*Mammea suriga (Buch.-Ham. ex Roxb.) Kosterm.*	□□□□□□	Calophyllaceae	Dyspepsia and Haemorroid
39.	*Mentha spicata L.*	□□□□	Lamiaceae	Cough, Cold, Asthma, Fever
40.	*Crateva nurvala Buch. Ham.*	□□□□	Capparaceae	Rheumatic Fever, Gastric irritation

41.	*Ziziphus oenoplia (L.) Mill.*	□□□□	Rhamnaceae	Dysentery
42.	*Aristolochia indica L.*	□□□□□	Aristolochiaceae	Boost the Immune system, Snakebite
43.	*Putranjiva roxburghii L.*	□□□□□□□□□□	Putranjivaceae	Skin Ailment
44.	*Rauvolfia serpentine (L.) Benth. ex Kurz*	□□□□□□□□	Apocynaceae	High blood pressure, Asthma
45.	*Pandanus amaryllifolius Roxb.*	□□□□□	Pandanaceae	Chest pains, Reduce fevers
46.	*Baliospermum montanum L.*	□□□□	Euphorbiaceae	Purgative, Anthelmentic
47.	*Limonia acidissima L.*	□□□	Rutaceae	Tonic for heart and lungs
48.	*Withania somnifera (L.) Dunal*	□□□□□□□□	Solanaceae	Lower blood pressure
49.	*Lagerstroemia speciosa (L.) Pers.*	□□□□□□	Lythraceae	Anti – oxidant
50.	*Grewia asiatica L.*	□□□□□	Malvaceae	Treating throat, tuberculosis
51.	*Carica papaya L.*	□□□	Caricaceae	Increase the count of white blood cells and platelets
52.	*Barringtonia acutangula (L.) Gaertn.*	□□□□□□□□	Lecythidaceae	Cough, Diarrhea, Fever.
53.	*Mesua ferrea L.*	नागचाफा	Calophyllaceae	Antiseptic, Anti-inflammatory, Blood purifier
54.	*Polypodium qercifolium*	बाशिंगी	Polypodiaceae	Skin Ailment
55.	*Artemisia vulgaris L. C.B. Clarke Mattf.*	□□□□□□□	Asteraceae	Antiparasitic

56.	*Abrus precatorius L.*	□□□□	Fabaceae	Anti Diabetic
57.	*Phyllanthus amarus Schumach.*	□□□□□□□	Phyllanthaceae	Gallstones and Kidney stones
58.	*Terminalia arjuna Roxb.*	□□□□□□	Combretaceae	Antioxidant, Anti-Carcinogenic
59.	*Syzygium aromaticum (L.) Merr.*	□□□□	Myrtaceae	Asthma, Bronchitis, Anti - Acidic
60.	*Celastrus paniculatus Willd.*	□□□□□□□□□□	Celastraceae	Anti-arthritic, Wound healing
61.	*Pterocarpus marsupium Roxburgh*	□□□□□	Fabaceae	Antibiotic, Hypoglycaemic
62.	*Senegalia catechu (L.f.) P.J.H.Hurter & Mabb.*	□□□	Fabaceae	Osteoarthritis
63.	*Cordia dichotoma G.Forst.*	□□□□	Boraginaceae	Anthelmintic
64.	*Erythrina corallodendron L.*	□□□□□□□	Fabaceae	Anti carcinogenic
65.	*Bauhinia racemosa L.*	□□□□	Fabaceae	Anti-carcinogenic, Anti-inflammatory
66.	*Calophyllum inophyllum L.*	□□□□	Calophyllaceae	Fish poison
67.	*Moringa oleifera Lam.*	□□□□□	Moringaceae	Antioxidant
68.	*Curcuma amada Roxburgh*	□□□□□□□	Zingiberaceae	Antioxidant, Antibacterial
69.	*Premna serratofolia L.*	□□□□□□□□	Lamiaceae	Anti – Inflammatory
70.	*Semecarpus anacardium L.f.*	□□□□□□	Anacardiaceae	Digestive disorders
71.	*Terminalia bellirica (Gaertn.) Roxb.*	□□□□□	Combretaceae	Antioxidant (Triphala)

72.	*Kaempferia rotunda L.*	□□□□□□□	Zingiberaceae	Anti - Inflammatory, Analgesic
73.	*Myristica fragrans Houtt.*	□□□□□	Myristicaceae	Antiseptic, Analgesic
74.	*Embelia roubusta Burm.f.*	□□□□	Primulaceae	Antimicrobial, Antioxidant
75.	*Oroxylum indicum (L.) Benth. ex Kurz*	□□□□	Bignoniaceae	Astringent, Tonic, Anti-diarrhoeal
76.	*Memecylon umbellatum Burm.f.*	□□□□	Melastomataceae	Herpes, Diabetes, Cough
77.	*Cinnamomum zeylanicum J.Presl*	□□□□□□□	Lauraceae	Spice
78.	*Cinnamomum tamala Buch.Ham.*	□□□□□□□□	Lauraceae	Spice
79.	*Areca catechu L.*	□□□□□□	Arecaceae	Mouth Freshener
80.	*Hemidesmus indicus (L.) R.Br.*	□□□□□□□	Apocynaceae	Astringent, Blood purifier
81.	*Saraca indica L.*	□□□□□□ □□□□	Fabaceae	Antioxidants, Hematoprotective
82.	*Aegle marmelos L.*	□□□	Rutaceae	Dysentery, Diabetes
83.	*Cissus quadrangularis L.*	□□□□□ □□□□□□	Vitaceae	bone health, Diabetes
84.	*Santalum album L.*	□□□□	Santalaceae	Anti - Inflammatory, Skin diseases
85.	*Clerodendrum infortunatum L.*	□□□□□□	Lamiaceae	Rheumatism, Swelling
86.	*Tylophora indica (Burm. f.) Merr.*	□□□□□	Apocynaceae	Asthma, Expectorant

87.	*Cheilocostus speciosus J.Konig*	□□□□□	Costaceae	Kidney problems
88.	*Desmodium gangeticum (L.) DC.*	□□□□□□	Fabaceae	Febrifuge, Diuretic
89	*Embelia ribes Burm.f.*	वावडींग	Primulaceae	**Anthelmintic**
90	*Acorus calamus L.*	वेखंड	Acoraceae	Antioxidant, Anti-inflammatory
91.	*Abelmoschus ficulneus (L.) Wight*	□□□□□□□□	Malvaceae	Antibacterial
92.	*Barleria prionitis L.*	□□□□□□□□□□	Acanthaceae	Dental problems and gout
93.	*Cassia alata L.*	□□□□□	Fabaceae	Skin recovery , Stomach infection
94.	*Terminalia catappa L.*	बदाम	Combretaceae	Antioxidant
95.	*Ixora coccinea L.*	देव्हारी	Rubiaceae	Skin disease, Fever
96.	*Helicteres canescens L.*	मुरुडशेंग	Sterculiaceae	Snake bite, Abdominal swelling
97.	*Asclepias curassavica L.*	हळदीकुंकू	Apocynaceae	Antioxidant
98.	*Crotalaria retusa L.*	खुळखुळा	Fabaceae	Fever, Lung diseases
99.	*Barleria involucrata elata Dalzell C.B.Clarke*	जांभलीकोरंटी	Acanthaceae	Diabetes
100.	*Sesbania sesba L.*	जायंटकरोति	Fabaceae	Scorpion sting
101.	*Caryota urens L.*	□□□□□□	Areceae	Cool and Nutritious
102.	*Allocasia indica L.*	□□□□□□	Areceae	Antioxidant Cytotoxic
103.	*Grewia tiliifolia Burrett*	□□□□	Tiliaceae	Cough, Anti-carcinogenic

104.	*Celastrus paniculatus*	□□□□□□□□□□	Celastraceae	Amnesia, Leprosy
105.	*Bombax ceiba L.*	□□□□□□□□	Bombacaceae	Dysentery, Haemoptysis
106.	*Maranta arundicacea L.*	□□□□□□	Marantaceae	Skin disorders and Stomachache
107.	*Elettaria cardamomum*	□□□□□□□	Zingiberaceae	Spice
108.	*Actinodaphne quinqueflora*	□□□□□□□	Lauraceae	Gastrointestinal, Ailments

Recommendation:

- Encourage the faculties and students to plant trees in the garden.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic
- Dispose the chemical waste generated from the laboratories in a scientific manner.
- Create "Green Team" in the institution to increase awareness among students.
- E Publishing reviews of new green resources in the newsletter or news.
- Recycling beyond paper i.e. plastic, e- waste.

D] WASTE MANAGEMENT

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, glass, dust etc. 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 present Prime Minister of India Sri Narendra Modi launched 'Swachh Bharat Abhiyan' (Clean India Mission) on 2nd October, 2014. In this mission, the proper use of dust/waste bins is one of the major priorities. For the implementation of this mission, collective mass effort is necessary. For proper segregation and management, proper use of waste bins is the only solution for waste management purpose in the college campuses.

VERMICOMPOSTING:

Vermicomposting is an environment friendly, low-technology method for the disposal of organic waste. It is the process in which the worms are used to convert the organic materials (usually wastes) into a humus-like material which is known as the vermin-compost.

It is one of the easiest methods to recycle agricultural wastes and to produce quality compost. The resultant vermicompost produced is very beneficial for plant growth and health. The values, fertility and productivity of organic waste which has been returned to soil can be improved by beneficial impacts on soil resources and other processes. The production of organic wastes by the use of vermin compost technology is remarkably an effective technology for the reduction in processing time and also beneficial for the production of nutrients which are essential for the plants growth.

It is a key component of the integrated plant nutrient supply system in order to maintain a healthy fertilization system along with maintaining safety. This organic fertilizer is considered to be present in both agriculture and horticulture as an alternative to the inorganic fertilizers in greenhouse.

Preparation of bed for vermin-composting

Quantity of Waste generated:

Biodegradables - 1kg/Day (office,classrooms)

Non Biodegradables – 1 & ½ kg/Day (office, classrooms)

Biodegradable- 1kg/day(labs)

Non- Biodegradable- ½ kg /Day (including glass bottles)

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Hazardous waste-150gm/Day

Canteen waste: Biodegradables- 20kg/Day

Non- Biodegradables – ½ kg/Day

Total Waste:

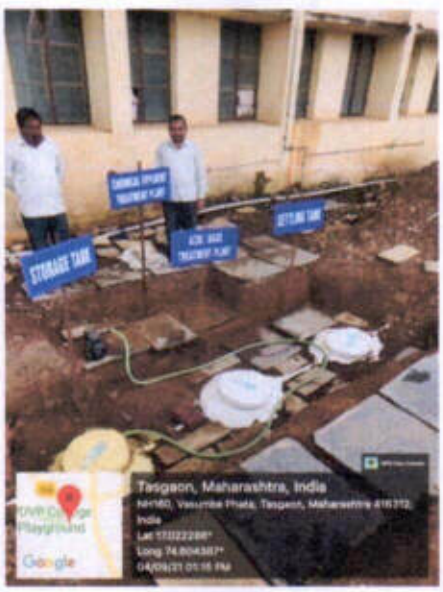
Biodegradable waste – 22kg/Day Non- Biodegradables- 2 ¾ kg/Day Hazardous waste – 150 grams/ Day

Skill Oriented Training Programme for non teaching staff on 'Vermicomposting organized by Department of Zoology.had organized a 30 days training programme, from 22nd July 2020 to 21st August , 2020 on 'Vermicomposting' to cover a total duration of 200 hours. The said training programme imparted theory as well as practical (hand-on) exposure on vermicomposting and management of organic wastes in agriculture for productivity improvement and livelihood security.

CHEMICAL EFFLUENT TREATMENT PLANT:

PDVP college is committed to the green campus philosophy and to saving the precious treasure of nature. This chemical effluent treatment plant consists of all the process units which help to minimize the chemical and biological load.

This is used to treat waste water coming out from chemistry department. Effluent Treatment Plant (ETP) is a process design for treating the chemical waste for its reused or safe disposal to the environment.



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Audit Observations:

- The college does not have any such recycling device to carry on the waste recycle procedure.
- The college has set up separate bins to ensure proper segregation and collection of the various wastes. The responsibility of recyclable waste is however still not taken up the college.
- The college organized several seminar and community program by the departments to ensure both consciousness and awareness among students and community members.
- All dry wastes (paper, metal, glass, other dry waste, e-waste, etc.)are separated in different bins in the college and resell to the local vendor

Sr. No	Area	No of Waste bins
1.	Art Campus	2
2.	Science campus	2
3.	Commerce campus	2
4.	Hostel Ladies	2
5.	Canteen	3

Recommendation:

- Make full use of all recycling facilities provided by Gram Panchayat and private suppliers, including glass, cans, white and brown paper, batteries, print cartridges, cardboard and furniture.
- The color coded bins for different wastes are placed at different locations of the campus for collection of waste and its easy sorting at source.
- Compost or cause to be composted, all organic waste, green waste and non-recycled collected from kitchens, gardens, offices and rooms.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated
- Dispose all waste, whether solid or otherwise, in a scientific manner and ensure that it is not released directly to the environment
- Recycle and reuse of kitchen wastes (from canteen and hostels) and garden waste

E] CARBON FOOTPRINT

- **Solar water heater at hostel:**

Resident: 100

Assuming an average requirement of 20 L of hot water per day Thus daily amount of hot water used= 100x20 = 2000 L

An average flat plate collector area of 2 m^2 gives 125L of hot water per day. Required collector plate area = 16 m2

Available collector plate area = 20m2

Solar water heater is successfully used in Girls hostel

Use of Renewable Energy:

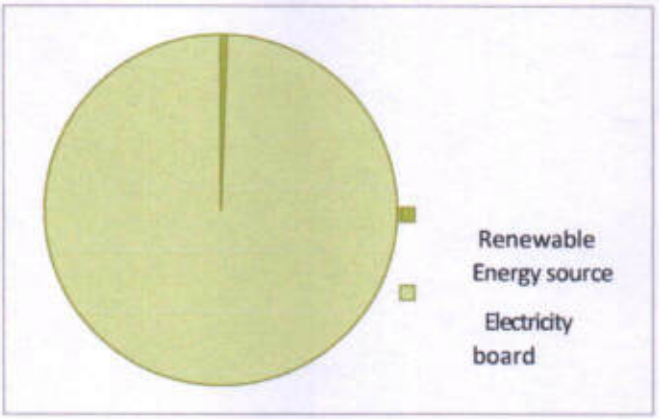
Hybrid (Solar with wind miles) energy generation system is available in college campus. The device has rated power 2KW.

Assuming total working hours -4 hours

Total kWh or units energy obtained from renewable source is 8 kWh Equipment working on renewable energy

Sr. No	Equipment	Quantity	Actual consumption by equipment	Total Energy consumption in kWh or units
1.	Computer	1	520 W	520W x 4 = 2080Wh 2.08kWh
2.	Printer	1	200 W	200W x 4 = 800Wh 0.8 kWh
3.	Tube light	2	40 W	80W x 4 = 320Wh 0.32 kWh
4.	Fan	2	78 W	156W x 4 = 624Wh 0.624 kWh
			Total	5.736 kWh

total daily energy consumption by Renewable Energy source = 3.824 kWh Therefore monthly energy consumption by Renewable Energy source = 21.92 kWh Monthly Average energy consumption by Electricity board = 3862.25 kWh



Audit Observations:

- About 60% of the students and teaching and non-teaching staffs of the college use bicycle as the main mode of transport. The college also encourages transport by bicycle to students. Collegeencourages
- UGC projects on sustainable development/ natural resources. There is compulsory ENVS paper of 100 marks in the University Syllabus for all the students of all streams to develop Environmental Awareness.
- College does not directly or indirectly participate in depletion and degradation of natural resources
- Seminars and awareness programs are conducted periodically on nature and natural resources.

Recommendation:

- Ensure use of ecofriendly transport option
- Review architecture of existing buildings and
- reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage.
- Conduct environmental awareness potsters. and seminars as a part of the program

PHOTOGHAPHS

Tree Plantation:

CONCLUSION

A green audit provides a comprehensive evaluation of an organization's environmental practices, identifying areas where improvements can be made to reduce environmental impact and promote sustainability. Concluding a green audit involves summarizing the findings, highlighting key successes and offering actionable recommendations for enhancing environmental performance. It should emphasize the importance of ongoing commitment to sustainable practices and continuous improvement. By implementing the recommendations, the organization can not only reduce its ecological footprint but also potentially realize cost saving, enhance its reputation, and contribute positively to the broader community and environment. Regular green audits should be scheduled to ensure that progress is tracked and new opportunities for improvement are identified.

Mrs. D.S. Patil (EA-31840)
BE(Mech) MTech(Energy)
Bureau of Energy Efficiency (BEE)
Certified Energy Auditor and Manager

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5/22, 'Prashant' ZP Colony,
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BEE Certified Energy Auditor EA-31840
SANGLI

P.D.V.P. MAHAVIDYALAYA
TASGAON, DIST. SANGLI

DS Energy Consultancy and Services

Certificate of Completion

Green and Environmental Audit

This certifies that

A detailed Green and Environmental Audit for **Padmabhushan Dr.Vasantraodada Patil Mahavidyalaya, Tasgaon** has been conducted for the year **2023-24** to assess the green initiative planning, efforts, activities implemented in the campus like Swach Bharat Abhiyan, plantation Segregation of waste etc.

The activities and measures carried out by the institute have been verified and found to be satisfactory, some recommendations are given in the report. The efforts taken by the institute, faculty and students are highly commendable.

Dhanashri Patil
Certified Energy Auditor and Manager (EA 31840)
Bureau of Energy Efficiency

Date
July 23,2024

P.D.V.P. MAHAVIDYALAYA TASGAON, DIST. SANGLI

Certificate of Compliance

This is to certify that the

Conformity Assessment Certification

of

DS ENERGY CONSULTANCY AND SERVICES

at

5/29, 'PRASHANT', ZP COLONY, NEAR WARNALI, VISHRAMBAG, SANGLI, MAHARASHTRA PIN 416415, INDIA

has been independently assessed and is compliant with the requirements of:

ISO/IEC 17020:2012

For the following scope of activities:

THIRD PARTY INSPECTION SERVICES FOR WALKTHROUGH AND DETAILED ENERGY AUDIT, GREEN AUDIT AND ENVIRONMENTAL AUDIT FOR COMMERCIAL BUILDINGS, INDUSTRIES , EDUCATIONAL INSTITUTES LIKE COLLEGES AND UNIVERSITIES , POWER QUANTITY AUDIT AND HARMONIC STUDIES , ENERGY AND LOAD MONITORING SERVICES , THERMOGRAPHY, ENERGY MANAGEMENT SYSTEM , AIR QUALITY TESTING , DATA WARE HOUSING , WATER AUDIT, RENEWABLE ENERGY ADVISORY, HEALTH CHECK UP OF PLANT EQUIPMENTS.

Certificate Number: UQ - 2024011219

Validity of this certificate can be verified at www.ukcertifications.org.uk

Date of Certification	12th January 20
1st Surveillance Audit Due	11th January 2025
2nd Surveillance Audit Due	11th January 2026
Certificate Expiry	11th January 2027

Authorised Signatory

P. D. V. P. MAHAVIDYALAYA TASGAON, DIST. SANGLI