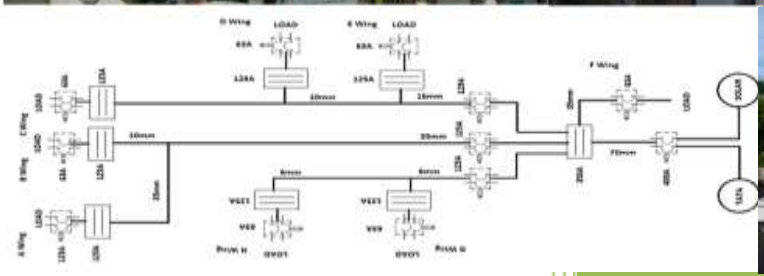
# SAUR ENGINEERS & CONSULTANTS PVT. LTD.

Registered Energy Auditor "CLASS-A" -MEDA, Govt. of Maharashtra, Licensed Electrical Contractor - IE&L Govt. of Maharashtra, Registered Electrical Contractor CLASS-A, ISO 14001:2015, Certified Solar Grid Engineers NISE-MNRE, Govt. of India.

- Liasoning
- Energy Audit
- Safety Audit
- Electrical Projects
- Solar Projects

## Kharepatan Panchakroshi Shikshan Prasarak Mandal's
## Arts, Commerce and Science College, Kharepatan .



Report By

M/s. Saur Engineers & Consultants Pvt. Ltd., Mumbai.

- Registered Energy Auditor
- Power Consultant
- Channel Partner-MNRE, Govt. of India.
- Channel Partner-MEDA, Govt. of Maharashtra.
- Solar Grid Engineers, NISE, Govt. of India
- Licensed Electrical Contractor,

# Detailed Report

## Energy-Green-Environment Audit

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## Project Beneficiary
## 2023-2024

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Kharepatan Panchakroshi Shikshan Prasarak Mandal's
Arts, Commerce and Science College

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Kharepatan, Dist. Sindhudurg, Maharashtra 416703

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## Consultants & Auditor

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**SAUR**
**Engineers & Consultants**
**Pvt. Ltd.**
REGISTRATION NO. : EA-28

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D-8, Plot No. 108, Akshay, Rsc-16,
Gorai-1, Borivali (west), Mumbai-400092
MAHARASHTRA
+919867499812/+919168402909

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# INDEX

## Acknowledgement

Energy, Green and Environment Audits have been successfully completed by M/s. Saur Engineers & Consultants Pvt. Ltd. Empanelled Energy Auditor(CLASS-A) MEDA, Government of Maharashtra and an ISO 14001:2015 company.
This activity is jointly executed by auditor and beneficiary to account Environmental diversities and development opportunity without sacrificing it's purpose. The main object was to assess the existing system for Environment concerns, High quality, professional and sustainable Environment management, Adopt best practices and Standard operating procedures.
Beneficiary premise is a leading educational service utility in semi-urban area. The college is run as per the norms and standards and having awareness and approach towards Environment saving. The management and staff are keen on saving greenery and energy on every opportunity available.
We sincerely acknowledge efforts of Management and staff members for smooth execution of audit process. We sincerely acknowledge the leaders and guides of the activity who helped to design and supported to the execution of the process

| | |
|---|---|
| Shri. Prajyot Shantaram Nalawade - Asst. Prof. | Team Head |
| Prof. (Dr.) Atmaram Deu Kamble | Principal |
| Shri. Prakash Ghatu Shinde - Asst. Prof. | Team Member, Teaching |
| Prof. (Dr.) Vandana Rajesh Shinde - Vhatkar - Asst. Prof. | Team Member, Teaching |
| Shri. Shrikrishna Ganesh Ranade | Team Member, Non-Teaching |
| Shrimati. Aarti Kiran Karle | Team Member, Non-Teaching |
| Kumar. Saurabh Madhukar Pendkalkar | Team Member, Student |
| Kumari. Bhakti Kishor Pise | Team Member, Student |
| Kumar. Harshali Anant Sawant | Team Member, Student |
| Kumar. Pruthvik Dipak Sawant | Team Member, Student |
| Shri. Nitin Sahdev Kondvilkar | Team Member, Electricity |
| Shri. Prakash Karyappa Vhankali | Team Member, Plumbing |
| Shri. Jagannath Dhondu Rasal | Team Member, Gardening |
| Shrimati. Dipali Dilip Patankar | Team Member, Helper |
| Shrimati Swapnali Atmaram Kamble | Team Member, External Expert |

**and all other technical, teaching, non-technical staff and students of college.**

## Certificate

**This is to certify that Energy, Green and Environment Audits have been successfully completed by M/s. Saur Engineers & Consultants Pvt. Ltd. Empanelled Energy Auditor(CLASS-A) MEDA, Government of Maharashtra and suggestions for improvements have been given. The Audit activity has been executed for beneficiary with following Details:-**

**Name of Beneficiary:** Kharepatan Panchakroshi Shikshan Prasarak Mandal's Arts, Commerce and Science College,Kharepatan

**Registration Number:** ICM / I / 558 / 2012 - 13

**Address:** At and Post Kharepatan, Tal. Kankavli, Dist. Sindhudurg, Maharshtra-416703

**Contact Person:** Mr. Sayyed Vaseem Hanif Haseena

**Contact Number:** 02367242211/7972063362

**Date of Audit:** 03/12/2023

**The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.**

EA-28

ENERGY AUDITOR "CLASS-A" No. EA-28
SAUR ENGINEERS & CONSULTANTS PVT. LTD.
Plot No. 108, D-8, Gorai-1, Borivali (W),
Mumbai - 400 091.

**Sign & Seal**

**Saur Engineers & Consultants Pvt. Ltd.**
**Registration No: EA-28**
**Empanelled Energy Auditor-CLASS A,**
**MEDA, Government of Maharashtra**

# 1. Introduction

## 1.1. Energy Audit

Energy Audit is a Basic essential activity to be done for saving in electrical billing and also allied with any energy saving projects like renewable energy project and solar projects. Energy Audit is an assessment of usage, consumption and pattern of energy used in the premises based on all above parameters along with conditions and benchmarks as resource and Building Envelope Analysis, working, operational and Maintenance Procedure Analysis, Utility Data Analysis, Load Data Analysis, Analysis of Energy Consumption, Load Evaluation, consumption pattern and billing history, back-up systems and also the administrative requirements, assessment of safety concerns, assessment of operating and occupancy schedules for Equipment, Power Quality and Environmental Parameters Analysis, Efficiency and Wastage Analysis and assessment of potential risk factors.

Energy Audit is a process of systematic identification, quantification, recording, reporting and analysis of energy usage properties of institute. It aims to analyze within and surrounding the place concerned, which will see interrelation with eco-friendly atmosphere. Energy audit is a valuable means for an Institution related to educational area to determine how and where they are connected with Energy conservation drive of nation. Understanding these conditions the institution can make plans for day to day working, future expansions as well as an eco-friendly view of life while making changes and planning for savings. It provides better understanding of impact of energy consumption on working conditions to staff and visitors. As the Energy availability is becoming an increasingly important issue for the nation, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to Energy availability and quality crisis. On this background it becomes essential to adopt the system of Energy efficient and safe Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. Moreover, it is social responsibility of a High energy consuming institution to ensure that they contribute towards the saving of Energy and thus making it available who are destitute in term of energy availability.

**1.2. Green Audit**

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of natural diversity properties of institute. It aims to analyse within and surrounding the place concerned, in purview of relationship with natural diversity around. Green audit is a valuable means for an Institution related to educational area to determine how and what natural resources or diversity of nature they are surrounded with or they are living with. Green Audit report includes assessment of premises which refers to nature friendly environment with lesser carbon emission in terms of initiatives, implementation, best practices, working environment, capacity utilization based on all above parameters observed during green audit along with conditions and benchmarks as Air Quality, Water Quality, Noise Data, Weather Data, Tree Diversity, Faunal Diversity as well as biodiversity conditions. Understanding these conditions the institution can make plans for day to day working, future expansions as well as a nature-friendly view of life while making changes and planning for savings.

It can create consciousness and awareness about natural diversities around and helps to standardize practices for working with observation of nature friendly work style. It provides better understanding of green diversity available surrounding conditions to staff and students. As the vanishing diversity of nature is becoming an increasingly important issue for the nation as well as the world, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to several greenery and ecological crisis. On this background it becomes essential to adopt the system of Green Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. The National Assessment & Accreditation Council, New Delhi (NAAC) has made it mandatory to all Higher educational institutions should submit a Green Audit Report. Moreover, it is social responsibility of a Higher educational institution to ensure that they contribute towards the saving of Green areas and maintaining good levels of qualities for natural resources available such as Air, water, atmosphere, flora, faunal, Etc.

### 1.3. Environment Audit

Environmental Audit is a process of systematic identification, quantification, recording, reporting and analysis of impact on components of environmental diversity properties of institute. It aims to analyse within and surrounding the place concerned, which will see interrelation with eco-friendly atmosphere. Environmental audit is a valuable means for an Institution related to educational area to determine how and where they are impacting on natural resources or diversity of nature. Environmental audit report includes assessment of premises which refers to impact on environment with carbon emission, wastages in terms of initiatives, implementation, best practices, working environment, capacity utilization based on all above parameters observed during Environmental audit along with conditions and benchmarks as Wastage types, recycling, Greenery, effect of impact, Carbon footprints as well as biodiversity conditions. Understanding these conditions the institution can make plans for day to day working, future expansions as well as an environment-friendly view of life while making changes and planning for savings.

It can create health consciousness, environmental awareness, practice green values and ethics. It provides better understanding of impact on surrounding conditions to staff and students. If self-enquiry is natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the institution evaluates its own contributions towards a sustainable future. As the pollution and $co_2$ is becoming an increasingly important issue for the nation, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to several greenery and ecological crisis. On this background it becomes essential to adopt the system of Green Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. The National Assessment & Accreditation Council, New Delhi (NAAC) has made it mandatory to all Higher educational institutions should submit a Environmental audit Report. Moreover, it is social responsibility of a Higher educational institution to ensure that they contribute towards the saving of environment and reduce level of quantity for impact on natural resources available.

### 1.4. Objective

The Energy audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing Energy availability and quality. The institution has been putting efforts to keep reducing and standardizing energy usage since its inception. Therefore the purpose of present Energy audit is to identification, quantification, recording, reporting and analysis of components of Energy utilization and electrical safety properties of institute framework of energy conservation in compliance with the applicable regulations, policies and standards. The main objectives to carrying out the energy audit are:-

- To have overview of premises
- To record and document Utility data
- To record and document Load profile data
- To record and document basic Electrical Safety observations data
- To record and document Energy Conservations (if any)

The green audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing greenery and natural resources depletion. The institution has been putting efforts to keep clean and green atmosphere since its inception. Therefore the purpose of present green audit is to identification, quantification, recording, reporting and analysis of components of natural diversity properties of institute framework of Green atmosphere sustainability. The main objectives to carrying out the green audit are:-

- To record and document Air quality data
- To record and document Water quality data
- To record and document Weather/Meteorology data
- To record and document Noise Level data
- To record and document Tree Diversity data
- To record and document Faunal diversity data

The Environmental audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing greenery and natural resources depletion. The institution has been putting efforts to keep clean and green atmosphere since its inception. Therefore the purpose of present Environmental audit is to identification, quantification, recording, reporting and analysis of components of surrounding environmental properties of institute framework as a part of global environment sustainability. The main objectives to carrying out the Environmental audit are:-

- To record and document Wastage type and management
- To record and document Recycling Procedures
- To record and document Impact on environment
- To record and document Carbon footprints

### 1.5. Methodology

The purpose of Energy Audit of is to ensure that the practices followed in the campus are in accordance with the Energy Conservation Policy of the Country. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

The report is based on the documents obtained while on site, visual inspection and data collection carried out during the assessment period. All the measurements recorded on site are indicative loads and duties. All readings are collected for analysis and improvement planning. Cost estimates are indicative only as more detailed design and acceptance of suggestions will be required to improve the accuracy of these estimates.

The units are selected from SI (international standards) with meters, Celsius degrees, Etc.

### 1.6. Audit Statement

The building is adopting the "Energy Efficient Campus" system for Energy conservation and sustainability. There are main three pillars i.e. Energy saving by technology and Operation & Maintenance procedures, safe working on occupational health and performance and 100% inmates demonstrating energy efficiency literacy. The goal is to maintain safe working environment, reduce energy consumption, while creating an atmosphere where inmates can work and live healthy.

# 2. OVERVIEW

## 2.1. LOCATION

| Sr. No. | Head | Details | Remark |
|---|---|---|---|
| 1. | **Name of Institute** | Kharepatan Panchakroshi Shikshan Prasarak Mandal's Arts, Commerce and Science College, Kharepatan | |
| 2. | **Category** | Co-ed College | Educational Institute |
| 3. | **Address** | At and Post Kharepatan, Tal. Kankavli, Dist. Sindhudurg 416703 | |
| 4. | **State** | Maharshtra | |
| 5. | **Nearest Railway Station** | Rajapur | Outstation |
| | | Vaibhavwadi | Outstation |
| | | -- | Local |
| 6. | **Nearest Bus Station** | Kharepatan Sub-station | Interstate |
| | | Talere Sub-station | Interstate |
| 7. | **Nearest Airport** | Chipi Airport (Sindhudurg Airport) | |
| 8. | **Longitude** | 16.550 | |
| 9. | **Latitude** | 73.617 | |

## 2.2. Synopsis

| Sr. No. | Head | Details |
|---|---|---|
| 1. | **Name of Applicant Institution** | Arts, Commerce and Science College, Kharepatan |
| 2. | **Address** | At and Post Kharepatan, Tal. Kankavli,<br>Dist. Sindhudurg |
| 3. | **Contact No.** | 02367242211 |
| 4. | **Registration Certificate No.** | Affiliated to Mumbai University No. ICM / I / 558 / 2012 - 13 |
| 5. | **Sector Type** | Rural |
| 6. | **Senior Management Contact** | Prof. (Dr.) Atmaram Deu Kamble |
| 7. | **Contact No.** | 9421149914 |
| 8. | **Status of Institution (Pvt / Public)** | Private |
| 9. | **Company Turnover (Rs. In Lakhs)** | 10 to 25 Lakhs |
| 10. | **Number of Employees** | 26 |
| 11. | **Approximate Floor Area (ft2)** | Main Building - 2200 Sqft<br>Second Building - 1100 Sqft<br>New Building - 6536 Sqft |
| 12. | **Year of Establishment** | 2012 - 2013 |
| 13. | **Plot Area (ft2)** | 07 Acre |
| 14. | **Construction Area (ft2)** | Main Building - 2200 Sqft<br>Second Building - 1100 Sqft<br>New Building - 6536 Sqft |
| 15. | **Greenery Area (ft2)** | 1½ Acre |
| 16. | **Roof Area (ft2)** | Main Building - 500 Sqft<br>Second Building - 300 Sqft |
| 17. | **No. Of Building** | 03 |
| 18. | **Building Type** | Masonry, Roof and RCC Work |
| 19. | **Age of Building** | Main Building - 74 Years Old (Masonry and Roof Work)<br>Second Building - 25 Years Old ((Masonry and RCC Work)<br>New Building - 02 Years Old ((Masonry and RCC Work) |
| 20. | **Leakages / Cracks on Wall / Roof** | No. |
| 21. | **No. of Workers (Footfall)** | 11 (Teaching and Non-teaching Faculties) |
| 22. | **No. of Customers (Footfall)** | 94 (Students) |
| 23. | **Day Vs Night activity in %** | 100% |
| 24. | **Shifts Per Day** | 01 |
| 25. | **Hours Per Shift** | 06 – 08 |
| 26. | **DG Set Installed** | NA |
| 27. | **Inverter Installed** | NA |
| 28. | **Renewable Energy System Installed** | Na |
| 29. | **(Solar / Wind / Biomass / Biofuel / etc.)** | 02 |

## 2.3. Layouts

**Sitemap**

- **Attached in annexure-I**

**Floor Map**

- **Attached in annexure-I**

**Google Map**

- **Attached in annexure-I**

## 2.4. About Premises

Arts, Commerce and Science College, Kharepatan, was established in the academic year 2012-2013 by Kharepatan Panchakroshi Shikshan Prasarak Mandal, a reputable educational institution founded in 1953. The primary aim of establishing this college was to provide higher education opportunities to all classes of society, particularly benefiting the local communities of Kharepatan and surrounding areas.

Since its inception, the college has committed to fulfilling its foundational mission of making higher education accessible to a diverse population. Initially, the college offered programs in Arts and Commerce. Responding to the community's needs, the Science stream was added in 2019. This expansion was driven by the requests and demands of the local villagers and prominent community members. Today, the college offers degree programs in thirteen subjects across Arts, Commerce, and Science streams.

The college is strategically located in Kharepatan, occupying a sprawling area of 7 acres. Of this, 1 acre is dedicated to constructed facilities, while 2 acres are maintained as greenery, including an Aamrai. The college has implemented an annual plantation program, increasing green cover by 10-15% each year. The campus infrastructure includes three main buildings and three washrooms/restrooms, ensuring adequate facilities for students and staff.

Various social, cultural, and economic activities are organized by different cells and committees within the college. These activities are designed to provide students with a holistic educational experience. The college's commitment to excellence is reflected in the 24 awards it has received from the University of Mumbai and various NGOs. These awards recognize the college's contributions in social, economic, cultural, and other fields, celebrating the achievements of both faculty and students.

The college was established as a parent institution to serve the educational needs of the Kharepatan Panchkroshi region, particularly targeting the children of farmers, workers, and fishermen from Kankavali, Devgad, Vaibhavwadi, and Rajapur tehsils. At the time of its establishment, it was the only institution offering higher education to these communities, thereby playing a crucial role in their educational development.

Over the past eleven years, the college has made significant strides in advancing the education and careers of its students. The efforts of the governing and local bodies, including the College Development Committee (CDC), have been instrumental in this progress. The CDC, under the leadership of its Chairman, has worked tirelessly to secure numerous awards and accolades, elevating the college's standing within the University of Mumbai. The quality of education provided has enabled students to excel in various fields, including academics, social work, politics, culture, and sports.

To facilitate curricular, co-curricular, and extra-curricular activities, the college has developed extensive infrastructure. This includes a canteen, parking facilities, a sports gymkhana, playground, and other essential amenities. The integration of IT in teaching, learning, and evaluation has further enhanced the educational experience for both faculty and students.

Student support and progression to higher education are priorities for the college. It offers various welfare schemes for staff and students, including the Earn and Learn Scheme, Yuva Raksha Vima Yojana (Group Insurance), Mentor-Mentee Scheme, and Book Bank Scheme. Other support mechanisms include the Spandan College Magazine, Yuva-jallosh Cultural Programme, academic and career counselling, theme-based wallpapers, and guidance on government and non-government scholarships. The college also facilitates the payment of admission fees in instalments and provides special incentives to NSS volunteers and sportspersons.

The college's well-defined organizational structure promotes decentralized governance, leadership, and management. This structure involves all stakeholders in the general administration and functioning of the institution. Staff and students are elected to represent various academic and administrative bodies, ensuring that institutional goals are achieved collaboratively.

In addition to its strong governance framework, the college has established an Internal Quality Assurance Cell (IQAC) in 2018, following NAAC guidelines. The IQAC is dedicated to continuous improvement and is striving to achieve the best grade of accreditation from NAAC in the academic year 2023-2024.

An eco-friendly campus is one of the outstanding features of the college. The lush green environment and academic ambience across the 1-acre campus create a conducive learning atmosphere. The college is committed to conserving natural resources and protecting the environment through various initiatives such as water conservation, tree plantation, and maintaining carbon neutrality. Regular green and energy audits are conducted by competent authorities to ensure sustainable practices.

Efforts to maintain a healthy and environmentally friendly campus include providing pure drinking water, waste management, and promoting carbon neutrality through initiatives like "No Vehicle Day." These practices not only enhance the campus environment but also instill a sense of environmental responsibility among students and staff.

The college's proactive approach and dedication have been recognized with numerous prestigious awards from the State Government of Maharashtra, University of Mumbai, the Sanstha, and various NGOs. These accolades honor the college's significant contributions to higher education, active research, social service, and extension activities.

Arts, Commerce and Science College, Kharepatan, stands as a testament to the power of education in transforming communities. Its commitment to providing quality education, fostering holistic development, and maintaining sustainable practices has made it a beacon of higher learning in the region. The college continues to strive for excellence, making a lasting impact on the lives of its students and the community it serves.

Arts, Commerce and Science College, Kharepatan, offers a wide range of state-of-the-art facilities to support both academic and extracurricular activities. These include classrooms, a library, reading room laboratories, computer lab and seminar halls etc, all designed to enhance the educational experience and foster student development.

**Our Vision…**

The strengthening education, economically and socially with special focus on education & skills development, to help and motivate every member of the society to lead a dignified personal and social life. While acquiring knowledge, the institute made the students and the community aware that continuous efforts are a good thing to achieve.

**Our Mission…**

Our mission is to offer high quality education dedicated to building minds with social and moral responsibility.

**2.5 Documentation:**

| ITEM | YES/NO |
|---|---|
| **a. Existing Statutory Layouts** | |
| i. Plot Map / Sketch | YES |
| ii. Building / Floor Map (For Each Floor) | YES |
| iii. Roof Terrace Map | YES |
| iv. Electrical SLD | NO |
| v. Details Electrical Control Panels | NO |
| vi. Details of Transformer installed if any | NO |
| vii. Details of Generator (DG-Set) installed if any | NO |
| viii. Details of UPS installed if any | NO |
| ix. Details of Renewable systems installed if any | NO |
| x. Utility Bills (Electricity, Gas, Water, Diesel, Etc.) for 12 months | NO |
| xi. Registers of Records | NO |
| xii. Time Tables | YES |
| xiii. Nameplate Data | NO |
| xiv. Manuals | NO |
| b. Existing safety measures (Fire extinguishers, Safety training and posters) | YES |
| c. Verification of circulars, Records of Preventive measurements | NO |
| d. Verification of Behavioural SOP | NO |
| e. Verification of O & M SOP | NO |
| f. Checking Provision for electric shock response and treatment | NO |
| g. Checking Log of Electrical works/accidents | NO |
| h. Checking Provision of Danger Sign Boards | YES |
| i. Checking Workmen involved in electric work | NO |
| j. Checking Provision and Height of work | YES |

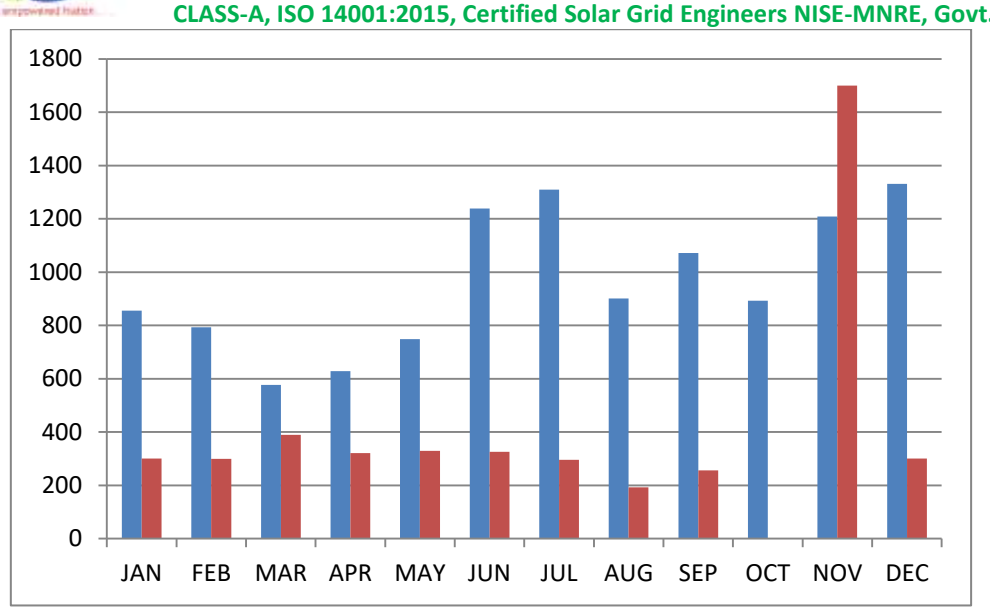
| | |
|---|---|
| k. Checking availability of First Aid | YES |

# 3. Energy Audit

## 3.1. Electricity and Fuel Consumption Analysis

| SL No. | Particulars | Unit | VALUES | VALUES |
|---|---|---|---|---|
| 1 | Supply Type | LT/HT | LT | LT |
| 2 | Utility Company | DISCOM | MSEDCL | MSEDCL |
| 3 | Consumer Number | NO | 230132000013 | 230130007339 |
| 4 | Meter Number | NO | 09005274864 | 053-93313663 |
| 5 | Feeder | SOURCE | NA | 11KV |
| 6 | Tariff | TYPE | 17/LT PUB SERV | 17/LT PUB SERV |
| 7 | Sanctioned Load | KW | 0.7 | 10 |
| 8 | Connected Load | KW | 0 | 10 |
| 9 | Contract Demand | KVA | 0 | 8 |
| 10 | RMD (Year) | KVA | 0 | 0 |

| Month | Consumption | Expenses | Consumption | Expenses |
|---|---|---|---|---|
| (NAME) | (KVAH) | (Rs) | (KVAH) | (Rs) |
| Jan-23 | 855 | 4899.15 | 300 | 1854 |
| Feb-23 | 793 | 4543.89 | 299 | 1818 |
| Mar-23 | 577 | 3306.21 | 390 | 2408 |
| Apr-23 | 628 | 3598.44 | 321 | 2033 |
| May-23 | 749 | 4291.77 | 329 | 2098 |
| Jun-23 | 1239 | 7099.47 | 326 | 2072 |
| Jul-23 | 1309 | 7500.57 | 296 | 1827 |
| Aug-23 | 901 | 5162.73 | 193 | 1196 |
| Sep-23 | 1072 | 6142.56 | 256 | 1581 |
| Oct-23 | 893 | 5116.89 | 0 | 0 |
| Nov-23 | 1208 | 6921.84 | 1700 | 9769 |
| Dec-22 | 1331 | 7626.63 | 300 | 1823 |




| Other Energy Sources | | | | | |
|---|---|---|---|---|---|
| **SL No** | **Energy/Fuel** | **Applicable** | **Unit** | **Use per Annum** | **Cost Per Annum (Rs)** |
| 1 | Coal | | NA | | |
| 3 | Lignite | | NA | | |
| 4 | Fuel wood & Biomass | | NA | | |
| 5 | High Speed Diesel | | NA | | |
| 6 | Light Diesel | | NA | | |
| 7 | LSHS | | NA | | |
| 8 | LPG | | NA | | |
| 9 | Natural Gas | • PNG<br>• LNG<br>• CNG | NA | | |
| 10 | Renewable Power | | NA | | |
| 11 | Captive (DG Set) | | NA | | |

### 3.2. Consumption pattern

| HEAD | Usage (Kwh) | Payment (Rs) | Duration |
|---|---|---|---|
| **Total** | 16265 | 94689.15 | Annual |
| **Min** | 893 | 5116.89 | OCT |
| **Max** | 2908 | 16690.84 | NOV |
| **Average** | 1355.4 | 7890.8 | Annual |

**Note:** Bills are not preserved by college; assessment is done on the basis of provided Data.

### 3.3. Future Expenses Projection on Electricity Bills for Next 20 Years

It is observed past 15 years that electricity rates are increasing with an average growth of 5% per annum. Following table will show how much amount we are going to spend on electricity next twenty years with this growth rate and same consumption.

| SL No | Year | Unit Rate | Expenses |
|---|---|---|---|
| 1 | 2023-2024 | 5.81 | 153381.65 |
| 2 | 2024-2025 | 6.10 | 158106.633 |
| 3 | 2025-2026 | 6.41 | 163067.864 |
| 4 | 2026-2027 | 6.73 | 168277.157 |
| 5 | 2027-2028 | 7.06 | 173746.915 |
| 6 | 2028-2029 | 7.42 | 179490.161 |
| 7 | 2029-2030 | 7.79 | 185520.569 |
| 8 | 2030-2031 | 8.18 | 191852.497 |
| 9 | 2031-2032 | 8.58 | 198501.022 |
| 10 | 2032-2033 | 9.01 | 205481.973 |
| 11 | 2033-2034 | 9.46 | 212811.972 |
| 12 | 2034-2035 | 9.94 | 220508.471 |
| 13 | 2035-2036 | 10.43 | 228589.794 |
| 14 | 2036-2037 | 10.96 | 237075.184 |
| 15 | 2037-2038 | 11.50 | 245984.843 |
| 16 | 2038-2039 | 12.08 | 255339.985 |
| 17 | 2039-2040 | 12.68 | 265162.885 |
| 18 | 2040-2041 | 13.32 | 275476.929 |
| 19 | 2041-2042 | 13.98 | 286306.675 |
| 20 | 2042-2043 | 14.68 | 297677.909 |

You are going to spend **Rs. 40,00,000/- (Rs. Forty Lakhs Only)** on electricity bills in coming 20 years; if we keep current consumption as it is.

### 3.4. Load Profile

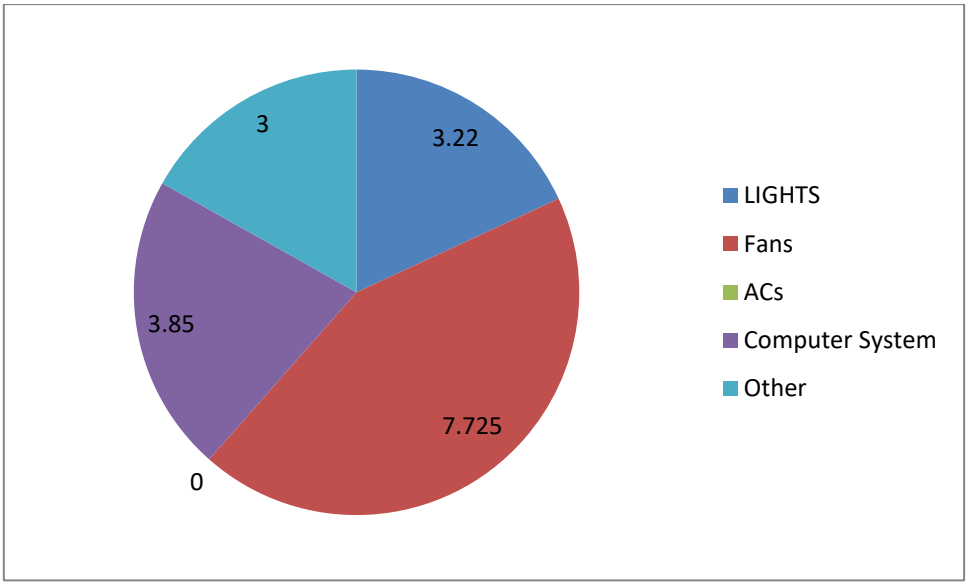
| Sr. No. | Room | Normal Tubes | LED Tubes | Fans | AC's | PC's | Printer | Other |
|---|---|---|---|---|---|---|---|---|
| | ***MAIN BUILDING – GROUND FLOOR*** | | | | | | | |
| 1 | Reading Room | | 2 | 2 | | | | |
| 2 | Library | | 3 | 2 | | | | |
| 3 | Classroom 1 | | 4 | 2 | | | | |
| 4 | Classroom 2 – ICT | | 4 | 2 | | | | |
| 5 | Classroom 3 – ICT | | 4 | 2 | | | | |
| 6 | Principal Office | | 3 | 3 | | | | |
| 7 | IQAC | | 2 | 3 | | | 1 | |
| 8 | Management Office | | 4 | 2 | | | | |
| 9 | Office of Alumni Liaison | | 1 | 2 | | | | |
| 10 | Waiting Room | | 1 | 1 | | | | |
| 11 | Health Center | | 1 | 1 | | | | |
| 12 | Office | | 7 | 3 | | 3 | 6 | |
| 13 | Classroom 4 | | 5 | 2 | | | | |
| | Computer Lab | | 2 | 2 | | 20 | | |
| 14 | Classroom 5 | | 4 | 2 | | | | |
| 16 | Gymkhana | 1 | 1 | 2 | | | | |
| 17 | Store Room 1 | | 4 | 2 | | | | |
| 18 | Staff Room 1 | | | | | | | |
| | ***MAIN BUILDING – FIRST FLOOR*** | | | | | | | |
| 19 | Multi Purpose Hall | 2 | 12 | 10 | | | | |
| 20 | Room | | 2 | | | | | |
| 21 | Room | | 2 | | | | | |
| 22 | Room | | 2 | | | | | |
| | ***SECOND BUILDING – GROUND FLOORN*** | | | | | | | |
| 23 | Laboratory – Chemistry | 1 | | 2 | | | | |
| 24 | Laboratory – Physics | | | 2 | | | | |
| 25 | Laboratory – Botany and Zoology | | 3 | 2 | | | | |
| 15 | Classroom 6 | | 1 | 1 | | | | |
| 26 | Classroom 7 | 2 | 2 | 2 | | | | |
| 27 | Classroom 8 | | 2 | 2 | | | | |
| 28 | Classroom 9 | | 3 | 3 | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ***SECOND BUILDING – FIRST FLOOR*** | | | | | | | |
| 30 | Store Room 2 | 2 | 1 | 3 | | | | |
| 29 | Classroom 10 | | 2 | 2 | | | | |
| 31 | Classroom 11 | | 2 | 2 | | | | |
| 32 | Classroom 12 | | 3 | 3 | | | | |
| 33 | Classroom 13 | 2 | | 3 | | | | |
| 34 | Classroom 14 | 2 | | 5 | | | | |
| 36 | Gents Wash Room 1 | | 1 | | | | | |
| 37 | Ladies Wash Room 1 | | 1 | | | | | |
| 38 | Classroom 15 | 2 | | 2 | | | | |
| 39 | Ladies Room | 1 | | 2 | | | | |
| | ***SECOND BUILDING – FIRST FLOOR*** | | | | | | | |
| 40 | Store Room 3 | | | | | | | |
| | Classroom 16 | | | | | | | |
| 41 | Classroom 17 | | | | | | | |
| 42 | Classroom 18 | | | | | | | |
| 43 | Classroom 19 | | | | | | | |
| 44 | Classroom 20 | | 2 | | | | | |
| 45 | NSS Room | | 1 | | | | | |
| 46 | NSS Store Room | | 1 | | | | | |
| 47 | Classroom 22 | | | | | | | |
| 50 | Classroom 23 | | | | | | | |
| | ***NEW BUILDING – GROUND FLOOR*** | | | | | | | |
| | Loby / Open Space | | 2 | | | | | |
| 51 | Classroom 24 | | 4 | 4 | | | | |
| 52 | Classroom 25 | | 4 | 4 | | | | |
| 53 | Commerce Department | | 2 | 2 | | | | |
| | CAP | | 2 | 2 | | 5 | | |
| 54 | Classroom 26 | | 4 | 4 | | | | |
| 56 | Classroom 27 | | 4 | 4 | | | | |
| 57 | Canteen | | 2 | 2 | | | | |
| 58 | Gents Washroom 2 | | 2 | | | | | |
| 59 | Gents Washroom 3 | | 2 | | | | | |
| 60 | Ladies Washroom 2 | | 4 | | | | | |
| 61 | Room | | 2 | | | | | |
| 62 | Room | | 2 | | | | | |
| | **TOTAL** | **15** | **131** | **103** | | **28** | **7** | |

| OTHER LOADS | NOS |
|---|---|
| CCTV | 4 |
| LED Bulb in Loby | 2 |
| LED Bulb (Entrance) | 1 |
| Normal Bulb in Loby | 2 |
| LED TV | 2 |
| Wifi / Internet Router | 1 |
| LED Lamp (Waiting Room) | 1 |
| LED Lamp (Rest Room) | 1 |
| LED Lamp (Staff Room) | 16 |
| LED Lamp (Monoment) | 1 |
| Single Phase Water Pump | 1 |
| LED Bulb in Loby | 2 |
| AHUJA SSA 250M Amplifier (250 WATTS) | 2 |
| AHUJA Speaker | 2 |
| Mikes | 6 |
| Laptop | 8 |
| Scanner | 4 |
| Projector | 2 |
| Xerox Machine | 1 |
| LED Bulb in Chemistry Lab. | 3 |
| LED Bulb in Physics` Lab. | 3 |

| LOAD PROFILE (KW) | | | | | | |
|---|---|---|---|---|---|---|
| LOAD | LIGHTS | Fans | ACs | Computer System | Other | TOTAL |
| VALUES | 3.22 | 7.725 | 0 | 3.85 | 3 | 17.80 |

| Connected Load | Operated Load |
|---|---|
| Kw | KW |
| 10.70 | 17.80 |




## 3.5. Losses

### 3.5.1. Demand

| | |
|---|---|
| Peak Load | 10.78Kw |
| Diversity Factor | 55% |
| Peak Diverse Load | 09.79Kw |
| Average Working Per day | 06 Hrs |
| Average Daily Consumption | 58.72kwh |
| Measured Consumption as per bill considering 240 working Days | 67.77Kwh |

Average Loss 10-15% can be observed using Energy monitoring system

### 3.5.2. Conservation

1. Replacing regular Fans with BLDC Fans. 3.61Kw and 22Kwh per day saving can be possible.
2. Replacing regular Tubes with LED Tubes. 0.3Kw and 1.8Kwh per day saving can be possible.

## 4. GREEN AUDIT

### 4.1. Floral Diversity

| Year | No. of Trees |
|---|---|
| BEFORE 2022-2023 | 51 |
| 2022-2023 | 18 |
| Total | 69 |

| Sr. No. | Botanical Name | Common Name | Qty |
|---|---|---|---|
| 1. | Mango | Mangifera indica | 32 |
| 2. | Cashew | Anacardium occidentale | 31 |
| 3. | Coconut | Cocos nucifera | 06 |

**SUMMARY**

| Sr. No. | Area | Total Trees |
|---|---|---|
| Total | | 69 |

### 4.2. Faunal Diversity

| Sr. No. | Scientific Name | Common Name | Family | Category |
|---|---|---|---|---|
| 1. | Lepidoptera | Butterfly | Insect | Inasect |
| 2. | Bucerotidae | Hornbill | Bucerotidae | Bird |
| 3. | Anura | Frogs | Ranidae | Ranidae |
| 4. | Halcyon smyrnensis | Kingfisher | Alcedinidae | Bird |
| 5. | Picidae | Woodpecker | Picidae | Bird |
| 6. | Corvus splendens | Crow | Corvidae | Bird |
| 7. | Ardea | Heron | Ardeidae | Bird |
| 8. | Lacertilia | Lizard | Agamidae | Reptile |
| 9. | Scorpiones | Scorpion | Arachnid | Animalia |
| 10. | Pavo cristatus | Indian Peafowl | Phasianidae | Bird |
| 11. | Apis mellifera | Honeybee | Apidae | Insect |
| 12. | Pycnonotus cafer | Red- vented Bulbul | Pycnonotidae | Bird |
| 13. | Paradoxurus hermaphroditus | Asian Palm Civet | viverridae | Bird |
| 14. | Pteropus giganteus | Indian Flying Fox | Pteropodidae | Reptile |
| 15. | Naja naja | Indian Cobra | Elapidae | Insect |
| 16. | Varanus bengalensis | Ghorpad/Bengal Monitor | Varanidae | Reptiles |
| 17. | Libellula depressa | Dragonfly | Libellulidae | Insect |
| 18. | Coccinella septempunctata | Ladybird beetle | Insect | Insect |
| 19. | Coccinellidae | Ground beetle | Insect | Insect |
| 20. | Longhorn beetle | Cerambycidae | Cerambycidae | Insect |
| 21. | Click beetle | Elateridae | Elateridae | Reptile |
| 22. | Scarab beetle | Scarabaeidae | Scarabaeidae | Bird |
| 23. | Russell's Viper | Daboia russelii | Viperidae | Bird |
| 24. | House Sparrow | Passer domesticus | Passeridae | Bird |
| 25. | Common Myna | Acridotheres tristis | Sturnidae | Bird |
| 26. | Indian Robin | Copsychus fulicatus | Muscicapidae | Bird |
| 27. | White-throated Kingfisher | Halcyon smyrnensis | Alcedinidae | Bird |
| 28. | Spotted Dove | Spilopelia chinensis | Columbidae | Bird |
| 29. | Common Tailorbird | Orthotomus sutorius | Cisticolidae | Bird |
| 30. | Black Drongo | Dicrurus macrocercus | Dicruridae | Bird |
| 31. | Rock Pigeon | Columba livia | Columbidae | Bird |

### 4.3. Green Approach

| Sr. No. | ACTIVITY | YES/NO | REMARK |
|---|---|---|---|
| 1. | E-waste collection box: | YES | Institute has separate E-waste Management system. E-waste is collected in separate designated box which is planned to dispose through qualified designated agency. |
| 2. | Dry-waste collection box: | YES | Institute has separate Dry waste Management system. Dry waste is collected in separate designated box which is disposed through loacal body waste management system. |
| 3. | Wet-waste collection box: | NO | Wet waste is directly put in composting. |
| 4. | Paper-waste collection box: | YES | Institute has separate paper waste Management system. Paper waste is collected in separate designated box which is planned to dispose through qualified designated agency. |
| 5. | Cleaning: | YES | Institute runs good cleaning practice. |
| 6. | Composting: | YES | Institute composts partial of their wet waste. |
| 7. | Safe and waste free environment drive: | YES | Institute runs Safe and waste free environment drive within as well as outside campus. |
| 8. | Sewage treatment | NO | |
| 9. | Waste management | NO | |
| 10. | Swachh Bharat campaign | YES | Institute runs Swachh Bharat campaign actively. |
| 11. | Water resources | YES | Institute have sufficient water resources from owned Well and local body supply. |
| 12. | Rain water harvesting: | YES | Institute have implemented Rain water harvesting |
| 13. | Waste water treatment: | NO | |
| 14. | RO water treatment | YES | Institute uses RO plants to purify drinking water |
| 15. | Greenery: | YES | Institute has maintained Greenery within campus |
| 16. | Plantation: (trees and plants in campus) | YES | Institute do Plantation in campus during monsoon. |
| 17. | Plantation drive by the institute: (trees and plants outside campus) | YES | Institute do Plantation outside campus during monsoon. |
| 18. | LED lights: | YES | Institute Uses LED lights many of the points for Illumination requirements |
| 19. | Energy & environment | NO | |

| | | | |
|---|---|---|---|
| | monitoring systems | | |
| 20. | Save energy posters | YES | Institute has put Save energy posters in visible areas. |
| 21. | Energy management | NO | |
| 22. | Renewables (solar/wind) | YES | Institute has installed SPV Street Lights |
| 23. | Sensor based equipment | NO | |
| 24. | Switch off posters | YES | Institute has put Switch OFF posters in visible areas. |
| 25. | Emergency contact numbers list: | YES | Institute has put Emergency contact numbers lis in visible areas. |
| 26. | Health/medical facilities | NO | |
| 27. | Critical safety parameters: | NO | |
| 28. | Disaster management training | YES | Institute has people with Disaster management training. |
| 29. | Awareness, approach, Seminars | YES | Institute conduct/participate in seminars, lectures, symposiums for good environment awareness and approach. |
| 30. | Code of conducts, SOPs | NO | |

# 5. ENVIRONMENT AUDIT

## 5.1. Air Quality

| POLLUTANTS | PM 2.5 | PM 10 | O3 | CO | NO2 | SO2 |
|---|---|---|---|---|---|---|
| LIMIT | 35 | 150 | 21 | 35 | 10 | 6 |
| UNIT | µgm/m$^3$ | µgm/m$^3$ | µgm/m$^3$ | µgm/m$^3$ | µgm/m$^3$ | µgm/m$^3$ |
| VALUE | 20 | 18 | 7 | 1 | 9 | 1 |
| REMARK | OK | GOOD | GOOD | GOOD | GOOD | GOOD |

## 5.2. Water Quality

### 5.2.1. Water Quality

| Sr. No. | Category | Location | Quality | | | Usage |
|---|---|---|---|---|---|---|
| | | | TDS | PH | ORP | |
| 1. | Municipal / Local Body Water Supply | KHAREPATAN GP | 240 | 06 | 250 | Drinking |
| 2. | Bore well | CAMPUS. | NA | NA | NA | Gardening |
| 3. | Open Well | NA | 350 | 08 | 260 | NA |
| 4. | Any other source | NA | NA | NA | NA | NA |

### 5.2.2. Filtration

Reverse Osmosis (RO) 1 No AQUA MACHINEs found working

### 5.2.3. Water Balance

| SL NO | HEAD | UNIT | QUANTITY |
|---|---|---|---|
| 1 | AVERAGE DAILY OCCUPANTS | NO | 105 |
| 2 | AVERAGE DAILY VISITORS | NO | 10 |
| 3 | WATER REQUIREMENT FOR OCCUPANTS | LPD | 4725 |
| 4 | WATER REQUIREMENT FOR VISITORS | LPD | 150 |
| 5 | TOTAL WATER REQUIREMENT | LPA | 4875 |
| 6 | INHOUSE WATER SOURCE | LPD | 2000 |
| 7 | OUTSOURCED WATER | LPD | 3000 |
| 8 | HARVESTED RAIN WATER | LPA | 240000 |
| 9 | SURPLUS/SHORTFALL WATER | LPA | -735000 |

**Note:**

Considering 240days working and Total Roof area 200m$^2$ approximate and Average Rainfall is 1.2 meter/year

### 5.3. Atmosphere

| Sr. No. | BUILDING | LOCATION | Illumination | | Temperature | | Humidity | | Noise level | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | LUX | | $^0$C | | % | | db | |
| 1 | MAIN BUILDING – GROUND FLOOR | INDOOR | 160 | OK | 27 | OK | 50 | OK | 32 | OK |
| 2 | MAIN BUILDING – GROUND FLOOR | OUTDOOR | 255 | OK | 27 | OK | 50 | OK | 30 | OK |
| 3 | MAIN BUILDING – FIRST FLOOR | INDOOR | 155 | OK | 28 | OK | 48 | OK | 32 | OK |
| 4 | MAIN BUILDING – FIRST FLOOR | OUTDOOR | 272 | OK | 28 | OK | 52 | OK | 35 | OK |
| 5 | SECOND BUILDING – GROUND FLOORN | INDOOR | 140 | OK | 29 | OK | 55 | OK | 33 | OK |
| 6 | SECOND BUILDING – GROUND FLOORN | OUTDOOR | 260 | OK | 29 | OK | 52 | OK | 32 | OK |
| 7 | SECOND BUILDING – FIRST FLOOR | INDOOR | 150 | OK | 30 | OK | 58 | OK | 28 | OK |
| 8 | SECOND BUILDING – FIRST FLOOR | OUTDOOR | 252 | OK | 31 | OK | 52 | OK | 30 | OK |
| 9 | NEW BUILDING – GROUND FLOOR | INDOOR | 160 | OK | 28 | OK | 48 | OK | 29 | OK |
| 10 | NEW BUILDING – GROUND FLOOR | OUTDOOR | 256 | OK | 28 | OK | 48 | OK | 31 | OK |

### 5.4. Wastage Management

1. Do the premises generate wastage?
   YES-Minor
2. What type of wastage and quantity is generated? What are actions taken on it?

| Sr. No. | Wastage Type | Quantity | Action |
|---|---|---|---|
| 1. | Biomass | NA | NA |
| 2. | Paper | 100-500 KG | RECYCLE Through Third Party |
| 3. | Water | Non- Quantified | Recycle Plant Within the Campus |
| 4. | E-Waste | Non- Quantified | Planning To provide For Recycle |
| 5. | Bio-Hazardous | 2-3 Ltr | Liquid waste diluted by chemistry dept. |
| 6. | Fuel | NA | NA |
| 7. | Production | NA | NA |
| 8. | Process | NA | NA |
| 9. | Food | NA | NA |
| 10. | Man-Hours | NA | NA |

### 3. Recycling Procedures

1. Does Premises users aware about Recycle or Re-use of resources used?
   YES (Paper and E-waste)
2. Does institute run wastage and recycling awareness campaign for users?
   YES Periodical seminars
3. Does institute have SOP for wastage and recycling procedures?
   NO
4. Does Premises Recycle or Re-use resources used?
   YES Composting

### 4. Wastage Recovery & Conservation

a. Any Energy conservation method applied?
   YES LED LIGHTS

b. Any SOP on operation and maintenance is defined?
   NO
c. Any Energy conservation devices installed?
   NO
d. Any alternative Energy source is installed?
   YES SPV Street Lights
e. Does the SWITCH OFF Drills conducted regularly?
   YES
f. Are electronic and smart devices run on power saving mode? (computers, Etc)
   YES
g. Does electronic & other equipment run standby mode? How many hours?
   NO, Unnecessary energy / power consumption is prohibited.
h. Does institute perform Water quality monitoring?
   YES
i. Have you installed rain water harvesting system?
   YES
j. Any SOP on operation and maintenance of plumbing system is defined?
   NO
k. Any SOP on Water utilization is defined?
   NO
l. Does institute record water usage?
   YES
m. Are rooms well ventilated?
   YES
n. Does institute perform Air quality monitoring?
   NO
o. Any vehicles used? Type of Fuel? Quantity of fuel consumed?
   NO
p. Any third-party agreements for
   i. E-waste Pick-up agreements
      NO
   ii. Paper waste Pick-up agreements
      YES, WITH LOCAL VENDOR
   iii. Bio hazardous waste Pick-up agreements.
      NA
   iv. Chemical Pick-up agreements
      Dilution within campus

## 5.5. Carbon Footprint

### 5.5.1. Emission

| | | |
|---|---|---|
| **Electricity Consumption** | 16265 | **KWh** |
| **Diesel Consumption** | 0 | **Ltrs** |
| **Other Energy Consumption** | 0 | **$M^3$** |
| **Impact** | | |
| **Co2 Generated** | 10452 | Kg |
| **Water Equivalent** | 34271 | LTR |

### 5.5.2. Sequestration

#### 5.5.2.1. CO2

| Sl No | Method | Quantity | Saving |
|---|---|---|---|
| 1 | Trees | 69 | 1516 |
| 2 | Recycling Papers | 500 | 2000 |
| | **TOTAL** | | **3516** |

#### 5.5.2.2. WATER

Rain Water Harvested about 240000 Litters

### 5.5.3. Observations

Carbon Footprint of Institute is 99.54 per person

Carbon Sequestration of Institute is 33.48 per person

### 5.5.4. Recommendations

Carbon Sequestration is observed Less than sufficient.

Increase Green Measures.

## 6. Recommendations

**PART A GENERAL**

1. It is recommended that institute shall prepare and maintain Electrical SLD.
2. It is recommended that institute shall prepare and maintain Details Electrical Control Panels.
3. It is recommended that institute shall prepare and maintain Details of Transformer.
4. It is recommended that institute shall prepare and maintain Registers of Records
5. It is recommended that institute shall prepare and maintain Nameplate Data of all equipment
6. It is recommended that institute shall prepare and maintain Manuals of all equipment
7. It is recommended that institute shall preserve Electricity, Water and other utility bills.
8. It is recommended that institute shall prepare and maintain Log of Electrical works/accidents
9. It is recommended that institute shall provide safety equipments like Gloves, Shoes, Etc. for the workers.
10. It is recommended that Emergency evacuation plan to be prepared and displayed at centre place.
11. It is recommended that institute to assign anybody responsible to maintain data regarding audits, management and recommendations since It is found that institute is lagging in data keeping.
12. It is recommended that institute shall undergo Energy and Green Audit Every two years.

**PART B ENERGY AUDIT**

1. It is recommended that to Replace All existing Tubelights with LED Tubes.
2. It is recommended that to prepare feasibility and plant to replace regular fans with BLDC fans.
3. It is recommended that to undergo detail energy audit considering following points
    a. All the connected loads in each room has to be listed down
    b. All rooms working time has to be noted down.
    c. Any extra activity such as program/function/gathering, Etc. has to be recorded in terms of connected load, extra load, running time.
    d. Extra consumption in particular month and reason for the same.
    e. Manual and remote monitoring of consumption.
4. It is recommended that to Clean Luminaries, Fans, ACs regularly to increase efficiency.
5. It is recommended that Prepare and observe SOPs for maintenance of equipments.
6. It is recommended that Following tests are to be conducted at-least annually
    - Neutral Current
    - Load Unbalance
    - Earth Resistance
    - Insulation Resistance
    - Illumination
    - Power Quality
    - Thermography

**PART C GREEN AUDIT**

1. It is recommended that institute shall use environment friendly cleaning agents to clean the premises.
2. It is recommended that Institute may implement biogas plant from sewage waste.
3. It is recommended that Institute practices waste management but efforts are scattered, institute shall implement Target oriented waste management system.
4. It is recommended that Institute to install Energy & environment monitoring systems
5. It is recommended that institute shall implement Target oriented Energy management system.
6. It is recommended that institute shall implement Sensor based lights in passage.
7. It is recommended that institute shall have available Medical officer or to be empanelled nearby physician for emergency support.
8. It is recommended that institute shall undertake electrical safety Audit.
9. It is recommended that institute shall designate people and they shall undergo Disaster Management Training.
10. It is recommended that Avoid Draft printing, use email/Whatsapp maximum.
11. It is recommended that institute shall prepare observe and undergo Code of conducts and Standard Operating Procedures for Energy, Green and Environment management system.
12. It is recommended that institute shall arrange Exhibitions and identification programs for students and locals to understand medicinal plants.
13. It is recommended that institute shall start a planting drive with students outside campus.
14. It is recommended that institute shall gift small plants or seeds/seed-balls to students leaving or going to native place and encourage them to plant at their own premises.

**PART D ENVIRONMENT AUDIT**

i. It is recommended that institute shall plant and Maintain at-least 5 Full grown trees per person.

ii. It is recommended that institute shall consider the scope to increase in Tree diversity; Plants like Tulsi, Camphora,Etc. can be planted for getting more pollution-free atmosphere. Also to increase the quality more greenery can be implemented. This can be done through gardening in empty places, terrace gardening and Green walls.

iii. It is recommended that institute shall observe Quality from RO output. To maintain the quality, water testing has to be done in every season (after every four months). A standard operating process has to be defined, documented and observed for tank and pipeline cleaning and maintenance.

iv. It is recommended that institute shall Quantify the output of Rain Water Harvesting System and increase the capacity to mitigate shortfall.

v. It is recommended that institute shall Install Meters to measure actual demand and usage of water.

vi. It is recommended that institute shall maintain accurate level, windows to be cleaned regularly, obstacles on windows to be moved, Proper capacity and efficiency of luminaries to be used and luminaries also to be cleaned once in a week.

## 7. Disclaimer

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.

## 8. Conclusion

We hereby conclude report for "Energy Audit, Green Audit and Environment Audit" of the Work done under scope of work for "Kharepatan Panchakroshi Shikshan Prasarak Mandal 's Arts, Commerce and Science College, At & Post Kharepatan, Tal. Kankavli, Dist. Sindhudurg, Maharshtra-416703." Please study it thoroughly and implement recommendations and suggestions at earliest.

**Kharepatan Panchakroshi Shikshan Prasarak Mandal's Arts, Commerce and Science College,**
**Kharepatan At and Post. Kharepatan, Tal. Kankavli, Dist. Sindhudurg 416703**

# ANNEXURE-I
# BEST PRACTICES

## ENERGY, GREEN & ENVIRONMENT CONSERVATION

**PREPARED BY INTERNAL TEAM**

SUMMARY AND PHOTOGRAPHS OF ACTIVITIES ONGOING & DONE BY COLLEGE

**E-waste collection box:**


The college has introduced a wooden e-waste collection box, measuring 43x3x3, to promote environmental conservation and sustainable practices. The box is designated for collecting items like printers, monitors, CPUs, UPS units, mice, batteries, and keyboards. Collected e-waste will be responsibly handed over to a third party for proper management, ensuring that the college contributes to reducing electronic waste and protecting the environment.

**Dry-waste collection box:**


The dry-waste collection box at our college is a wooden structure measuring 43x3x3 inches. It is designed to collect various recyclable materials, including plastic items like pen cases, wrappers, bottles, straws, and bags, as well as cardboard packaging, metal scrap, and non-hazardous packaging materials. By segregating these waste items, the college aims to contribute to environmental conservation and promote sustainable practices. The collected waste is responsibly handed over to a third party for further management, reinforcing our commitment to reducing environmental impact and fostering a culture of sustainability.

**Paper-waste collection box:**


"Contribute to a greener campus by using this wooden Paper Waste Collection Box! Perfect for Old newspapers, Old Lecture Notes, Scrap paper from projects, Outdated textbooks, Magazines and brochures, Cardboard packaging, Receipts and tickets, Printed Used Assignments, Used Note books, Paper coffee cups (Unused and Waste), Paper towels and napkins, Posters from past events, Envelopes and packaging material, and more. Let's recycle by the help of third party. Together, we can reduce waste and promote sustainability at our college. Our college encouraged to all regarding “Drop off paper items here and help us build a cleaner, eco-friendly community."

## Cleaning:

## A. In Campus







Bandargaon, Maharashtra, India
HJ3G+G67, Bandargaon, Maharashtra 416703, India
Lat 16.55388°
Long 73.625379°
10/12/21 11:53 AM


Kharepatan, Maharashtra, India
Butterfly Garden, S N M VIDHYALAY, Kharepatan, Maharashtra 416703, India
Lat 16.553484°
Long 73.625249°
10/12/21 11:59 AM


Kharepatan, Maharashtra, India
Butterfly Garden, S N M VIDHYALAY, Kharepatan, Maharashtra 416703, India
Lat 16.553564°
Long 73.625242°
10/12/21 11:06 AM


GPS Map Camera Lite
HJ3G+G67, Kharepatan Rd, Bandargaon, Maharashtra 416703, India
Latitude
16.552699063695762°
Longitude
73.62472354663332°
Local 11:56:28 AM
Altitude -58.71 meters
GMT 06:26:28 AM
Tuesday, 01.24.2023


Kharepatan, Maharashtra, India
Butterfly Garden, S N M VIDHYALAY, Kharepatan, Maharashtra 416703, India
Lat 16.553274°
Long 73.624937°
25/01/22 12:04 PM


Bandargaon, Maharashtra, India
HJ3G+G67, Bandargaon, Maharashtra 416703, India
Lat 16.553586°
Long 73.625744°
01/03/22 10:38 AM


Bandargaon, Maharashtra, India
HJ3G+G67, Bandargaon, Maharashtra 416703, India
Lat 16.553684°
Long 73.625825°
13/07/22 09:15 AM


Bandargaon, Maharashtra, India
HJ3G+G67, Bandargaon, Maharashtra 416703, India
Lat 16.553709°
Long 73.626017°
22/07/22 11:17 AM


महाविद्यालयाची नवीन इमारत
परीसर स्वच्छता



## B. Out Campus





Pombhurle, Maharashtra, India
GH54+8P2, Pombhurle, Maharashtra 416811, India
Lat 16.508206°
Long 73.556071°
01/10/21 12:19 PM


Kelavali, Maharashtra, India
HMW3+XJV, Kelavali, Maharashtra 416702, India
Lat 16.59751°
Long 73.654156°
05/10/21 01:30 PM


Kelavali, Maharashtra, India
HMX3+5H4, Kelavali, Maharashtra 416702, India
Lat 16.597766°
Long 73.654124°
05/10/21 01:18 PM


Kelavali, Maharashtra, India
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Lat 16.597531°
Long 73.65415°
05/10/21 12:31 PM


Kelavali, Maharashtra, India
HMW3+XM8, Kelavali, Maharashtra 416702, India
Lat 16.597377°
Long 73.654203°
05/10/21 12:34 PM


Kharepatan, Maharashtra, India
Kharepatan - Chinchavali Rd, Kharepatan, Maharashtra 416703, India
Lat 16.56159°
Long 73.648963°
14/10/21 01:25 PM


Kharepatan, Maharashtra, India
Kharepatan - Chinchavali Rd, Kharepatan, Maharashtra 416703, India
Lat 16.558218°
Long 73.6332°
14/10/21 01:35 PM


Kharepatan, Maharashtra, India
Kharepatan - Chinchavali Rd, Kharepatan, Maharashtra 416703, India
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Nadgive, Maharashtra, India
Kochi - Panvel Hwy, Nadgive, Maharashtra 416703, India
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25/10/21 11:33 AM


Kajirde, Maharashtra, India
HJ2H+FJQ, Kajirde, Maharashtra 416703, India
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Long 73.627251°
09/12/21 12:07 PM


Kajirde, Maharashtra, India
HJ2H+FJQ, Kajirde, Maharashtra 416703, India
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Long 73.627239°
09/12/21 10:18 AM


Kajirde, Maharashtra, India
HJ2H+FJQ, Kajirde, Maharashtra 416703, India
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Long 73.62723°
09/12/21 10:24 AM


Nadgive, Maharashtra, India
GJQQ+8M6, Nadgive, Maharashtra 416703, India
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Long 73.639354°
17/12/21 02:59 PM


Nadgive, Maharashtra, India
GJQQ+8M6, Nadgive, Maharashtra 416703, India
Lat 16.538445°
Long 73.639354°
17/12/21 02:59 PM


Kelavali, Maharashtra, India
HMX3+5H4, Kelavali, Maharashtra 416702, India
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Long 73.654101°
19/12/21 11:42 AM


Pombhurle, Maharashtra, India
GH54+G7W, Pombhurle, Maharashtra 416811, India
Lat 16.509852°
Long 73.55518°
05/01/22 11:42 AM


Nadgive, Maharashtra, India
Kochi - Panvel Hwy, Nadgive, Maharashtra 416703, India
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Long 73.638462°
04/02/22 11:19 AM


Kharepatan, Maharashtra, India
HJ5G+C2V, Kharepatan, Maharashtra 416703, India
Lat 16.55753°
Long 73.624513°
14/02/22 12:36 PM
Google


Shot on OnePlus


Shivajipeth, Maharashtra, India
HJ59+4H9, Shivajipeth, Maharashtra 416703, India
Lat 16.556964°
Long 73.618655°
10/03/22 09:59 AM
Google


GPS Map
HMX3+8P4, Kelavali, Maharashtra 416702, India
Latitude
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Longitude
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GMT 07:49:17 AM
Saturday, 12.03.2022


Kharepatan, Maharashtra, India
HJ5G+C2V, Kharepatan, Maharashtra 416703, India
Lat 16.557614°
Long 73.62469°
02/06/22 10:38 AM
Google


Shivajipeth, Maharashtra, India
Kharepatan, HJ49+VCV, Shivajipeth, Maharashtra 416703, India
Lat 16.557214°
Long 73.6188°





Cleanliness conducted at Nadgive Grampanchayat Campus



मुंबई विद्यापीठ दत्तक
गांव पोंभुर्ले येथील
बाळशास्त्री जांभेकर स्मारक
ठिकाणी व परीसर स्वच्छता

***मुंबई विद्यापीठ दत्तक गांव***
***पोंभुर्ले येथे***
***हर घर तिरंगा अभियानपर***
***सार्वजनिक ठिकाणांची स्वचछता***






A comprehensive cleaning drive was conducted across the college premises, including classrooms, the library, washrooms, and the college ground. Both teaching and non-teaching staff actively participated in ensuring a clean and hygienic environment. The initiative extended beyond the campus, covering the home village of Kharepatan and the adopted villages of Pombhurle, Nadgive, and Kelavali, fostering community involvement and environmental stewardship. This collective effort emphasized the importance of cleanliness and contributed to a healthier and more welcoming atmosphere for everyone.

**Composting:**


The college has a composting pit that efficiently converts organic plant waste, food scraps, and garden waste into nutrient-rich compost, free from chemical fertilizers. This eco-friendly bio-fertilizer is used to enrich the college gardens, promoting sustainable practices and enhancing soil health. The initiative not only reduces waste but also fosters environmental responsibility within the college community.

**Vermi-composting**

The college has established a vermicompost bed, measuring 11x04x02 feet, that efficiently processes organic plant waste into nutrient-rich compost. This compost, free from chemical fertilizers, serves as a sustainable bio-fertilizer for the college gardens, supporting eco-friendly gardening practices and promoting a green, self-sufficient campus environment.

By recycling plant waste, the vermicompost system not only enhances soil health but also promotes robust plant growth on campus. This initiative reflects the college’s commitment to environmental conservation and sustainable agricultural practices, reducing dependency on synthetic fertilizers.

The use of vermicompost is a key step toward fostering sustainable gardening and agriculture on campus. The system exemplifies how recycling and reusing organic waste can create a positive environmental impact, reinforcing the college's dedication to nurturing a more sustainable future.

**Safe and waste free environment drive:**












A safe and litter free environment campaign is organized to promote cleanliness and safety in the college premises.

The Initiative focused on proper waste management, material reduction, reuse and promotion of recycling.

It involved active participation of students, faculty and staff in cleanliness activities, waste segregation and responsible disposal of hazardous materials.

The campaign aims to create a clean, safe and sustainable environment by fostering a culture of environmental responsibility in the college community.

By emphasizing waste reduction and safety practices, the campaign contributed to a healthier and more environmentally friendly campus.

**Sewage treatment**

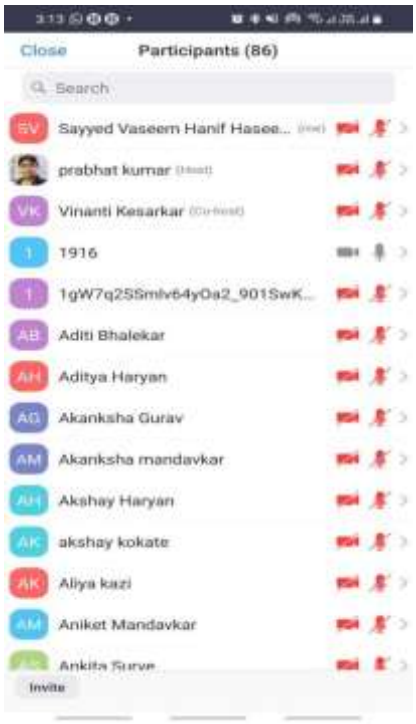
The waste water treatment in the college does not involve any process but water is supplied to the plants in the college premises through sewers.

**Waste management**


The college campus employs a comprehensive waste management system, segregating waste into organic, recyclable, and non-recyclable categories. Organic waste is composted using vermicompost beds, recyclables are sent to recycling centers, and non-recyclables are disposed of responsibly. Regular awareness programs and clean-up drives support these practices.

In Kharepatan, waste management focuses on community involvement in waste segregation and composting, with efforts aimed at reducing waste generation. For the adopted villages—Pombhurle, Nadgive, and Kelavali—local initiatives promote waste segregation and composting, supported by educational programs to enhance waste management practices. These efforts contribute to cleaner, healthier environments in all areas.

## Swachh bharat campaign







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Friday, 10.21.2022


GPS Map
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Friday, 10.21.2022


GPS Map Camera
Kharepatan, Maharashtra, India
Kharepatan ST Depot, Kharepatan Rd, Kharepatan,
Maharashtra 416703, India
Lat 16.555805°
Long 73.622275°
22/10/22 12:25 PM GMT +05:30
Google


GPS Map Camera
Nadgive, Maharashtra, India
GJMQ+GGQ, Nadgive, Maharashtra 416703, India
Lat 16.53429°
Long 73.638411°
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Google


GPS Map Camera
Nadgive, Maharashtra, India
GJMQ+GGQ, Nadgive, Maharashtra 416703, India
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Google


GPS Map Camera
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Maharashtra 416703, India
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Long 73.622302°
22/10/22 12:21 PM GMT +05:30
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GPS Map
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GMT 06:38:53 AM
Saturday, 10.22.2022


GPS Map Camera
Pombhurle, Maharashtra, India
GH54+GC9, Pombhurle, Maharashtra 416811, India
Lat 16.508323°
Long 73.556278°
20/10/22 11:54 AM GMT +05:30
Google



The Swachh Bharat Campaign at the college campus, in Kharepatan, and in the adopted villages of Pombhurle, Nadgive, and Kelavali has been an extensive effort to promote cleanliness and sanitation. The campaign employed various methods including lectures, semibars orientation, workshop, street plays, rallies, personal meetings, mouth publicity, and poster making to engage and educate the community. These activities aimed to raise awareness about hygiene practices, encourage proper waste management, and foster a culture of cleanliness. The campaign's diverse approach effectively reached different segments of the community, reinforcing the importance of a clean and healthy environment.

**Water resources**

The college utilizes a well on campus as a primary water source and receives additional water supply from the Kharepatan Gram Panchayat. The well provides a reliable, on-site water resource for daily needs, while the Panchayat ensures a consistent and adequate water supply to complement this. This combination supports effective water management, helps maintain the college's operations, and addresses the needs of various facilities. By leveraging both local and external sources, the college ensures a stable water supply, contributing to its overall sustainability and operational efficiency.

**Rain water harvesting:**


The college has an established rainwater harvesting system that captures and stores rainwater for reuse. This collected rainwater is utilized in the washrooms and toilets within the college premises. By integrating rainwater harvesting, the college reduces its reliance on external water sources and promotes sustainable water management practices. This system helps conserve water, reduces utility costs, and supports the college's commitment to environmental sustainability.

**Waste water treatment:**


The college has implemented a waste water treatment system involving the excavation of pits measuring 4x6x4 feet to manage liquid waste. These pits are designed to collect and treat wastewater through natural processes. The system facilitates the breakdown of organic matter and helps in minimizing environmental impact by preventing pollution. The treated water can be safely disposed of or repurposed, contributing to a sustainable waste management practice on campus. This approach demonstrates the college's commitment to effective wastewater management and environmental responsibility.

**Ro / water treatment**


The college has implemented an RO (Reverse Osmosis) water treatment system in conjunction with water coolers to ensure the availability of clean and safe drinking water. The RO system effectively removes impurities, contaminants, and excess minerals from the water, providing purified water for consumption. Water coolers are installed to maintain the water at a refreshing temperature, enhancing accessibility and comfort for students and staff. This integrated approach to water treatment and cooling supports the health and well-being of the college community by ensuring high-quality drinking water.

**Greenery:**


Bandargaon, Maharashtra, India
Lat 16.554029°
Long 73.625473°
14/08/21 11:41 AM


Bandargaon, Maharashtra, India
Lat 16.553523°
Long 73.625602°
14/08/21 11:22 AM


The institute's commitment to environmental sustainability is reflected in its efforts to maintain and enhance greenery on campus. The lush green surroundings create a serene atmosphere, contributing to both the aesthetic and ecological value of the campus. Additionally, the campus has been developed as a "Butterfly Campus," with specific plants and flowers cultivated to attract and support various butterfly species. This initiative not only beautifies the campus but also fosters biodiversity, making the college a haven for local wildlife. The combination of greenery and butterfly-friendly habitats exemplifies the institute's dedication to environmental stewardship.

**Plantation: (trees and plants in campus)**


The institute conducted a plantation drive on campus to enhance the green cover and promote environmental sustainability. Various types of trees and plants were strategically planted across the campus, contributing to the beautification and ecological balance of the area. This initiative not only aimed to improve the campus environment but also served as an educational opportunity for students to learn about the importance of tree plantation and environmental conservation. The drive reflects the institute's commitment to creating a greener, healthier, and more sustainable campus for the future.

**Plantation drive by the institute: (trees plants outside campus)**






रा.से.यो.कक्ष व खारेपाटण
ग्रामपंचयत यांच्या संयुक्त विद्यमानाने
सामूहिक वृक्षारोपण




The institute organized a comprehensive plantation drive in its home village, Kharepatan, and the adopted villages of Pombhurle, Nadgive, and Kelavali. The campaign aimed to enhance green

cover and promote environmental awareness. The initiative included the planting of trees and plants outside the campus, contributing to the ecological balance in these rural areas.

To maximize community involvement, the drive featured street plays, rallies, personal meetings, mouth publicity, and poster-making activities. These efforts raised awareness about the importance of tree plantation and encouraged local residents to actively participate in preserving their environment.

**LED lights:**


The college has installed LED lights throughout the campus as part of its energy-saving initiatives. LED lights are highly efficient, consuming significantly less electricity compared to traditional lighting. This transition not only reduces energy consumption but also lowers electricity costs and contributes to the college's sustainability efforts. The use of LED lights reflects the college's commitment to adopting environmentally friendly technologies and promoting energy efficiency across the campus.

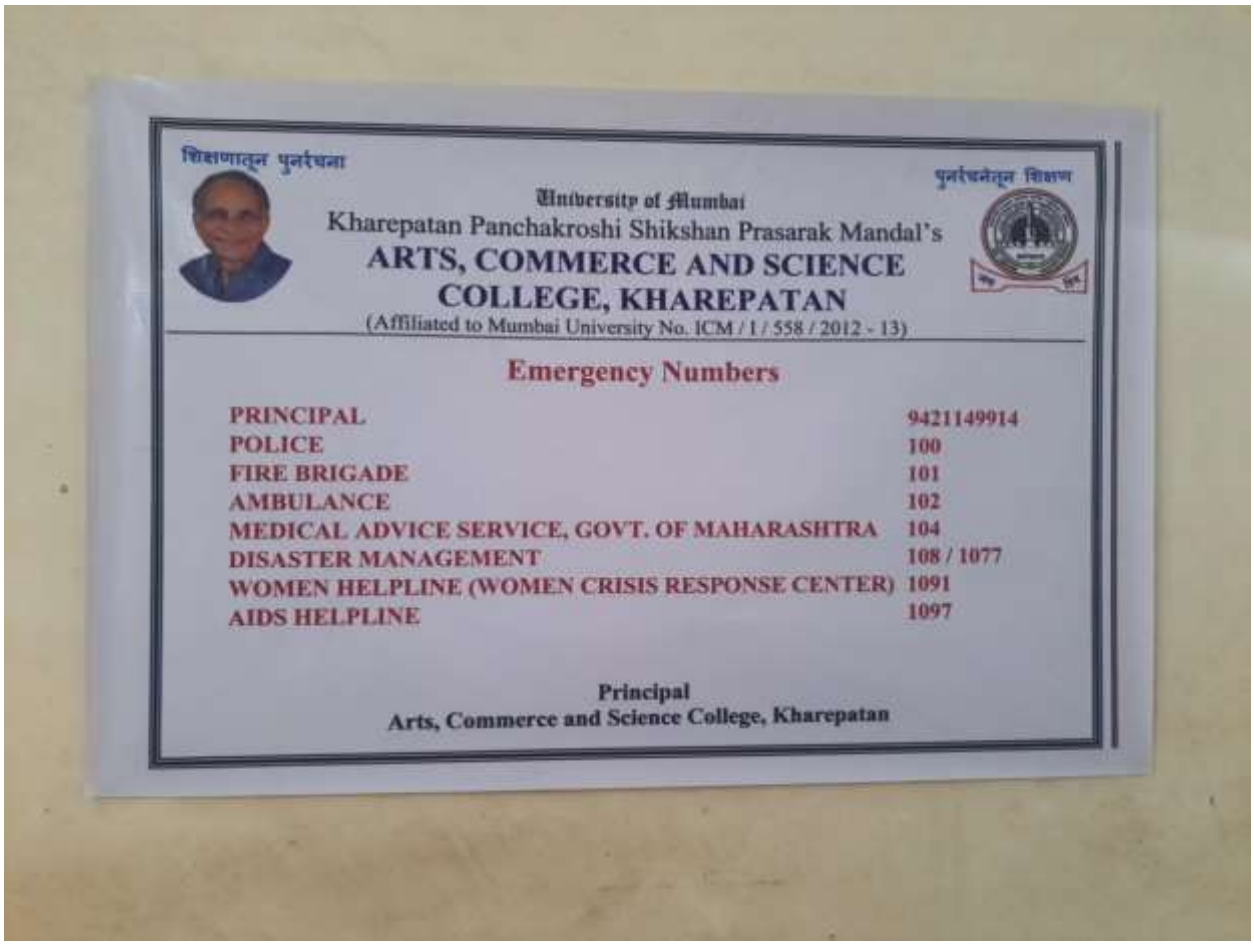
**Save energy posters**


“Save Energy” posters were prominently displayed throughout the college campus, including in classrooms, hallways, and common areas. These posters serve as daily reminders for students, faculty, and staff to conserve electricity by turning off lights, fans, and electronic devices when not in use. The initiative is part of the college’s ongoing efforts to promote energy conservation and foster a culture of sustainability among the campus community.

**Switch off Poster**


“Switch Off” posters were strategically placed in the entry porch, each building, and every classroom of the college. These posters serve as constant reminders for students, faculty, and staff to turn off lights, fans, and electrical devices when not in use. The initiative is part of the college’s broader effort to promote energy conservation and reduce unnecessary electricity consumption. By displaying these posters in prominent locations, the college encourages everyone to actively participate in saving energy and fostering a more sustainable campus environment.

**Emergency Contact List:**




A list of emergency contact numbers has been compiled and is prominently displayed across the college office and campus. These include contacts for local police, fire services, ambulance, nearby hospitals, and the college security office. This initiative ensures that in case of any emergency, students, faculty, and staff can quickly reach the necessary services, enhancing safety and preparedness on campus.

**Health or medical facilities**





The college established a Health Center to provide essential medical services to students and staff. Nearby doctors regularly visited the center to offer consultations and medical care. Additionally, various health camps were organized, including health check-ups, HB testing, HIV/AIDS testing, and blood group testing. These initiatives aimed to monitor and improve the overall health and well-being of the college community. The comprehensive medical services and regular health screenings underscored the college's commitment to ensuring a healthy and safe environment for all its members.

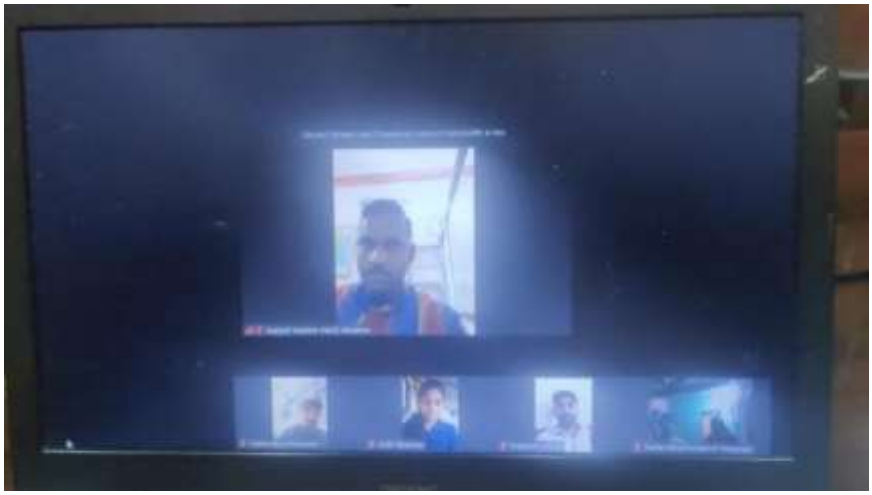
## Critical safety parameters

**Disaster management training**

Disaster management training was conducted through the State Level AVHAN program, which included participation from candidates and NSRF Jawans. The training covered a range of topics

related to disaster preparedness and response, equipping participants with essential skills and knowledge. Candidates were trained in various aspects of disaster management, while NSRF Jawans provided practical insights and demonstrations. This comprehensive training aimed to enhance the participants' ability to effectively manage and respond to disasters, ensuring better preparedness and resilience in emergency situations.

**Seminars**

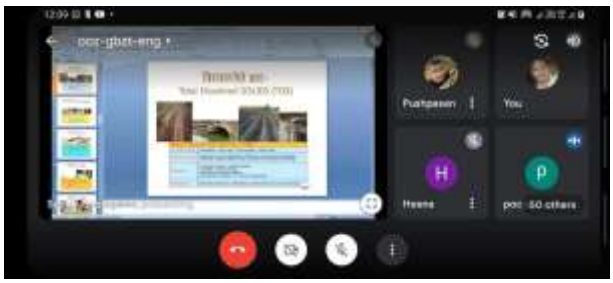

The seminars on “Save Energy,” “Greenery,” and “Save Environment” were organized to educate and inspire participants about sustainability. The “Save Energy” seminar highlighted methods for reducing energy consumption and promoting efficiency, featuring an internal expert from the college’s engineering department and an external guest from a local energy conservation organization. The "Greenery" seminar focused on increasing green spaces and planting trees, with presentations from a college faculty member specializing in environmental science and an external horticulturist. The “Save Environment” seminar addressed various environmental challenges, including waste management and pollution control, led by an in-house environmental studies professor and an external environmental activist.

Online and offline seminars, orientations, lectures, workshops, and conferences were conducted on various aspects related to saving the environment. These initiatives aimed to raise awareness

and encourage proactive measures for environmental conservation, fostering a commitment to sustainable practices among students and the community.

Additionally, awareness campaigns were conducted both within the college and in the surrounding areas, including the home village of Kharepatan, University-adopted villages Pombhurle and Nadgive, and College-adopted village Kelavali. These efforts extended the reach of the environmental message, engaging a broader audience in the commitment to sustainability.

**Awareness, approach, code of conduct**





**Awareness:** The institute prioritizes raising awareness about environmental sustainability and effective waste management. This involves educating students, staff, and the community through workshops, seminars, and campaigns. The goal is to promote understanding and encourage responsible practices.

**Approach:** The approach involves a holistic strategy, integrating various environmental initiatives such as waste management, water treatment, and greenery enhancement. It emphasizes active participation from all stakeholders and the adoption of best practices for sustainable development.

**Code of Conduct:** The code of conduct outlines expected behaviors and responsibilities related to environmental conservation. It includes guidelines for proper waste disposal, resource

conservation, and adherence to sustainability practices. Compliance ensures a collective effort towards maintaining a green and safe campus.

**Others**



N
SMOKING
TOBACCO FREE
CAMPUS
Pledge for Life!


DANGER