

ENERGY AUDIT

STUDY PERIOD (ONE YEAR) 2021 - 2022

Sustainability study
RENEWAL AUDIT REPORT

Studied for
Bharatiya Shikshan Prasarak Sanstha's
Kholeshwar Mahavidyalaya

Parli Road, Ambajogai
Taluka. Ambajogai Dist. Beed 431517

Studied in the capacity of
An accredited & Certified Green Building Professional



Studied by

Greenvia
Solutions

Valid till **January 2024**

Disclaimer

The Audit Team has prepared this report for the **Bharatiya Shikshan Prasarak Sanstha`s Kholshwar Mahavidyalaya** located at Parli Road, Ambajogai Taluka, Ambajogai Dist. Beed 431517 based on input data submitted by the College analysed by the team to the best of their abilities.

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

These can be implemented phase wise or as a whole depending on the decision taken by the Hon'ble Management and College. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who has completed audits of multiple Institutes including Technical, State University, Private University and Single Faculty Colleges for a total of more than 45 lakhs+ sq. ft. of Built-up area audited till date Pan India as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

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

Greenvio Solutions

Developing Healthy and Sustainable Environments

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

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Acknowledgement

The Audit Assessment Team thanks the **Bharatiya Shikshan Prasarak Sanstha`s Kholeswar Mahavidyalaya, Maharashtra** for assigning this important work of Energy Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Dr. Surendraji Alurkar Sir**, President; **Shri. Nitinji Shete Sir**, Secretary; **Shri. Chandrakantji Mule Sir**, Joint Secretary and everyone from the Management.

Our heartfelt thanks to Chairperson of the entire process **Dr. Mukund Devarshi Sir, Principal** for his valuable inputs.

We are also thankful to **College's Task force the faculty members** who have collected data required **Prof. Rahul Chavan**, Assistant Professor for the inventory and data collection.

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

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

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RENEWAL REPORT

1. Introduction

The College is run by Bhartiya Shikshan Prasarak Sanstha, Ambajogai established on 28 June 1951. The Sanstha has rich tradition of Quality education of 60 years. The college was started by the Sanstha in June 1972 and it has created a good tradition of quality education in the course of 51 years of its existence.

The college offers a number of Undergraduate; Post graduate courses in Arts, Science and Commerce faculties and UGC sponsored Career Oriented Courses. The objectives of the College are documented as follows:

- To make available various courses at UG and PG level for the students.
- To Equip The Students For Global Competency By Providing Them With Knowledge & Necessary Skills.
- To cultivate moral values among the students this for us includes Human rights, Social justice, secularism, democracy etc.
- To develop all-round personality of the students by providing proper facilities and suitable healthy atmosphere.
- To create awareness of modern technology among the students.
- To make available various skill-oriented courses to students so that they will get the job or become self-employed.
- To contribute in social awakening and social change through education.

1.2 Populace analysis for Academic year 2021-22

1.2.1 Students data

The student data (shared by the College) shows there were a total of **385 Boys and 440 Girls** students thus **a total of 825 students** in the premises.

1.2.2 Staff data

The staff data shows the premises had a total of **62** Staff Members.

1.3 Total College Area & College Building Spread Area

The **total site area is 1.7 Acres**, a new building is under construction; the site is designed for a total of 887 footfalls.

1.4 Timeline of activities for Green Building Study Audit

- ➔ Discussion with the College
- ➔ Allotment and Initiation by the College
- ➔ Process discussion with team
- ➔ Data submitted by College
- ➔ Submission of the Report

1.5 MoU's and Collaborations

The College has extended its educational connect by being associated with reputed Colleges. The details of the recent collaborations are documented below.

- ➔ Yashwantrao Chavan College, Ambajogai
- ➔ Arts & Commerce Mahila Mahavidyalaya, Ambajogai
- ➔ Vasundhara Mahavidyalya, Ghatnandur
- ➔ Panditguru Pardikar Mahavidyalya, Sirsala
- ➔ Swami Ramanandteerth Mahavidyalya, Ambajogai.

2. Audit inferences 2021-22

As the College had undergone a renewal for the Academic year 2021-22, a data collection process for verification purposes were asked to be submitted. The report has been prepared based on the inputs provided for immediate action for improvement in this subject.

2.1 Positive points that are implemented as per previous Report

The College is moving towards automation a notice has been displayed about the same.

2.2 Section-wise recommendation related to 'Equipment'

The following points are listed as value addition to the existing premises, are should be considered as **first priority** for implementation under section wise study. These have to be implemented in the next 1 year of the submission of the Report. Owing to the excellent practices adopted at present, the numbers of recommendations are less for this section.

2.2.1 Non-LED lights to LED

Non-LED lights - The current light analysis shows that the University has Non-LED lights in certain areas, these should be replaced with LED lights which consume 16-20W when in use.

Our technical analysis shows that there would be a reduction of an average of **60% reduction** in energy consumption through lights specifically as a part of the electro-mechanical system if all **Non-LED lights** are replaced on all floors and buildings with an energy-efficient appliance whenever the University undergoes renovation.

2.2.2 Ceiling Fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 60W when in use. These should be replaced with energy efficient fans consuming 35W when in use.

Our detailed study states that is all the **ceiling fans on all floors** if replaced with star

rated appliance results in a reduction of average of **42% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if college can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

2.2.3 Desktop computers to laptops

Among all equipment, it suggested replacing the desktop computers with laptops as this would be energy efficient. A normal desktop computer consumes an average of 250W and it is to be connected all time when it has to be used. On the contrary, a laptop consumes 40W and has a battery backup that lasts up to 4 hours. There is **an average 84% reduction** in energy consumption if replaced with an energy-efficient appliance which is a laptop in all the areas. This replacement is however dependent on a variety of factors as follows.

- **Some of the senior staff** members may be more convenient with computers; replacement with a laptop might result in a change of the working patterns and hours which may affect the productivity.
- **Laptops** in case are not handled with care such as if dropped unintentionally might result in data imbalance.
- **Students who are not day scholars** can use a laptop at their convenience; whereas in common areas there can monitor of the usage hours hence computers may be a preferable option then laptops in certain spaces.

Thus the Institute should analyze the above points and then devise a strategy for the replacement, when the devices get damaged or are not in working condition.

2.2.4 Facility management systems, controls (Smart premises)

The College has extreme potential to become 100% energy efficient premises. In addition to provisions in the electromechanical system some facilities can be introduced towards building management systems as well. These can be undertaken equally for educational and residential sections. (Includes electromechanical systems – Electrical, Water)

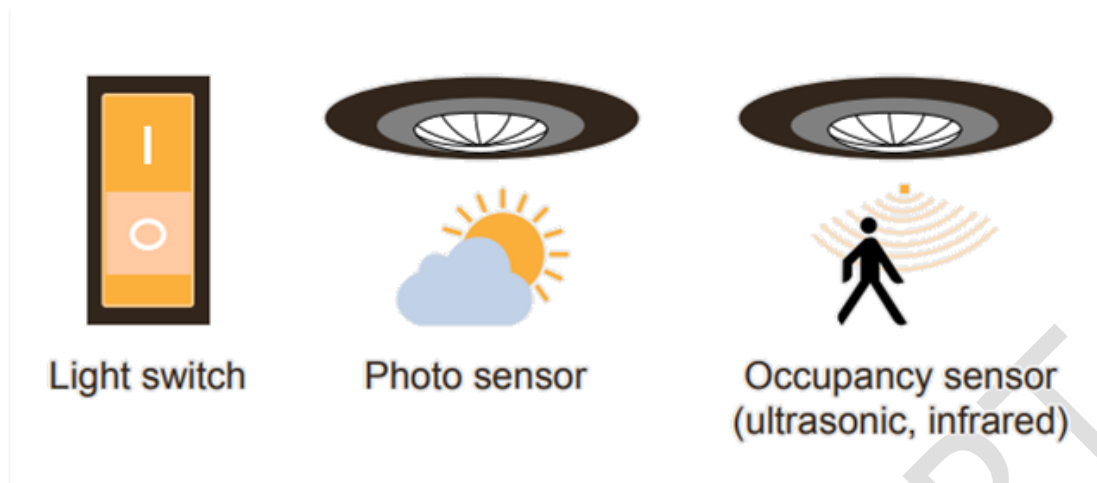


Plate 1: Understanding the lighting concepts

Source: https://seors.unfccc.int/applications/seors/attachments/get_attachment?code=NG125PFE4WHMWSYAK8TCAKIHMWX0F4QD

The above diagram provides a detailed study of how the system controls should be incorporated in the premises as far as lighting systems are considered. The suggesting for this sub-section are listed below.

- ➔ Install PIR control of the lighting in the toilet areas.
- ➔ Install low flow taps with automatic shut off in the toilets.
- ➔ Install push button timer control in all rooms lighting and ceiling fans.
- ➔ Install audible alarms on the laboratory doors to ensure doors remain closed at all times.
- ➔ Install Power Electronics control of the Foyer notice board lighting.
- ➔ Use of photo sensor switch for street light controlling helps in conserving the lighting energy.

2.2.5 Other equipment

The following recommendations are for the other equipment in the premises.

- ➔ Backup computer files during vacations.
- ➔ Refrigerators and all electronic equipments should be cleaned out completely including system check up with AMC during vacations, this should be a periodic activity and the same should be documented every year.

3. Inferences as Consolidated study

These are to be considered as ***second priority*** for implementation, once the section wise recommendations are implemented. The following recommendations should be ***implemented within the next 2.5 years from the date of the Report submission.***

- **Articles and Documentation** – The premises has multiple features which add to the beauty of the nature and improve the environment in the premises, it is thus suggested to have an article written every month as guided by the Team based on the MoU.
- **Scope for executing multiple dense forests (Green zones) in the premises based on the prototype** – This can be executed after the Carbon sequestration study has been completed. The Miyawaki technique can be undertaken for this purpose.
- **Determination of Plastic (orange) zones** – The study and execution can be undertaken through a pilot project where the waste plastic can be collected through areas within 5 km of the premises and a product can be developed.
- **Social welfare** – The College can undertake an activity under the NSS/ NCC to prepare a prototype of Solar panels at a low-cost for the rural areas/ villages that are adopted under rural development programmes.



Environmental awareness campaign by naming the plantations in the premises



Water management practices in the College

4. References

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

Specific references for study related to energy

- ➔ <https://www.energy.gov/eere/buildings/zero-energy-buildings>
- ➔ <https://www.dsaarch.com/zero-net-positive-energy>
- ➔ U.S. Energy Information Administration

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