Green/Environmental Audit Report

Dr. Yeshawant Moreshwar Donde Sarwajanik Shaikshanik Trust's

INDIRA MAHAVIDYALAYA

KALAMB, DIST. YAVATMAL, MAHARASHTRA 445401

Duration of Audit: August 2023 to October 2023
Assessment Period: 2020-21, 2021-2022, 2022-23
Dated this 30th day of October 2023

Prepared by

GREEN ENERGY SOLUTIONS

Authorised Energy and Environment Auditing Agency
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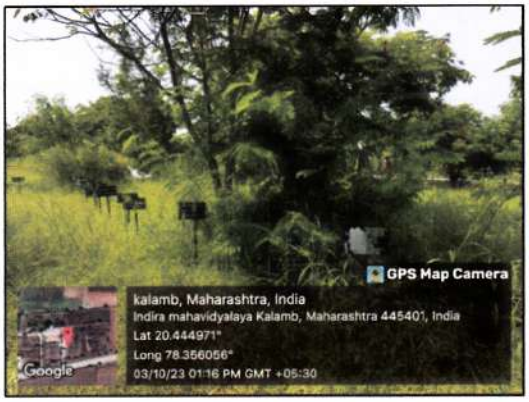
This document contains the survey report of activities that **Green Energy Solutions** has performed in **Indira Mahavidyalaya, Kalamb, Dist. Yavatmal**, premises under Green Audit. This report includes observations that agency has come across, and also recommendation and solutions for it which can be implemented to enhance the overall performance of the college.



Acknowledgment

We were privileged to work together with the administration, staff and students of Indira Mahavidyalaya, Kalamb, Dist. Yavatmal for their timely help extended to complete the audit and bringing out this report.

With gratitude, we acknowledge the diligent effort and commitments of all those who have helped to bring out this report. We also take this opportunity to thank the bona-fide efforts of team Green Energy Solutions for unstinted support in carrying out this audit. We thank our consultants, engineers and backup staff for their dedication to bring this report.

Thank you!

Date: 30/10/2023

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(Prabhakar P. Patil)
Director, GES
Prabhakar P. Patil
Director
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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. 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.

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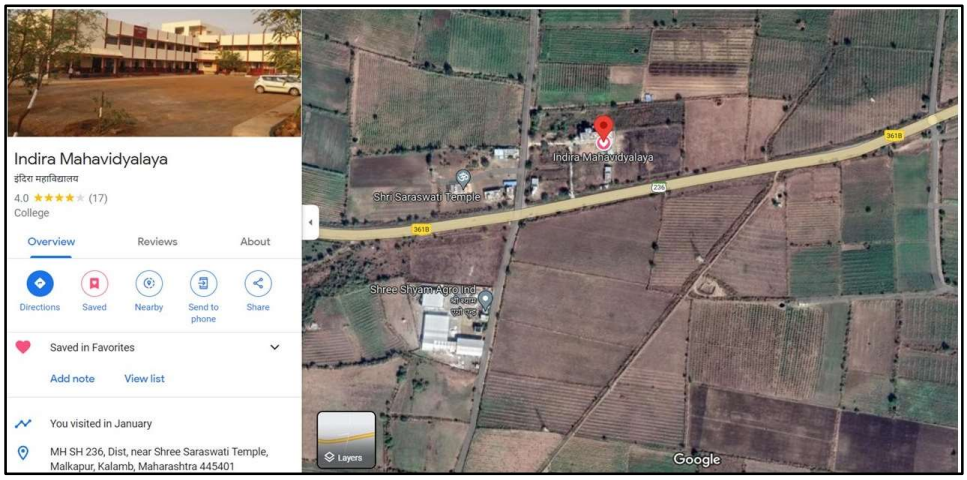
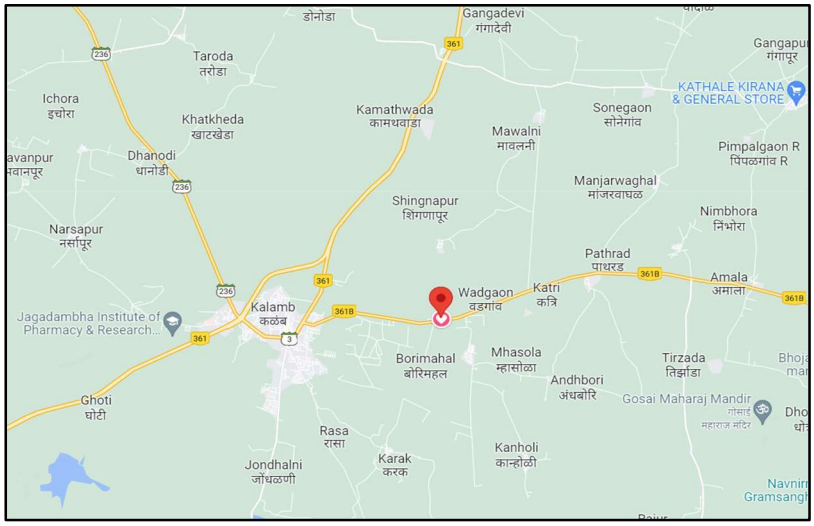
Location

Indira Mahavidyalaya is locatied on Kalamb-Ralegaon Road, Near Shree Saraswati Temple, Kalmb, Dist. Yavatmal (Maharashtra).

Country and State	India, Mahrarashtra
District	Yavatmal
Taluka	Kalamb
Government Type	Nagar Panchayat
Metropolis	10 Acers
Population of Taluka	135,992
Population of City	17447
Pin code	445401
Official language	Marathi
Location	20.4452° N, 78.3245° E

Satellite Image / Map





Executive summary

India has experienced revolutionary rapid industrial growth and urbanization over the past few decades. Due to this, we are observing severe depletion of natural resources, damages to the ecosystems and habitats, heavily polluted surface and ground water resources as well as resources such as soil and air etc. This has almost resulted in irreversible changes which might damage the eco-system and will enhance climate change and create diseases which will be difficult to control, if proper effective measures are not taken in time or if continuous vigilance is not maintained.

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 the developing countries like India, the educational institutions have been playing a significant role in promoting social inclusiveness, economic growth and environmental protection directly or indirectly and thus have been contributing to nation's growth since the time unknown. These institutes are indirectly aiming to achieve sustainable development goals which has become necessary in the current scenario.

Most of the educational institutions are thriving to provide a clean and healthy environment and are becoming more sensitive to the maintenance and sustenance of the environment within their campus by promoting good practices such as energy savings, recycling of waste, water management etc. However, these efforts are to be accounted for to the benefit of all the stakeholders associated with an institute. Such accounting will ensure a continuous vigilance with respect to environmental performance of the institute.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2016–17 onwards that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures. In view of the NAAC circular regarding Green Auditing, the College Management decided to conduct an external Green Evaluation by GREEN ENERGY SOLUTIONS.

INDIRA MAHAVIDYALAYA is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher learning, the college has arranged various programmes for the environment protection and sustainability.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The methodology include: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as

the degree to which the Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health and learning college operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

Thanks to the management of Dr. Yashawant Moreshwar Donde Sarwajanik Shaikshanik Trust and Principal of Indira Mahavidyialaya for providing this opportunity to work together towards making day-to-day operations of the institution environmentally sustainable. We thank all the employees who participated in the staff survey and also the students who helped us for gathering the data and also the non-teaching staff and workers who co-operated with us and hope our recommendations will be used to create a model green institution and will benefit the institution for NAAC accreditation.

Date: 30/10/2023

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Disclaimer

GREEN ENERGY SOLUTIONS Team has prepared this report of Green Audit for Indira Mahavidylaya, Kalamb based on input data submitted by the representatives of the college complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered. It is further informed that the conclusions are arrived at following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report. If you wish to distribute copies of this report external to your organization, then all pages must be included. GREEN ENERGY SOLUTIONS, its staff and agents shall keep confidential all information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

Introduction to the Green-Audit Programme

Green audit is the tool of management system used methodically for protection and conservation of the environment. It is also used for the sustenance of the environment. The audit suggests different standard parameters, methods, and projects for environmental protection. It can be adopted by any industry, organization, educational institutes and even by housing complexes. The green audit is useful to detect and monitor sources of environment pollution and it emphasizes on management of all types of wastes, monitoring of energy consumption, monitoring of quality and quantity of water, monitoring of hazards, safety of stakeholders and even the management of disasters.

The green audit was first implemented in the United States in the early 1970s by some companies in commensuration with Clean Air and Clean Water Act. The United Nations Conference on Environment and Development (UNCED), also known a Earth Summit Rio-1992 held at Rio de Janeiro, Brazil inspired the countries to review their environmental stand to act effectively to save the earth with sustainable approach. Most of the participating countries accepted their national strategy for sustainable development which includes the policy and programs aimed to promote geo-biodiversity and protect environment.

INDIA is the first country in the world to make environmental audits compulsory. The government of India, by its gazette notification dated March 13, 1992, made it mandatory for all industries to provide annual environmental audit reports of their operations, beginning with 1992-93. This required industries to provide details of water, raw materials and energy resources used, and the products and waste generated by them.

In 2006, Government of India declared the National Environment Policy 2006 and made green audit mandatory to each industry. According to the policy it is a response to India's national commitment to a clean environment, mandated in the Constitution in Articles 48 A and 51 A (g), strengthened by judicial interpretation of Article 21 (National Environmental Policy 2006). It is recognized that the maintenance of the healthy environment is not the responsibility of the state alone. It is the responsibility of every citizen and thus a spirit of partnership is to be realized through the environment management of the country. The process of environmental audit was formalized by Supreme Audit Institution (SAI) according to the guidelines given in Manual of Standard Orders (MSO) issued by Authority of the Controller and Auditor General of India 2002.

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.

About the College

Dr. Yashawant Moreshwar Donde Sarwajanik Shaikshanik Trust and Indira Mahavidyalaya, Kalamb is 40 years young college having Arts, Commerce, and Science faculty. College is reaccredited with B+ Grade by NAAC. The college is located on a beautiful campus of 10 acres. The college main building is in "L" shape. There are few separate buildings for few departments, canteen, gymnasium, open air theatre etc. There are separate laboratories for Chemistry, Botany, Zoology, Physics, Electronics, Computer Science, Geography, Home Economics, and Psychology. The college has also adopted a system for environmental conservation and sustainability. There are three pillars as zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO_2 emission, energy and water use, while creating an atmosphere where students can learn and be healthy. The college administration works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, and Mapping of Biodiversity.

Objectives of the Study

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:

1. To introduce and aware students to real concerns of environment and its sustainability.
2. 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.
3. 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.
4. To bring out a status report on environmental compliance.

Methodology

In order to perform Green Audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarise the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- E-waste management
- Green area management

PDCA (Plan-Do-Check-Act), sometimes called PDSA (Plan-Do-Study-Act), the "Deming Wheel," or "Deming Cycle," was developed by renowned management consultant Dr. William

Edwards Deming in the 1950s. He called it as the "Shewhart Cycle," as his model was based on an idea from his mentor, Walter Shewhart. He wanted to create a way of identifying what caused products to fail to meet customers' expectations. His solution helps businesses to develop hypotheses about what needs to change, and then test these in a continuous feedback loop.

PDCA/PDSA CYCLE

The four phases are:

Plan: Identify and analyse the problem or opportunity, develop hypotheses about what the issues may be, and decide which one to test.
Do: Test the potential solution, ideally on a small scale, and measure the results.
Check/Study: Study the result, measure effectiveness, and decide whether the hypothesis is supported or not.
Act: If the solution was successful, implement it.

The PDCA / PDSA framework can improve any process or product by breaking it into smaller steps. It is particularly effective for:
Helping to implement Total Quality Management or Six Sigma initiatives, exploring a range of solutions to problems, and piloting them in a controlled way before selecting one for implementation.
Avoiding wastage of resources by rolling out an ineffective solution on a wide scale.
You can use the model in all sorts of business environments, from new product development, project and change management, to product lifecycle and supply chain management.

Benefits of PDCA cycle

The model is a simple, yet powerful way to resolve new and recurring issues in any industry, department or process. Its iterative approach allows you and your team to test solutions and assess results in a waste-reducing cycle.
It instils a commitment to continuous improvement, however small, and can improve efficiency and productivity in a controlled way, without the risks of making large scale, untested changes to your processes.

While performing the green audit, we followed the PDCA cycle. The advantage of these cycle in achieving the goals of continuous improvement of the quality management system.

This report includes 4 stages as per:

Section 1: Plan Phase (Includes Audit Plan)
Section 2: Do and Check Phase (Includes observation)
Section 3: Act Phase (Includes recommendations)

Section 1: Plan Phase

This phase includes proper planning on how and when the audit will be performed. Prior meetings were held with Principal Dr. Pavan Mandavkar and other teaching and non-teaching staff and also with students to inform them about these activities. Following are the details of these Pre-Audit Meetings that were held during initial period in the college seminar hall in two separate sessions for teaching-non teaching staff and the students respectively.

Session I

This session was conducted in the first month itself, under the guidance of by the Director of Green Energy Solutions, Mr. Prabhakar P. Patil, for the students to brief them about the importance of improving the environmental performance of their college through the Green Audit Activity. They were given a brief idea about what Green Audit is and how they can contribute in this process and how it will benefit them and the college. There was a good response as the students were enthusiast to learn about the audit and wanted to work for the betterment of college environment. Students were divided into two task forces and were assigned the data collection tasks.

Session II

On the same day another session was held for the teaching and non-teaching staff in which they were also informed about the same by Mr. Prabhakar P. Patil. There was a good response from teaching and nonteaching members and all were very much interested to participate in this activity.

Section 2: Do and Check Phase

During next 2 months green/environmental, waste, water and energy audit were performed simultaneously. Before collecting the data, the staff members and students were given some instruction on how to collect the data for both the audit. The staff and students performed the task in an excellent and impressive way. The observations that we recorded are all noted in Section 2 phase.

Before performing the audit, the staff was given some instructions on why they are doing this and how they will segregate the waste. They were also provided with gloves and mask to ensure proper safety and to avoid injuries or ill effects. The observations that we recorded are all noted in Section 2 phase.

This phase includes the observations and depending on that we gave marks to it. On basis of this report, we can properly understand in which section we shall focus and which are lacking behind to make improvements in it.

General Environmental Awareness Questioner

Question	Yes/No/NA	Total marks 100
Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes	10
Does your institute have any rules to protect the environment?	No	00
Dose Environmental Ambient Air Quality Monitoring conducted by the Institute?	Yes, Not Regularly	05
Dose Environmental Water and Waste water Quality monitoring conducted by the Institute?	Yes, Not Regularly	05
Dose stack monitoring of DG sets conducted by the Institute?	N/A	00
Is any warning notice, letter issued by state government bodies?	No	10
Dose any Hazardous waste generated by the Institute? If yes explain its category and disposal method.	No	10
Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes	10
Are students and faculties aware of environmental cleanliness ways?	Yes	10
Dose Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes	10
	Marks obtained	**70**

Best Practices and Initiatives

Checklist	Yes/No/NA	Total marks 100
Renewable Energy / Solar Power Plant	No	00
Energy Audit and Green Audit Conducted	Yes	10
Biogas Plant installed	No	00
Biodiversity Conservation	Yes	08
Tree Plantation Drives / ECO clubs	Yes	10
Ground Water Recharge / Rain Water Harvesting System / Water Conservation	Yes	10
Pollution Reduction Initiative / Public Transportation	Yes	07
E Waste Management Connected to authorized recycler	No	00
Solid Waste Management	Yes	08
Adoption of Village for green practices	Yes	10
	Marks obtained	**63**

Landscaping and Plantation

Landscaping: Landscape is an art to develop specific piece of land into green with aesthetic view commonly called as 'beautification'.

Activity: College is having10 acres of land with various buildings such as class rooms, laboratories, canteen, toilet blocks and play grounds. Surrounding area is a bare land of rocks because of water scarcity it was difficult to made campus green, but college developed Eco-friendly campus. Landscaping is done as per requirement. The role of NSS in landscaping and planting is great.

Aims and objectives: Aim and objective of landscape are as below:

Aims:
1) To develop campus eco-friendly.
2) To creates healthy environment for learning.
3) Beautification of Land.

Objectives:
1) Pants provides natural oxygen.
2) Plants keeps surrounding environment clean and cool.
3) Plants protect from dust which are collected on foliage.
4) Trapping of dust on leaves creates dust free environment in building.
5) Increase aesthetic view of the campus
6) Plants are important as it creates natural habitat for birds and animal.

Plantation: Plants provide us oxygen, filter carbon dioxide, prevent soil erosion, maintain the ecological balance and many more. Also, they provide us food, shelter and many useful things.

Aims:
1) To create healthy environment.
2) To develop the natural habitat in the campus.

Objectives:
1) Increase O_2 level of the campus.
2) Keep surrounding environment cool.
3) Plants give shade.
4) Plants gives natural habitat for birds and animals including Microorganism.

Activity/ Observation: Plantation is done regularly in college. As per location, different variety of plans are planted in various places with keeping aesthetic view with respect to type of soil texture. The College has 67 species of plants that are labelled and their growth is monitored. The entire campus has been developed into beautiful garden patches. The total number of herbs is 53, shrubs 112, and trees 139. Efforts are made to increase the number of plants that can survive under adverse condition of soil and scarcity of water.

Recommendations:

Strengthen the Garden Committee that will hold the complete responsibility for the enactment, enforcement and review of the Environmental Policy. The Committee shall be the source of advice and guidance to staff and students on how to implement the policy. Ensure that an audit is conducted regularly and action is taken on the basis of audit report, recommendation and findings. Increase use drip irrigation system for the proper watering to the plants.

Green Belt and Biodiversity

College campus has plenty of trees. Many of the trees are planted to have medicinal importance. There are large number of big trees surrounding the College field. These trees attract various birds and insects which increases the biodiversity of the Campus. And of course, these trees help reducing the temperature level of the College Campus.

Green Area

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

Observations:

Campus is located in the vicinity of approximately 67 types (species) of trees. Various tree plantation programs are being organized during the last week of June, July and August at college campus and surrounding villages through NSS unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various type of indigenous species of ornamental and medicinal wild plant species.

Recommendations:

- Reviews periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Give scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Ensure that an audit is conducted annually or biannually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate 'Environment Day' and other days related to environment and plant trees on these days to make the campus Greener.

Theme localities

Theme	Oxygen -Rich	Beauty	Medicinal	Climbers	Shade	Avenue	Flower Garden
Sacred Fig (Peepal)	✓			✓	✓	✓	✓
Banyan Tree	✓				✓	✓	
Neem	✓		✓				
Guava	✓						
Mango	✓						
Lemon	✓						
Indian Gooseberry	✓						
Almond	✓						
Pomegranate	✓						
Custard Apple	✓						
Banana	✓						
Black Plum (Jamun)	✓						
Fig	✓				✓	✓	
Kadamba	✓						
Plumeria		✓				✓	✓
Jasmine (Mogara)		✓		✓			✓
Oleander (Nerium oleander)		✓					✓
Rose		✓					✓
Gulmohar (Flame Tree)		✓				✓	
Chrysanthemum		✓					✓
Malabar Nut			✓				
White Leadwort			✓				
Holy Basil			✓				
Safflower			✓				
Indian Beech (Pongamia glabra)			✓				
Indigo (Ink Nut)				✓			
Climbers				✓			
Periwinkle							✓

Floral Diversity
Trees available in the college campus

Sr. No.	Common Name	Botanical Name of Plant	No. of trees	Pictures
1	Kadu Nim	*Aazadirachta indica*	30	
2	Chinch	*Tamarindus indica*	10	
3	Ramphal	*Annona reticulata*	1	
4	Sitafal	*Annona squamosa*	10	
5	Saptaparni	*Alstonia scholaris*	4	
6	Bor	*Ziziphus mauritiana*	6	
7	Gulmohar	*Delonix regia*	1	
8	Banyan	*Ficus benghalensis*	3	
9	Mango	*Mangifera indica*	10	
10	Pimpal	*Ficus religiosa*	3	

11	Engraji Chinch	*Pithecellobium dulce*	9	
12	Badam	*Prunus dulcis*	7	
13	Chafa	*Plumeria*	10	
14	Babhul	*Vachellia nilotica*	16	
15	Gauva	*Psidium guajava*	2	

Pictures of Flowering Plants available in college campus

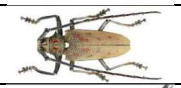
Sr. No.	Common Name	Botanical Name of Plant	No. of plants	Pictures
1	China Rose	*Hibiscus*	10	
2	Nag Champa	*Plumeria Pudica*	3	
3	Sadaphuli (Pink)	*Catharanthus roseus*	25	
4	Sadafuli (White)	*Catharanthus roseus*	23	
5	Chameli	*Yellow plumeria rubra*	2	
6	Nimboo	*Citrus limon*	7	

7	Keli	*Canna spp.*	3	
8	Gulab	*Rosa Damascena*	10	
9	White flowered aak	*Calotropis procera*	1	
10	Purple flowered aak	*Calotropis gigantea*	2	
11	Vidya/ Morpankhi	*Thuja occidentalis L*	1	
12	*Holy basil/* Tulsi	*Ocimum tenuiflorum*	7	
13	Anjeer	*Ficus carica*	2	

Faunal Diversity

The wet season is oppressive and cloudy followed by clear dry season. In general, it is hot most of the months. The hot season prevails for 3 months (Mar-May) whereas after monsoon (June-September) the cold season lasts from November till February. Faunal diversity varies accordingly.

Sr. No.	Common Name	Scientific name:	Image
1	Oriental common grass yellow	Eurema hecabe hecabe	

2	Indian painted Jezebel	*Delias hyparete indica*	
3	Indian angled castor	*Ariadne merione tapestrina*	
4	Damsel Fly	*Ischnura* sp	
5	Dragon Fly	*Aeshna sp*	
6	Rice Grasshoppers	*Oxya sp*	
7	Field Cricket	*Gryllus sp*	
8	Mole Cricket	*Gryllotalpa sp*	
9	Mango Stem Borer	*Batocera rufomaculata*	
10	Oriental magpie-robin	*Copsychus saularis*	
11	House sparrow	*Passer domesticus*	
12	Woodpecker (Lesser Golden-backed Woodpecker)	*Dinopium benghalense*	
13	Common crow	*Corvus splendens*	
14	Jungle Babbler	*Argya striata*	
15	Purple sunbird	*Nectarinia sp*	

16	Spotted dove	*Spilopelia sp*	
17	Jungle Myna	*Acridotheres fuscus*	

Various Faunal Diversity around the College Campus

Sr.No.	Category	Name of Animal	Scientific Name
1	Birds	House Sparrow	*Passer domesticus*
2	Birds	Common Myna	*Acridotheres tristis*
3	Birds	House Crow	*Corvus splendens*
4	Birds	Rock Pigeon	*Columba livia*
5	Birds	Black Kite	*Milvus migrans*
6	Birds	Eagles	*Various species in Aquila and Haliaeetus genera*
7	Mammals	Cattle	*Bos taurus*
8	Mammals	Buffalo	*Bubalus bubalis*
9	Mammals	Goat	*Capra aegagrus hircus*
10	Mammals	Rabbit	*Oryctolagus cuniculus*
11	Mammals	Hedgehog	*Erinaceus europaeus*
12	Insects	Honeybee	*Apis mellifera*
13	Insects	Butterflies	*Various species*
14	Insects	Ladybugs	*Family Coccinellidae*
15	Insects	Spiders	*Various species*
16	Insects	Mantises	*Order Mantodea*
17	Insects	Dragonflies	*Order Odonata*
18	Amphibians	Frogs	*Various Rana and Duttaphrynus species*
19	Amphibians	Indian Toad	*Duttaphrynus melanostictus*
20	Amphibians	Indian Bullfrog	*Hoplobatrachus tigerinus*
21	Reptiles	Rat Snake	*Ptyas mucosa*
22	Reptiles	Spectacled Cobra	*Naja naja*
23	Reptiles	Russell's Viper	*Daboia russelii*
24	Rodents	House Rat	*Rattus rattus*
25	Rodents	House Mouse	*Mus musculus*
26	Rodents	Indian Gerbil	*Tatera indica*
27	Rodents	Indian Hare	*Lepus nigricollis*
28	Soil Fauna	Common Earthworm	*Lumbricus terrestris*
29	Soil Fauna	Bacteria and Fungi	*Various species*

30	Soil Fauna	Nematodes and Protozoa	*Various species*
31	Aquatic Fauna	Fish	*Various species*
32	Aquatic Fauna	Frogs	*Various species*
33	Aquatic Fauna	Aquatic Insects (Dragonfly Nymphs)	*Various species*
34	Gastropods	Common Garden Snail	*Helix aspersa*
35	Gastropods	Slugs	*Various species*
36	Gastropods	Land Snails (in moist areas)	*Various species*

List of some Plants having Medicinal uses in the college campus

Sr. No.	Marathi Common Name	Number	English Common Name	Scientific Name	Plant Type	Medicinal Uses
1	अडुळसा (Adulsa)	3	Malabar Nut	Justicia adhatoda	Herb	Treats respiratory disorders, cough, asthma,
2	निळी रुई (Nilii Rui)	2	Indigo	Indigofera tinctoria	Herb	- Used for dyeing and in traditional medicine.
3	पांढरी रुई (Pandhari Rui)	1	White Leadwort	Plumbago zeylanica	Herb	- Traditional use in herbal medicine.
4	कडूलिंबा (Kadulimba)	30	Neem	Azadirachta indica	Herb	- Used for skin conditions, dental care, and more.
5	पारिजात (Khadasani)	2	Indigo (Ink Nut)	Wrightia tinctoria	Herb	- Used in traditional remedies for various health issues.
6	चक्री (Chakri)	10	Wheel Bush	Cassia tora	Herb	- Traditional use in Ayurvedic medicine for various ailments.
7	पिंपळकवला (Pimpalkavala)	2	Sacred Fig (Peepal)	Ficus religiosa	Herb	- Traditional remedies for several health conditions.
9	तुळस (Tulasi)	1	Holy Basil	Ocimum sanctum	Herb	- Used for various health and medicinal purposes.
10	डाळिंब (Daalimb)	2	Pomegranate	Punica granatum	Herb	- Consumed for its nutritional and potential health benefits.
11	हाडा शंक (Hada Shank)	1	Pongamia	Pongamia pinnata	Shrub	- Used for skin diseases and as a

						remedy for various ailments.
12	चाफा (Chafa)	10	Plumeria	Plumeria spp.	Shrub	- Used in traditional medicine for skin conditions.
13	पांढरी सदाफुली (Pandhari Sadafuli)	25	White	Hibiscus arnottianus	Shrub	- Traditional use in herbal medicine.
14	लाल जास्वंद (Laal Jaswand)	10	Red Hibiscus	Hibiscus rosa-sinensis	Shrub	- Traditional remedies for various health conditions.
15	खंडचक्का (Khandchakka)	3	Safflower	Carthamus tinctorius	Shrub	- Traditional use in Ayurveda and herbal medicine.
16	चंपा (Champa)	15	Plumeria	Plumeria spp.	Shrub	- Used in traditional medicine for skin conditions.
17	सागवान (Saagwan)	15	Teak	Tectona grandis	Shrub	- Traditional uses in Ayurveda and herbal medicine.
18	जांब (Jaamb)	4	Guava	Psidium guajava	Shrub	- Various parts of the guava tree used in traditional remedies.
19	बेल (Bel)	1	Bael	Aegle marmelos	Shrub	- Used to treat digestive and respiratory conditions.
20	शिरास (Shiras)	2	Jackfruit	Artocarpus heterophyllus	Shrub	- Traditional uses in Ayurveda and herbal medicine.
21	चिंच (Chinch)	10	Tamarind	Tamarindus indica	Shrub	- Used in traditional remedies for various health issues.
22	पापळा (Papala)	4	Papaya	Carica papaya	Shrub	- Consumed for its nutritional and potential health benefits.
23	पळस (Palas)	1	Flame of the Forest	Butea monosperma	Shrub	- Traditional use in Ayurveda and herbal medicine.
24	कदंब (Kadamb)	1	Kadamba	Neolamarckia cadamba	Shrub	- Traditional uses in Ayurveda and herbal medicine.
25	मोगरा (Mogara)	10	Jasmine (Mogara)	Jasminum spp.	Shrub	- Traditional uses in herbal medicine and aromatherapy.

26	पांढरा कनेर (Pandhara Kaner)	5	Oleander (Nerium oleander)	Nerium oleander	Tree	- Traditional use in herbal medicine (caution: highly toxic).
27	सिताफळ (Sitaphal)	10	Custard Apple (Annona reticulata)	Annona reticulata	Tree	- Used in traditional medicine for various ailments.
29	करंजी (Karunje)	20	Indian Beech (Pongamia glabra)	Pongamia glabra	Tree	- Traditional use for skin diseases and as a remedy for various ailments.
30	गुलाब (Gulab)	10	Rose (Rosa spp.)	Rosa spp.	Tree	- Traditional uses for fragrance and various health benefits.
31	बाडवा (Baadwa)	2	Banyan Tree (Ficus benghalensis)	Ficus benghalensis	Tree	- Various parts of the banyan tree have medicinal properties.
32	सदाफुली (Sadafuli)	25	Periwinkle	Vinca Rosea	Tree	- Traditional remedies for various health conditions.
33	लाल कनेर (Laal Kaner)	2	Red Oleander (Nerium oleander)	Nerium oleander	Tree	- Traditional use in herbal medicine. Caution: Highly toxic.
34	शेवंती (Shevanti)	20	Chrysanthemum (Chrysanthemum spp.)	Chrysanthemum spp.	Tree	- Traditional uses in herbal medicine and tea preparation.
35	पिंपळ (Pimpal)	3	Sacred Fig (Peepal) (Ficus religiosa)	Ficus religiosa	Tree	- Traditional remedies for several health conditions.
36	बादाम (Baadam)	7	Almond (Prunus dulcis)	Prunus dulcis	Tree	- Consumed for its nutritional and potential health benefits.
37	आंबा (Aamba)	10	Mango (Mangifera indica)	Mangifera indica	Tree	- Various parts of the mango tree are used in traditional remedies.
38	लिंबू (Limbu)	7	Lemon (Citrus limon)	Citrus limon	Tree	- Used for its refreshing juice and potential health benefits.
39	आवळा (Aawla)	9	Indian Gooseberry (Phyllanthus emblica)	Phyllanthus emblica	Tree	- Consumed for its high vitamin C content and potential health benefits.

40	गुलमोहर (Gulmohar)	1	Gulmohar (Flame Tree) (Delonix regia)	Delonix regia	Tree	- Traditional use in Ayurveda and herbal medicine.
41	केळी (Keli)	3	Banana (Musa spp.)	Musa spp.	Tree	- Traditional uses for various health conditions.
42	जांभूळ (Jambhul)	3	Black Plum (Jamun) (Syzygium cumini)	Syzygium cumini	Tree	- Traditional use in Ayurveda and herbal medicine.
43	अंजीर (Anjeer)	2	Fig (Ficus carica)	Ficus carica	Tree	- Traditional use in herbal medicine.

Total Strength of the college (Input Data)

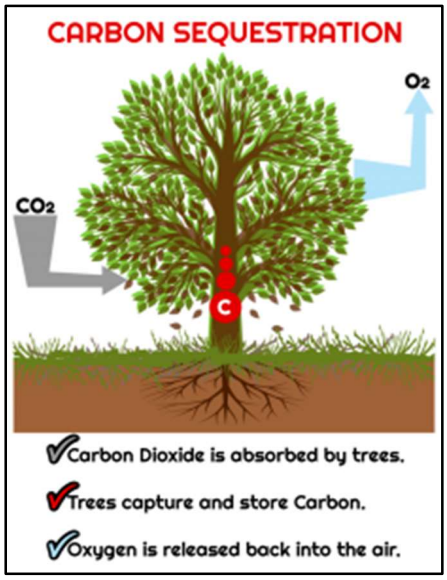
Session	2020-21	2021-22	2022-23
No. of total Students	1284	1181	1138
Teaching Staff	23	22	28
Non-Teaching Staff	12	12	11
Total Occupancy of the college	1319	1215	1277

Air Quality Analysis

Carbon emission and Carbon sequestration

All the activities including energy consumption and waste management have their equivalent carbon emission and they positively contribute to the carbon footprint of the campus. Carbon sequestration is the reverse process, at which the emitted carbon dioxide will get sequestrated according to the type of carbon sequestration employed. Even though there are many natural sequestration processes are involved in a campus, the major type of sequestration among them is the carbon sequestration by trees.

Trees sequestrate carbon dioxide through the biochemical process of photosynthesis and it is stored as carbon in their trunk, branches, leaves and roots. The amount of carbon sequestrated by a tree can be calculated by different methods. In this study, the volumetric approach was taken into account, thus the details including CBH (Circumference at Breast Height), height, average age, and total number of the trees, are required. Details of the trees in the campus compound are given in the Table. Detailed table is included in the technical supplement.



Carbon sequestrated by a tree can be found out by using different methods. Since this study is employed the volumetric approach, the calculation consists of five processes.

1. Determining the total weight of the tree
2. Determining the dry weight of the tree
3. Determining the weight of carbon in the tree
4. Determining the weight of CO_2 sequestrated in the tree
5. Determining the weight of CO_2 sequestrated in the tree per year

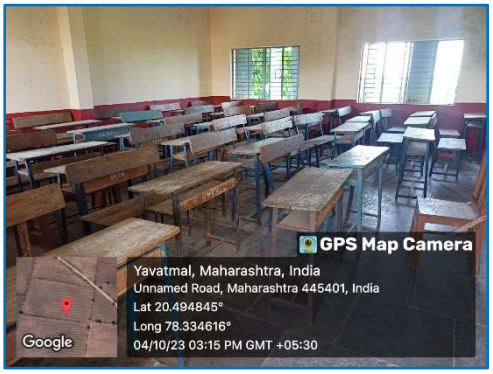
Carbon sequestrated by each species of trees in the campus compound is given in the Table. Detailed calculation results are listed out in the tables provided in the technical supplements of 'Carbon sequestration'.

Observations:

Carbon Sequestration			
Session	2020-21	2021-22	2022-23
Total number of trees	**110**	**125**	**139**
Carbon sequestrated by trees in the campus (tCO2e)	**0.61**	**0.66**	**0.82**

Good daylight design and ventilation

Class rooms, laboratories, office, seminar hall etc. include high ceiling, wide windows and doors. These features help providing ample sunlight which in turn saves electricity. Also, cross ventilation in classrooms and offices are facilitated due to wider windows in parallel walls.



Air Quality Index- 93 (Quality Moderate)

The air quality is generally acceptable for most individuals. However, sensitive groups may experience minor to moderate symptoms from long-term exposure.

Current Air Pollutants	Air Quality Scale	Category
O3	22 (53 µg/m³)	Unhealthy
SO2	7 (7 µg/m³)	Excellent
PM10	105 (87 µg/m³)	Unhealthy
PM2.5	130 (48 µg/m³)	Excellent
NO2	23 (12 µg/m³ µ/gm³)	Fair
CO	3 (284 µg/m³)	Excellent

Source: www.accuweather.com (Place: Kalamb, Date: 23/10/2023)

Per capita carbon emission

Carbon Emission Profile

Carbon emissions in the campus due to the day-to-day activities are calculated and is discussed below. The emission factors considered for estimation and its units are given.

Emission Factors

Item	Factor	Unit
Electricity	0.00079	tCo2e/kWh
LPG	0.0015	tCo2e/kg
Food Waste	0.00063	tCo2e/kg
Paper Waste	0.00056	tCo2e/kg
Plastic Waste	0.00034	tCo2e/kg

Carbon Foot Print

(Refer the charts of Degradable waste generation and Solid non-degradable waste generation)

Sr. No.	Particulars	2020-21	tCO2e	2021-22	tCO2e	2022-23	tCO2e
1	Electricity (kWh)	1306	1.03	2193	1.73	4826	3.81
2	LPG (kg)	14.2	0.02	28.4	0.04	28.4	0.04
3	Degradable Waste in kg/yr.	2328.7	2.16	1569.5	1.99	2022.1	2.09
4	Paper Waste in kg/yr	62.77	0.04	59.39	0.04	61.47	0.04
5	Plastic Waste in kg/yr	35.61	0.04	33.66	0.04	34.83	0.04

Noise Level Analysis

The sound quality in a work place is very important and affects the productivity of the candidates, in this case of students and college staffs. As per Indian standards the desirable noise pollution for educational institutions and hospitals in daytime is 50 dbA.

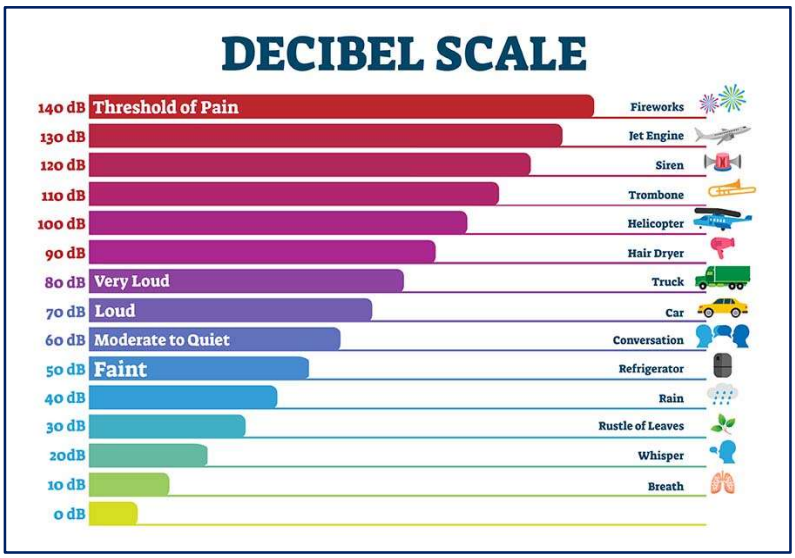
Loudness is the strength of sensation of sound perceived by the individual. It is measured in units of Decibels. includes: Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-100 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level up to 65 dB is considered tolerate. Loudness is also expressed in sones. One sone equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibrations per second. It is denoted as Hertz (Hz).

Noise Test Methods

In this report, Sound Meter (a noise measuring app) has been used to measure the noise level at various location of the college campus. Sound Meter detects any noise, music or sound of its surroundings. The measured data can be analysed to have maximum, minimum and average sound level at the locations considered.

Measurement and observations

The noise level was recorded by Sound Meter at various locations of Indira Mahavidyalya. At each spot, the measurements were taken for 60 seconds during daytime (6 AM- 6 PM). Screen shots of the measurements of noise were taken immediately on the app at the time of 60th second of each measurement.



The noise level is found increased during peak hours of rush, mostly at lectures and or practical time. It is below the minimum level during morning and evening time, beyond the duty hours of teaching and non-teaching staff.

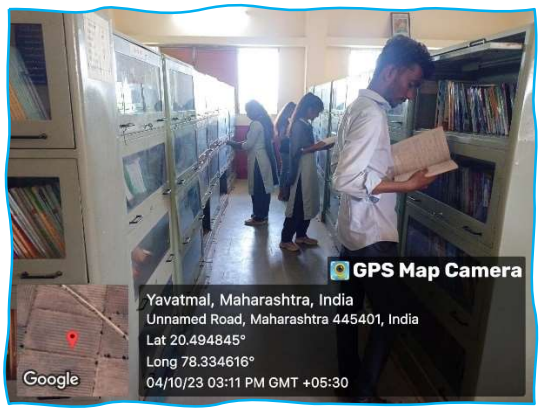
Measurement of Noise in and around Indira Mahavidyalaya

Place	Measurement (Duration in second)	Minimum (dBA)	Maximum (dBA)	Average (dBA)
College Entrance Gate	60	64	85	74
Principal Office	60	45	81	63
College Office	60	58	80	69
Staff Room	60	54	74	64
Computer Lab	60	45	81	63
Near Economics Dept.	60	46	80	63
Near English Dept.	60	60	72	66
Library	60	58	81	69
Gymnasium	60	55	66	60
Near Geography Dept.	60	58	80	69
Near Zoology Dept.	60	50	68	59
Near Chemistry Lab	60	60	70	65
Play Grounds	60	56	74	59
College Canteen	63	72	66	69
Seminar Hall	59	85	63	74
1st Floor	60	64	79	70
2nd Floor	60	45	81	63
Outside the Campus	60	67	89	78

Recommendations:

To reduce noise pollution -

- Plant more trees as sound barriers.
- Use soundproof curtains in office, IQAC room and Principal cabin.
- Limit noisy activities.
- Educate and raise awareness.
- Avoid the use of loud speakers if not necessary.

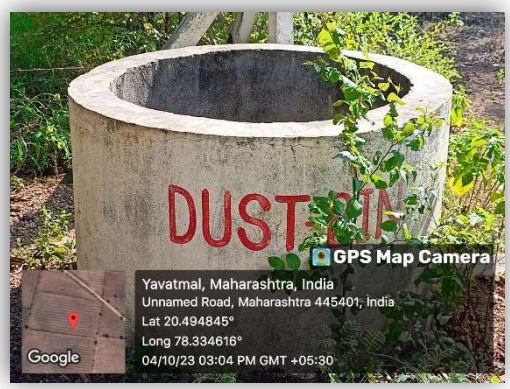


Waste Audit

Waste Generation

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channelled 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 way communities generate and manage their waste plays an absolutely key role in their ability to use resources efficiently. All buildings contain bins for both general waste and mixed recyclables (plastic bottles, card, cans and paper). On average each floor in the buildings areas has its own general waste bin and one recycling bin. When the bins are emptied by the cleaning staff.



Cement constructed and fibre/plastic bins are marked and kept at different places, however in some locations throughout the building it was unclear which bins were for which waste streams. There are four basic ways in which campus can do plastic recycling collection services for plastic bottles and containers – curb side, drop-off, buy-back or deposit/refund programs. The first, and most widely accessible, collection method is curb side collection of recyclables. The campus is installed bins to collect plastic bottles and single use plastics. College staff have given a proper awareness on plastic waste problems and they are discouraging the students teachers to carry plastics to the campus. The Garden Committee is very active in the campus and do a verity of programs to build awareness on waste management. The reports on different activities of the club are attached as technical supplement of this report.

The major concern of waste management will be focused on the solid waste produced by the campus. Solid wastes produced in the campus are mainly of three types, food waste, paper waste, and plastic waste. Food wastes produced in the campus by canteen and by the students and staff after the consumption of meals.

Solid Waste Management

Aims: 1) Scientific disposal of solid waste.
2) Protection of human health and environment.

Objectives: 1) To increase recycling level
2) To reduce organic waste in landfills
3) To control air, water, soil pollution
4) Production of green manure and vermicompost.

Activity:

Solid waste is separated as **dry** and **wet**. Dry waste includes plastic, glass, paper, metals, wood and related product. Wet waste typically refers to organic waste usually generated as canteen waste, plant debries.

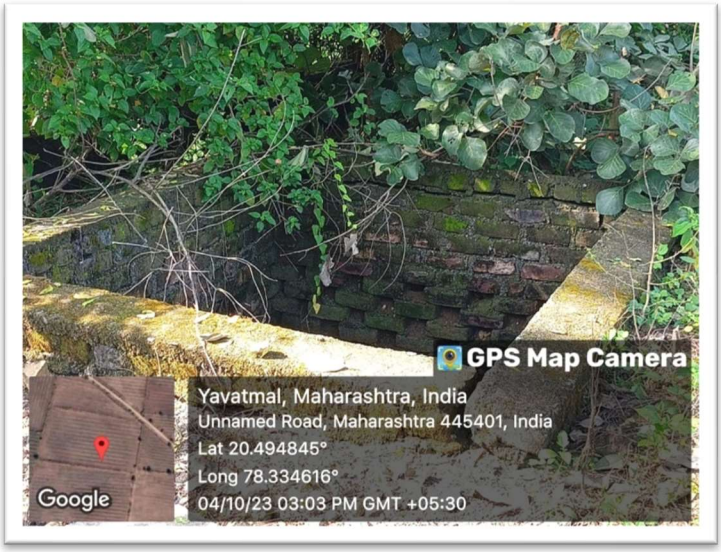
Dry waste is separated and it is given for its resue and recycling to the recycler agency to avoid the pollution.

Wet waste is also known as **organic** waste. It is obtain from canteen, fallen Leaves, litter, ort, trash etc. produce in this campus if it is not disposed properly it creates air pollution, to avoid this we have implemented solid organic waste management activity, we run it at two level **one** is decomposition of solid waste through the composting in pit, vermicompost form solid organic waste and **second** is training to the students, farmers about production of organic manure like vermicompost, production of mushroom from the solid organic agricultural waste which ultimately conversion of Best from Waste, further the best biofertilizer is used for plants of college campus which enhances greenery leads environment clean and fresh.

Vermicompost Unit

The solid waste comes from garden, canteen, office produce a wide range of organic wastes, such as straw, leaves, stalks, weeds, vegetable wastes, processed food and paper. College has constructed chamber for vermicomposting.

College is using the earthworms for vermicomposting. Earthworms are used to manage all these agricultural wastes, earthworms convert this waste into humus or manure or 'Vermicompost' or worm castings, which is a nutrient-rich and biologically beneficial soil product. Vermicompost enhances plant growth, suppresses disease in plants, increases porosity and microbial activity in soil, and improves water retention and aeration. Vermicompost also benefits the environment by reducing the need for chemical fertilizers and decreasing the amount of waste going to landfills. Vermicompost contains 2 times more magnesium, 15 times more nitrogen, and 7 times more potassium compared with the surrounding soil.



Observations:

Burning plastic and other wastes releases dangerous substances such as heavy metals, Persistent Organic Pollutants, and other toxics into the air and ash waste residues. Such pollutants contribute to the development of asthma, cancer, endocrine disruption, and the global burden of disease. So, burning plastics shall be strictly restricted inside the campus.

The total solid waste collected in the campus is approximately 7 Kg/day. Waste generation from tree droppings is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Segregation of chemical waste generated in chemistry and zoology laboratories is also practiced. Single sided used papers reused for writing and printing in all departments. Important and confidential reports/ papers are sent for pulping and recycling after completion of their preservation period. Very less plastic waste (0.19 Kg/day) is generated, but it is neither categorized at point source nor sent for recycling. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. Few glass bottles are reused in the laboratories. The food waste from canteen is used or sent for vermicomposting.
The institute has adopted vermiculture composting in culture pit. The main purpose of this is to reduce disposable waste in the college campus. After complete process of vermicomposting, it is used as manure in the garden.

Recommendations:

- Reduce the absolute amount of waste that it produces from college staff offices.
- Make full use of all recycling facilities provided by Nagar Panchayat and private suppliers, including glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.
- Single sided papers to be used for writing and photocopy.
- Important and confidential papers after their validity to be sent for pulping.
- Try to avoid use of plastic bottles for drinking water.

Sewage Waste Management

Aims: 1) Scientific disposal of Sewage.
2) Provide solution to maintain health and hygiene.

Objectives:

1) Minimization of air and water pollution
2) Reuse of drainage water.
3) To fulfil the requirement of water for gardening.
4) To minimize expenses on water for gardening.

Activity / Observations:

Population includes students, staff, and stakeholders creates waste water daily. A pond constructed near well and connected by rain water pipes, waste water canals or pipes. It minimizes the air and water pollution. This procedure benefited for garden. There is no filtration process for sewage water.

Recommendations:

- If planned, then during water filtration process, ensure that the equipment used are regularly serviced and the wastage of water is not below the industry average.
- Cleaning of underground pipes is to be done regularly.

E-Waste Generation

E-Waste is a term used to cover items of all types of electrical and electronic equipment (EEE). E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. This makes up about 2.5% of all solid waste, but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

Items and their toxic components

Sr. No.	Item	Components
1	Refrigerator, AC	CFC/HC/Rubber
2	PC and laptops	CRT, fluorescent lamp, copper
3	Television	Metal, CRT, plastic, BRF
4	Computer batteries	Cadmium
5	Capacitor and transformer	PBC
6	Printed circuit board	Lead and cadmium
7	Cathod ray tubes	Lead oxide and Cd
8	Switches and flat scree Monitor	Mercury

Observations:

E-waste generated in the campus is very less in quantity. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E-waste and defective item from computer laboratory are being stored properly. The institution has decided to contact approved E-waste management. The college should not forget that if it is not disposed off properly it can result in various problems in form of pollution, which can be air pollution, water pollution etc.

Recommendations:

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

Waste Generation Charts

(Connected to Carbon Foot Print Chart)

Degradable Waste Generation

Session	2020-21	2021-22	2022-23
Total Occupancy	1319	1215	1277
Waste generated in kg /day	6.38	4.30	5.54
Waste generated in kg /Yr	2328.7	1569.5	2022.1

Non-Degradable waste

Solid non-degradable waste generation

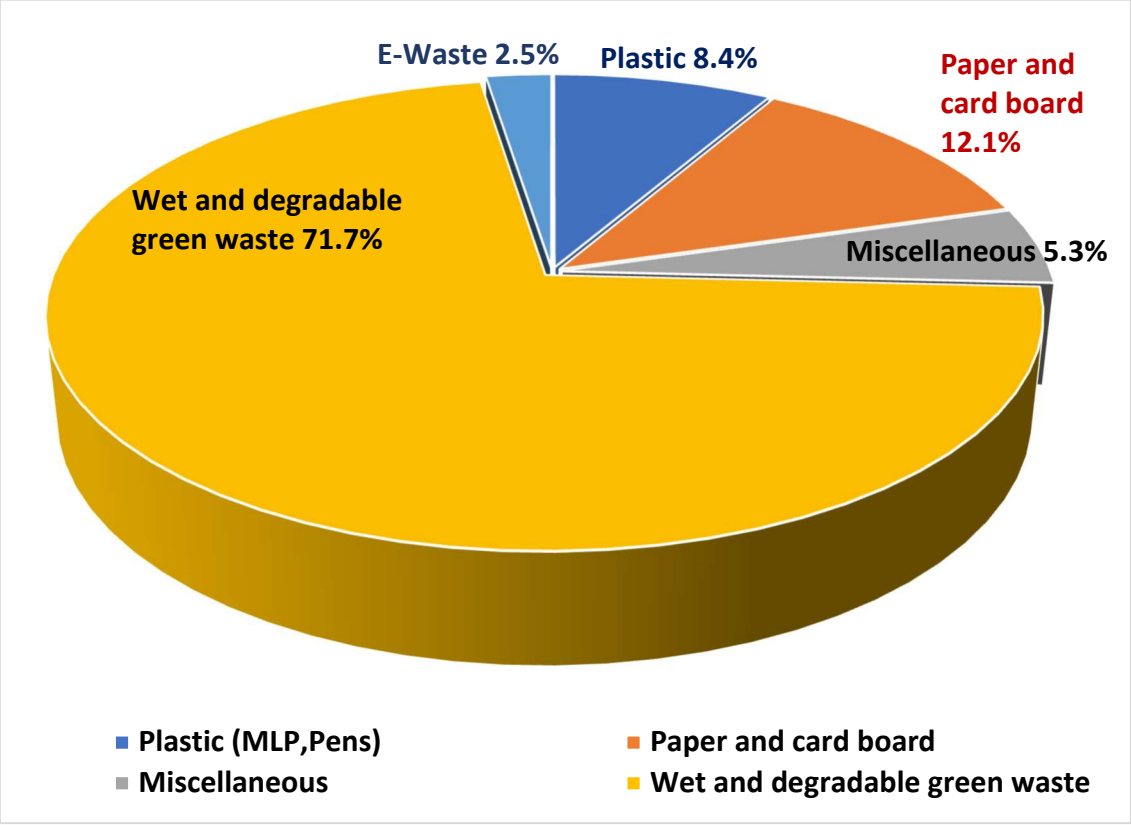
Session	2020-21	2021-22	2022-23
Total Occupancy	1319	1215	1277
Waste paper generated in kg /day (0.25g/p)	0.329	0.303	0.319
Waste plastic generated in kg /day (0.15g/p)	0.197	0.182	0.191
Waste paper generated in kg /Yr (130d)	42.77	39.39	41.47
Waste plastic generated in kg /Yr (130d)	25.61	23.66	24.83
Waste paper generated by office in kg /Yr	20	20	20
Waste plastic generated by office in kg /Yr	10	10	10

Score Card

Sr. No.	CHECKLIST QUESTIONS	OBSERVATIONS	SCORE Max. 100
1	Are there enough number of dustbins provided at various locations? If yes, specify the locations.	Yes. Most of the classroom, laboratories, and premises had a dustbin and each floor had large common bins in which the entire waste of floor was collected.	8
2	Whether the waste is being segregated into different categories or not?	Based on their biological, physical, and chemical properties, wastes are classified into several categories, but there is a need of proper disposal.	7
3	What type of waste was observed throughout the process?	Plastic (MLP, Pens), Paper, Wet Waste, Miscellaneous. Please refer to pie chart below.	8
4	Are there visible signs to encourage recycling, save paper?	Yes. The office and staff have been using the blank sides of already used or printed paper, thus reusing the waste papers. Staff is using soft copy at most level instead of hard copy.	7
5	The methods of disposal of dry waste?	Bottles, cans, plastic, glass, metals, paper and cardboards given to local vendors.	7

6	How do you dispose unwanted electronic equipment, cables, hardwares?	Depending upon the condition they are given to local vendors or in scrap.	5
7	Are there any measures to recycle or dispose wet waste/bio-degradable waste?	Different biodegradable waste is being dumped in a pit, but there is no specific provision for treatment and disposal of wet waste or biodegradable waste.	5
8	What is the provision for compostable organic waste?	There is a pit for decomposing plant and food waste, recycling organic materials, and manure. The resulting mixture is used as plant nutrients.	7
9	What are the recycling efforts taken by institute?	Only decomposing plant and food waste, recycling is there.	3
10	What is the provision to dispose of laboratory waste and culture?	Solid waste is being packaged safely in sturdy bags. Bulk liquids are collected in containers, decontaminated, and then safely discharged into the sewer system. Also, there is a GI pipe connected for this in Chemistry laboratory.	6
		Marks obtained	**63**

Different types of waste and their proportion



Findings of Waste management:

The college campus was generally found to be clean during the audit period. Due to dustbins placed at various sources of waste generation, there was no waste seen inside the building or the premises. Most of the dry waste like paper, cardboard and the electronic waste is stored and handed over to a vendor/scrap dealer which is a good practice. However, the biological waste, that is food waste from the canteen and from the tiffin of staff members is sometimes being disposed off in the constructed cement bins of the college. It eventually gets mixed with other waste and it ultimately results in foul smell and pollutes the environment.

Recommendations:

- Waste must be properly segregated to make sure that the dry and wet waste are not mixed.
- Since wet waste can be subjected to composting (Either Vermicompost or Bio compost), we strongly recommend that the college authorities should make proper monitoring and maintenance of vermi or bio composting unit within the premises.
- This will not only result in the production of good quality compost but also will reduce the hazards of pollution from the community. This can also become a role model for the entire community around the college campus.

Water Audit

Water Use

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 it use.

Drinking Water Analysis

The drinking water facility in a college is one of the basic ones. College has sufficient supply of drinking water to the students and college staff through a modern technology enabled water purifier in the college premise. This machine is also equipped to provide cold drinking water. Purified water is considered to be very effective one in this severely affected area with Arsenic contamination.

Observations:

The study observed that 2 Wells out of 3 are the major sources of water. Water is used for drinking purpose, canteen, toilets, laboratory and gardening. During the survey, no loss of water is observed, neither more leakages, nor by over flow of water from overhead tanks. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 6000 L/day, which include 1500 L/day for domestic purposes, 3000 L/day for gardening and 1500 L/day for different laboratories. Two rain water harvesting units are also functional for storing and reuse.

College made a beautiful pond for collection of rain water and waste water and a canal for collection of water going waste during rainy season from outside of the campus. This is one of the unique steps towards greening practices.

Data collected from all the sources where faucets are fitted indicate that water is being used judiciously by the occupants of the college premises. Hardly any tap was found to be leaking. So, the water wastage is minimal although there are no specific measures adopted by college authorities for water conservation. Overall water consumption pattern is found to be satisfactory.

Recommendations:

- Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale/medium scale/ large scale reuse and recycle of water system is necessary.
- Minimize wastage of water and use of electricity during water filtration process, if used, such as aqua guard filtration process as well as extreme use of water coolers and ensure that the equipment's used for such usage are regularly serviced and the wastage of water is not below the industry average for such equipment's used in similar capacity.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e., are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.

Rain water harvesting

The rain water harvesting is 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 agricultural purpose. The method of rain water harvesting has been into practice since ancient times. It is as far the best possible way to conserve water awaken the society towards the importance of water. The method is simple and cost effective too.

Aims and Objectives:

Aims: 1) Conservation of fresh water.
2) Increase the ground water level.

Objectives:

1) To arrest ground water decline and augment ground water.
2) To conserve surface water runoff during monsoon.
3)To reduce soil erosion.

Activity / Observations:

Rain Water is primary source of fresh water. The rainwater harvesting is through the pipelines connected from roof top to pond. It resulted in to increase of water level. The college has a canal that collects water flowing from outside the campus during the rainy season, which benefits the garden. Rain water is collected every year from roof of the building in cans and after filtration it is used as distilled water for science laboratories.

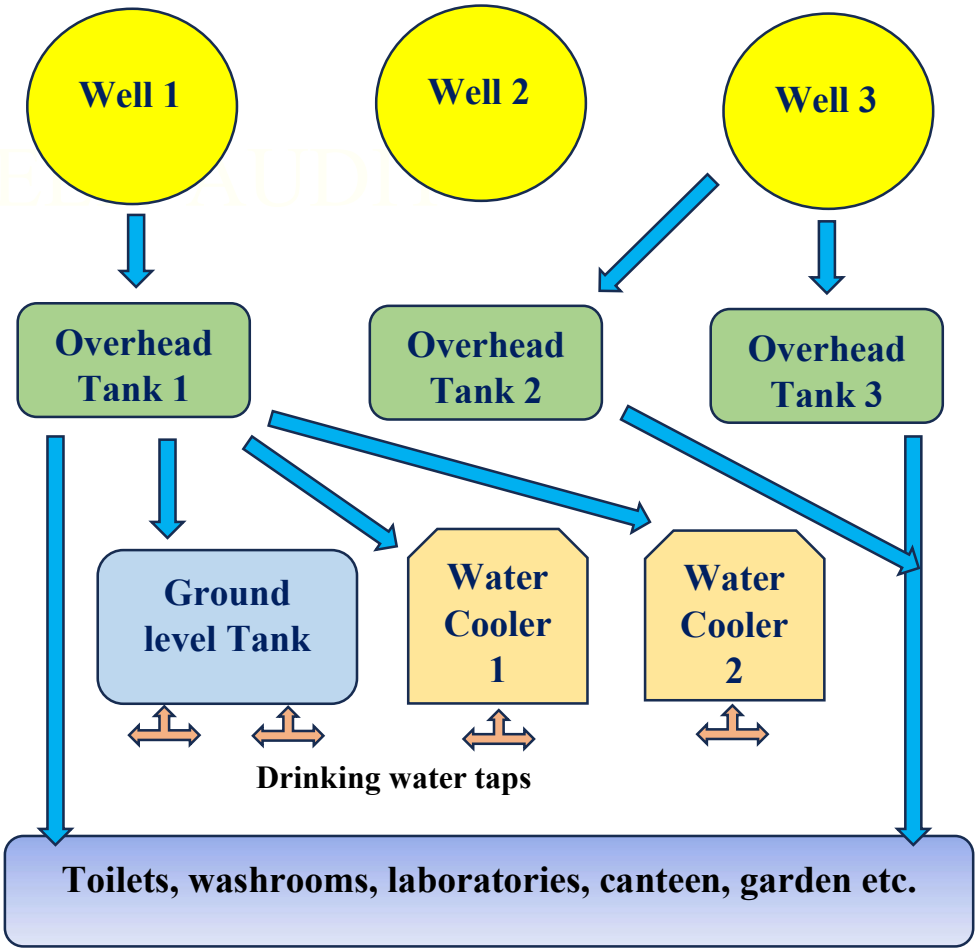
Recommendations:

- Increase the Pits for rain water harvesting.
- Pond or water reservoir is to be cleaned regularly.
- All the pipes of rain water harvesting from roof to reservoir must me properly maintained.

Score Card

Sr. No.	Checklist Questions	Observations	Score Max. 100
1	Sources of water to meet the daily need?	There are 3 wells in campus from which college get hard water. Out of that one well in not in use. The drinking water is taken from overhead tank as well as a drinking water tank through aqua guard filter connected to 2 water coolers.	9
2	How is the water distributed?	The water is taken from two wells by motor to the 3 different overhead tanks and 1 is at ground level. Then it flows through different taps which are in use to toilets, washrooms, laboratories, canteen, garden as well as drinking water tank through water coolers.	8
3	How many tanks are there to store the water? and what is there capacity?	There are 4 tanks to store water. One is at the Ground and the other 3 are at the top. Total Capacity is 15,000 litres.	8
4	How many taps are there in total in survey area?	There is total 67 taps out of which 2 are not working.	7
5	Were there any leakages seen?	Yes. Out of 67 only 4 taps had leakages.	7
6	Were there any water saving devices on sink, toilet taps?	No, but few taps are pushing pattern so water is being saved.	3
7	Are there any sensors fitted on tanks to prevent overflow?	No, but the overflow water comes to rain water harvesting pipes and collected in pond to minimise the waste.	3
8	Are there any provisions for Rainwater harvesting?	Yes. Water is collected in a pond near well through pipes connected from roof of each building. There is a small canal near garden made by college to collect rain water running outside of premises during rainy season.	8
9	What provision is there for drinking water for teaching, non-teaching staff, students and visitors?	Teachers carry their water bottles. Non-teaching staff and students use water coolers fitted with aqua guard and a drinking water tank. Visitors are supplied sealed mineral water bottles or filtered water cans.	7
10	What provision is there for regular supply of water to garden and plants?	There are pipelines connected from overhead tank to garden. Water supplied manually by non-teaching staff to other plants in earthen vessels or Gamla.	8
		Marks obtained	**68**

Flow chart of water supply



Overall Recommendations

Green audit is one of the important tools to check the balance between natural resources and its judicial use. Green auditing is the process of identifying determination of institutional practices eco-friendly / sustainable or not. Indira Mahavidyalaya has conducted a 'Green audit' to check green practices and prepared a well-defined audit report to understand whether this institution is on the way of sustainable development.

After reviewing the above green status of college green audit team suggests the following points:

1. Implement a utility monitoring program.
   - Allocate staff to carry out readings for waste and water on regular basis.
   - Add monitoring data to spreadsheet so results can be viewed graphically.
2. Consider adopting and implementing a sustainable procurement policy which takes into account the whole life cycle of a product, and make sure environmental issues are written into tenders when contracting out.

3. Consider trailing recycled paper again – many recycled brands today, are just as good as virgin paper.
4. Trial the use of re-manufactured (i.e. refilled) ink and toner cartridges rather than purchasing new ones.
5. Consider producing some designated 'environmental' pages on the intranet to make it easier for staff to find environmental information. If possible, a discussion forum could be set up to allow easy internal communications and staff to make suggestions for environmental improvements.
6. Environmental training could be formalized and carried out for all staff. It does not have to be too long or onerous, providing it covers key points, particularly in relation to waste so all staff are aware of the legal requirements. At the very least, environmental information should be included in the induction pack.
7. It is strongly recommended that environmental information is also given to students and staff during induction. It is particularly important for them to be aware of what waste they can dispose on site and where they can dispose of it, and what waste streams they must take away with them.
8. Consider implementing an environmental management system to incorporate all improvements and monitoring requirements. It does not need to be a complex system certified to any particular standard, merely a way of ensuring that baselines are set and progress is measured. Formation of Environment Policy and communicated to all faculties and other staff.
9. Plan for Zero Waste Campus Project.
10. E-waste monthly inventory be maintained at campus.
11. Increase in Environmental promotional activities for spreading awareness at campus.
12. Increase the number of plants/trees in college campus and field area.
13. Install waste management system and college campus should be totally plastic free.
14. Install roof solar panels.

Conclusion

Considering the fact that the institution is predominantly an undergraduate and postgraduate college, there is significant environmental research both by faculty and students. The environmental awareness initiatives are substantial. The paperless work system and vermicomposting practices are noteworthy.
Besides, environmental awareness programmes initiated by the administration shows how the campus is going green. Few recommendations are added to curb the menace of waste management using ecofriendly and scientific techniques. This may lead to the prosperous future in context of Green Campus & thus sustainable environment and community development.
As part of green audit of campus, we carried out the environmental monitoring of campus includes Illumination, Noise level, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus well within the limit i.e. below 65 dB.
This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. The audit has identified several observations for making the campus premise more environmentally friendly. The recommendations are also mentioned with observations for the team to initiate actions.

However, there is scope for further improvement, particularly in relation to waste minimization and energy monitoring. By implementing a basic environmental management system, current good practice can be formalized and a framework can be set up for monitoring, implementation of action plans and continual improvement.

The audit team observed that the overall site is maintained well from environmental perspective. There are no major observations but few things are important to initiate urgently are waste management records of hazardous waste, rainwater harvesting recharge; water balance cycle and periodic inspection of buildings; environment policy and initiation of composting at campus.

We are grateful to trustees of Dr. Yeshwant Moreshwar Donde Sarwajanik Shaikshanik Trust, Kalamb to award this prestigious project and allowed us to enter the new era of Green Audit Green audit in the College Campus. Further we sincerely thank to Principal Dr. Pavan Mandavkar, the staff members and students of Indira Mahavidyalaya for providing us necessary facilities and co-operation during the audit. This helped us in making the audit, a success. Further we hope, this will boost the new generation to take care of Environment and propagate these views for many generations to come.

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Date: 30/10/2023

GREEN ENERGY SOLUTIONS ★ AGENCY CODE-MAH4211 ★

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Ref.: GEA 101-2023 Date: 30/10/2023

Green/Environmental Audit Certification

This is to certify that,

The data collection has been carried out diligently and truthfully;

All reasonable professional skill, care and diligence had been taken in preparing the Green/Environment Audit report & the contents thereof are a true representation of the facts;

Adequate training provided to personnel involved in daily operations after implementation of recommendations.

This Environment Audit included Sectoral Audits, i.e. Water, Energy, Waste cum Material & Resource recovery, Air Quality & Noise, Biodiversity, Infrastructure & outdoor environment, Health & well-being, I.E.C. Activities and Institutional management.

Indira Mahavidyalaya, Kalamb is certified to have done exceptionally well to conserve environment and ensuring sustainable development.

Duration of Audit: August 2023 to October 2023

Assessment Period: 2020-21, 2021-2022, 2022-23

This Certificate is issued to **Indira Mahavidyalaya, Kalamb, Dist. Yavatmal** on their request.

Dated this **30th day of October 2023**.

Director, GES
Prabhakar P. Patil
Director
Green Energy Solutions
Agency Code- MAH 4211