

GREEN AUDIT

STUDY PERIOD (TWO YEARS) 2020-2021 AND 2021-2022

Sustainability study

AUDIT REPORT

Studied for

Maharshi Karve Stree Shikshan Samstha's
Cummins College of Engineering for Women
Karvenagar, Pune – 411052

Studied in the capacity of

An accredited & Certified Green Building Professional



Studied by

Greenenvia
Solutions

Valid till **October 2023**



Hereby presents

An Eco-friendly premises
that has executed
more than 90% elements
required for a Green Building

One of India's first technical institute for girl students

Cummins College of Engineering for Women
Affiliated to the Savitribai Phule Pune University



Disclaimer

The Audit Team has prepared this report for the **Maharshi Karve Stree Shikshan Samstha's Cummins College of Engineering for Women** located at Karvenagar, Pune – 411052 based on input data submitted by the Institute and 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 a 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 Institute. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements, or forecasts in the report.

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

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is an Accredited and Certified Green Building Professional-Architect; I.A.(IMS) 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 an 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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Acknowledgment

The Audit Assessment Team thanks the **Maharshi Karve Stree Shikshan Samstha's Cummins College of Engineering for Women, Pune, Maharashtra** for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Hon. Mr. Ravindra Deo**, Chairman, MKSSS; **Shri. Rajendra Jog**, Trustee, MKSSS; **Dr. P.V.S. Shastry**, Secretary, MKSSS and everyone from the Management.

Our heartfelt thanks to the Chairperson of the entire process **Dr. Madhuri Khambete**, Principal, for the valuable input.

We are also thankful to **Institute's Taskforce** who have been instrumental in the data collection – **Dr. Vikram Athalye**, Dean Q.A.; **Dr. Dipali Ramdasi**, Associate Dean Q.A. (*Special mention for the excellent coordination*); **Mr. Vishal Deore**, Assistant professor in Civil Engineering; **Ms. Manjiree Kolhatkar**, Assistant professor in Civil Engineering; **Ms. Deepali Kumawat**, Assistant professor in Civil Engineering; **Ms. Sneha Singh**, Assistant professor in Civil Engineering; **Ms. Mrunal Moharir**, Assistant professor in Electrical Engineering; **Ms. Milly Thomas**, Assistant professor in Electrical Engineering; **Ms. Bageshree Khadye**, Technical Assistant in Civil Engineering; **Ms. Madhuri Malwadkar**, Technical Assistant in Civil Engineering and **Gore Revati Vasant**, Registrar.

We highly appreciate the assistance of **Wayachal Prashant**, Office superintendent; **Darekar Sarita**, Accountant; **Deo Pallavi**, Jr. Clerk; **Sawant Bharat Ankush**, Peon; **Erande Suresh Tukaram**, Electrician; **Singh Sanjeev S.**, Electrician; **Ravikiran Holkar**, Technical Assistant in computer Engineering; **Chetan Godse**, Technical Assistant in Electronics and Telecommunication Engineering; **Rajashree Padalkar**, Technical Assistant in Instrumentation Engineering 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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1. Introduction

1.1 About the Institution

Cummins College of Engineering for Women is the first all women engineering college in India established with the support of Cummins Diesel (India) Foundation. Parent institution of Cummins College is Maharshi Karve Stree Shikshan Samstha (MKSSS). 'Bharat Ratna' Recipient, Maharshi Karve, established MKSSS in 1896 with the mission of women empowerment through education.

The Institute is recognized for its rigor in academics and dedicated faculty, successful alumnae being its outcome. It has a strong association with the industry and is recognized for providing quality recruits for the industry.

1.2 Statements prescribed by the Institute

1.2.1 Vision

The College proposes "To be a globally renowned institute for imparting quality education and development of women leaders in engineering and technology."

1.2.2 Mission

The College adheres and focuses "To develop women professional who are academically and technically competent with strong professional ethics"

1.2.3 Motto

The College has works towards "Empowerment of Women through Education."

The commitment of the Institute is towards continuous improvement and democratic functioning, as is reflected in its vision and mission statements, which in turns become the guiding principles for the governance of the Institute.

1.3 Assessment of the Institute

1.3.1 Affiliations

The Institute is affiliated to **Savitribai Phule Pune University**, one of the premier universities in India, is positioned in the North-western part of Pune city.

1.3.2 Certification

The College has received the following Certifications

- NIRF – Participated in the National Institutional Ranking Framework and has secured position in rank band 200 -250 for the year 2022 and 2021. The institute secured rank 173 in 2020.
- AISHE – The All India Survey of Higher Education code is C-42242.

1.3.3 Accreditation

The following are details of the accreditation awarded by the National Assessment & Accreditation Council (NAAC) to the College.

Cycle	First	Second	Third
CGPA	70-75	3.33	3.16
Grade	B	A	A
Year	2002	2012	2017

Table 1: NAAC Accreditation details of the Institute

The College is due to enter its Fourth cycle of NAAC.

1.3.4 Recognitions

The college is affiliated to Savitribai Phule Pune University, Pune under the UGC scheme for autonomous colleges **for a period of six years w.e.f.2016-2017 to 2021-2022.**

1.3.5 Approval

The technical courses provided by the College are approved by **All India Council for Technical Education (AICTE), New Delhi.**

1.4 Achievements of the Institute

The Institute has a tremendous track record of excellence in Built form and educational services provided, below are some of the achievements of the prestigious Institute.

- **The College ranked 22 in All India Private Engineering Colleges according to 'The Week'.**

⇒ **Best College Award by Savitribai Phule Pune University, 2020-2021.**

⇒ **In local media 'Outlook'**

⇒ 2022 :- Rank 37 in Private colleges

⇒ 2021 :- Rank 42 in Private colleges

⇒ 2020 :- Rank 46 in Private colleges

⇒ **In the local media 'India Today'** among overall Private Engineering College

⇒ 2022 :- Rank 49

⇒ 2021 :- Rank 54

⇒ 2020 :- Rank 68

1.5 Research and Innovation

The College integrates multiple curriculum programs through its unique research and development activities. The goal is "To develop an integrated R&D environment that will promote and strengthen the research activities in the institute, to meet the immediate as well as futuristic requirements of the Industry and Society and thus improve the quality of various study programs at the College."

1.6 Facilities

The College is one of India's first Institute of Engineering for girl students. It has an excellent state of the art infrastructure. The College emphasizes on latest technological advancement through its educational initiatives. Some of the key facilities are listed below.

- ⇒ Auditorium
- ⇒ Conference halls
- ⇒ Outdoor sports areas
- ⇒ Workshop areas
- ⇒ Break-out spaces in the Indoors of the premises
- ⇒ Hostel

2. Institution overview

2.1 Populace analysis for the 2020-2022

2.1.1 Students data

The student data (shared by the Institute) shows there were an **approximately 2,500 Girl students** on the premises in both academic years.

2.1.2 Staff data

The staff data shows the premises had an approximate of **300 Staff Members** on the premises in both academic years.

2.2 Total Institute Area & Institute Building Spread Area

The **total site area is 4 acres** and the **total Built-up area of the Institute is 40,870.57 sq. ft.** for a total of **3,000 footfalls.**

2.3 Institute Infrastructure

2.3.1 Establishment

The Institute was established in 1991.

2.3.2 Spatial Organisation

The overall ambiance of the Institute is warm and inviting. The Architectural style of exposed bricks provides a soothing and contrasting feel to the built-form. The colour palate of earthy colours in the facades helps the building stand out positively.

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

2.4 Operation and Maintenance of the premises

The interview session was held with the staff regarding the operation and working hours. The schedule is mentioned below.

- **Main Institutional areas** - 7:30 am to 6:00 pm, Monday to Friday and 10:00 am to 2:00 pm on Saturdays for around 250 days (Approximate).
- **Library areas** – 7:30 am to 7:30 pm, Monday to Saturday and 9:00 am to 1 pm on Sundays usually for around 320 days (Approximate).

DETAILED REPORT

3. Green Building Study as a Research based technical audit

3.1 About the Green Building Study Audit

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

3.2 Analysis of the Green Building Study Audit

The procedure included detailed verification for the following:

Energy Audit

- Analysis of the Lights, Fans, AC, Equipment
- Renewable energy
- Scope for reducing the current energy bills if any
- Improvement in the thermal comfort of the premises

Green Audit

- Green initiatives
- Hygiene audit
- Water Audit - Analysis of the current water consumption of campus; Rainwater harvesting and Wastewater treatment on the premises.
- Waste Audit - Current waste produced, its segregation, and usage; Strategies to be adopted for waste management and awareness

Environmental Audit

- Analysis of the current landscape + hardscape of the premises
- Analysis of the flora and fauna of the premises
- Strategies adopted at present to enhance vegetation
- Measures that can be adopted for ecological improvement of the premises.

3.3 Strategy adopted for Green Building Study Audit

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

3.4 Activities undertaken for the Green Building Study Audit

- 01 August 2022 - Allotment and Initiation by the Institute
- 08 August 2022 - Induction Meeting
- 25 August 2022 - Review Meeting
- 23 September 2022 - Survey of students and staff completed
- 28 September 2022 - Site visit at the Institute
- 20 October 2022 - Submission of the Report

On-site investigation and physical verification

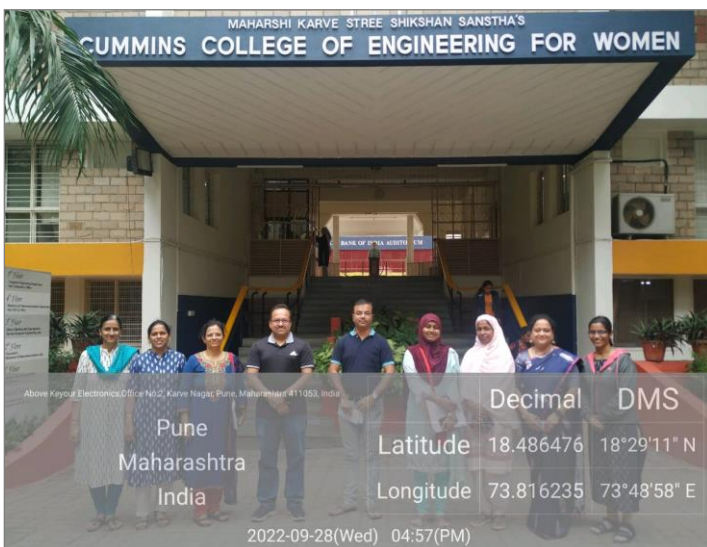
Audit Team during the visit on 28 September 2022



On-site review with the Team



Induction meeting with the Team and inspection of the Universal toilet



Group photo with the Team

Green practices

Background reference image Free photos on pixabay

4. Green Practices Audit

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

4.1 Green practices

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

- **Multiple sustainable initiatives** - *The College has aspects such as compost pit, vermin-compost pit, biogas plant, waste water treatment system, rain water harvesting; almost all of the practices required for a sustainable premises are adopted by the Institute.*
- **Social awareness** - *The College has taken up awareness drives on various social issues for rural upliftment and regeneration in the college and surrounding villages.*
- **Fresh environment** – *The College provides an eco-friendly ambience with fresh air and soothing environment which helps to maintain a physical and mental balance. This kind of a space it a must for an educational specially technical institute which is inviting and gives the stakeholders an opportunity to explore indoor and outdoor learning to a great extent.*
- **Universal design** – *The College premises has special provisions such as ramps, lifts for the specially abled.*
- **Team work** – *The best quality of the College which sets it apart is its coordinating, cooperative staff members; for a building the foundation plays the most important role for its future similarly for an educational institute its staff members do.*
- **Garden committee** – *The College has a distinguished garden committee who is responsible for the beautification for the premises. This team undertakes a lot of activities related to the enhancement of the landscape features of the premises. As part of our research what we observed as the best feature was the involvement and enthusiasm of each member in this activity.*

4.2 Community Development

The students of the College are involved in multiple community development programs. Apart from it the Samstha to which the College is associated with undertakes a lot of social welfare initiatives which include Old age home, orphanages, women empowerment and a number of community development programs for all.

4.3 Eco-friendly initiatives undertaken

The Institution has undertaken the following initiatives towards environment measures.

- **Virtual plantations drive held between 27 to 31 July 2021.**
- **Celebration of the Earth day through lectures on 'Energy form waste – circular economy' and 'Biodiversity' on 22 April 2022.**

4.4 Survey Results

An online survey was conducted to analyse the student and staff views about the Energy management practices adopted in College, following is the result received.

4.4.1 Participation

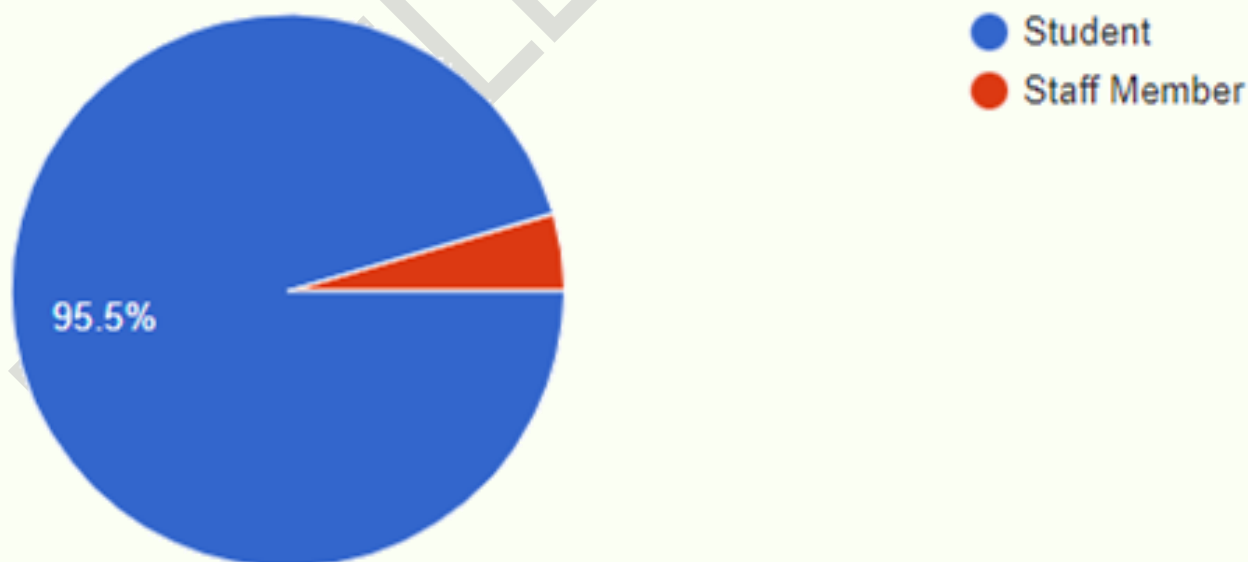


Figure 1: Participation analysis in the survey

A total of **974 responses** were received out of which 96% were students.

Note about the review-rating survey

The Participants were asked to review (Though an online mode) the practice on a scale of 1-5 with scale components as follows:

- Scale 1 – Poor
- Scale 2 – Satisfactory
- Scale 3 – Good
- Scale 4 – Very good
- Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)

4.4.2 Rate the Green awareness practices in College

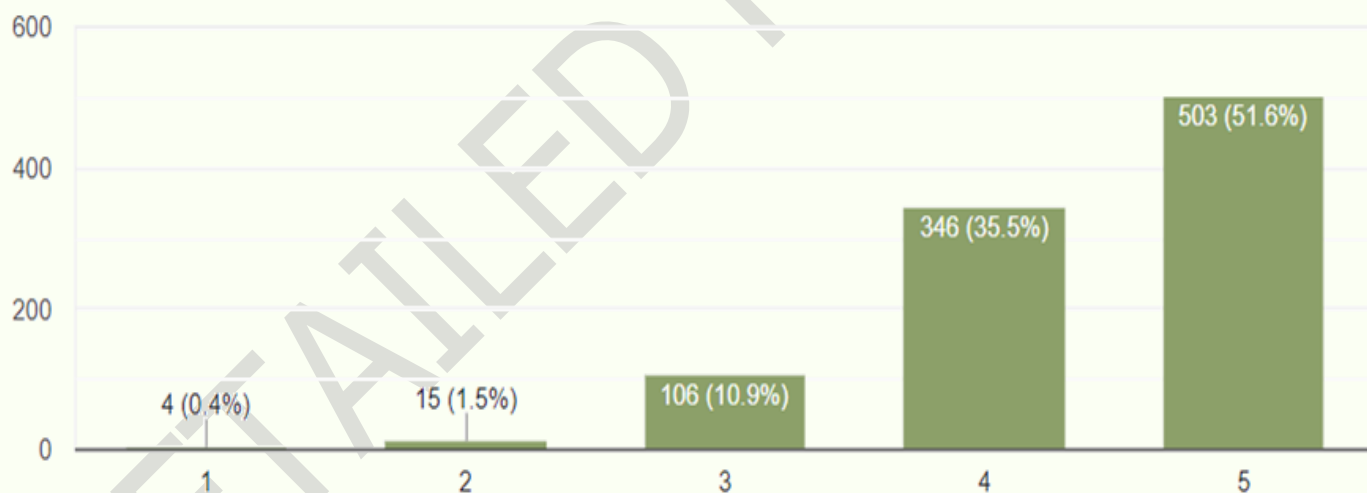


Figure 2: Green awareness practices in College

There were mixed responses received the highest was for **rating 5 (Excellent) at 52%** followed by **36% for rating 4 (Very good)**.

4.4.3 Does your College conduct environment awareness programs/ webinars/ plantations/ cleanliness or similar programs?

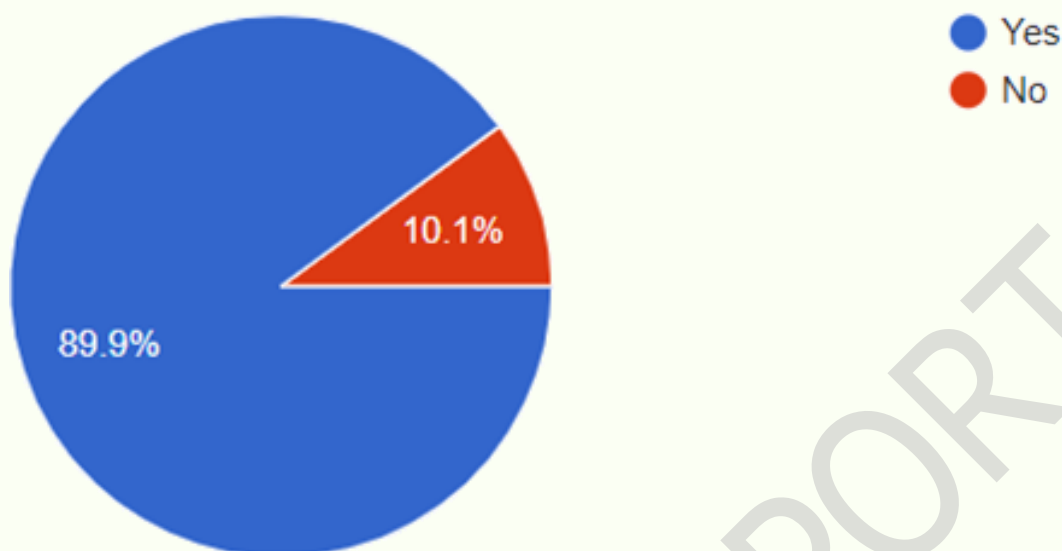


Figure 3: Confirmation of the environment awareness programs/ webinars/ plantations/ cleanliness or similar programs conducted by the College

The students, staff **90%** of responses confirmed activities are conducted which is very excellent.

4.4.4 Do you participate in such events?

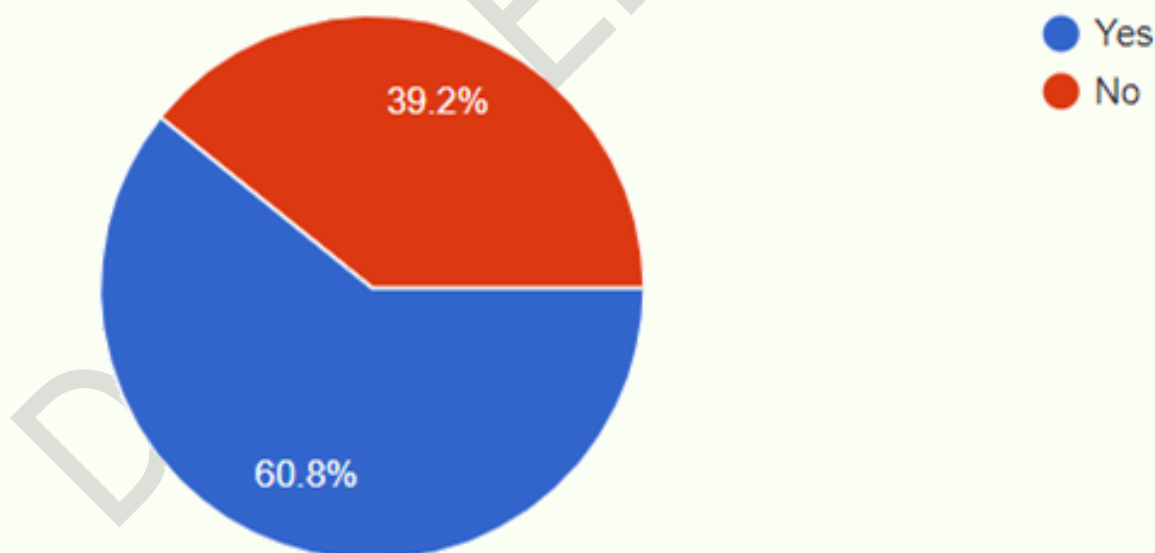


Figure 4: Participation in the environment awareness programs/ webinars/ plantations/ cleanliness or similar programs conducted by the College

The students, staff **almost 61%** of the responses confirmed their participation, **this response needs a lot of improvement; creative techniques should be adopted by the Institute to involve the students participation.**

4.5 Recommendations related to section 'Green practices audit'

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.**

⇒ Environmental awareness

There can be various artworks on the compound wall giving the message of saving the environment through the joint efforts of the students and staff thereby making the student socially and environmentally responsible citizens.

⇒ Tree adoption scheme

The college can adopt the One Faculty – One tree adoption scheme which is one of its kind practice, this can be very beneficial, especially during the summer season.

⇒ Plant as a gift

As a kind gesture, the guests visiting the premise can be asked to plant a small plant on the premise itself and they can be even given plants/bouquets from the flowers of the plants on the premise as a gift.

⇒ Signages on the plants mentioning scientific names

The practice of having the names of each plant and tree will provide awareness among the staff and students. At present only about 10% of the plantations in the premises have this practice adopted.

Sapling plantation activity proposed and undertaken by the College with the Audit Team during the visit on 28 September 2022



Mechanical Engineering Building, Sangunabai Shoj Path, Inside G.D. Somaiya College Of Engineering For Women, Karve Nagar, Pune, Maharashtra 411002, India

Pune
Maharashtra
India

	Decimal	DMS
Latitude	18.485848	18°29'9" N
Longitude	73.816405	73°48'59" E

2022-09-28(Wed) 05:00(PM)



Mechanical Engineering Building, Sangunabai Shoj Path, Inside G.D. Somaiya College Of Engineering For Women, Karve Nagar, Pune, Maharashtra 411002, India

Pune
Maharashtra
India

	Decimal	DMS
Latitude	18.485851	18°29'9" N
Longitude	73.816404	73°48'59" E

2022-09-28(Wed) 05:01(PM)

Waste Audit



Background reference image Polina Tankilevitch on pexels

5. Waste Audit

Waste is an inevitable part of our lives. Over the years as the awareness about waste management techniques has given a rise to rethink how the waste can be avoided from being sent to the landfills. The audit provides an approximation of the types of waste generated, location of waste collections, disposal techniques used, waste segregation methodologies adopted, waste management strategies that are and implemented in addition to the newer ways the can be adopted aiming to make the premise clean and sustainable. Here sustainable refers to a broader aspect to analyse whether the current techniques are having positive or negative effect on the stakeholders of the premises.

5.1 Waste produced

5.1.1 Types and disposal of waste in Premises

S. No.	Type of waste	Source and quantity	Current Disposal method	Can be treated/ recycled?	Methodology
1	Solid waste	Toilets–Biodegradable waste	TREATED – Biogas plant	Yes	CONTINUE - with the current practice
2	Paper waste	Newspaper and other paper	Given to the vendor	Yes	TREATED – A recycling plant can be proposed
3	E-waste	Computers - Non-biodegradable waste as per the annual year usage	Given to vendor	Yes	CONTINUE - with the current practice
4	Dry waste in form of leaves	Open space & plantations, papers - Non biodegradable waste	TREATED – Organic, Vermi composting is undertaken	Yes	CONTINUE - with the current practice
5	Liquid waste	Toilets, washbasins – Around 100 – 120 litres per week during general times and 50 litres at present	TREATED - Sewage treatment plant	Yes	CONTINUE - with the current practice
6	Organic regular waste	Dust, dirt usually dry waste from Canteen and all sources – approx. 10 to 15 kg	TREATED – Organic, Vermi composting is undertaken	Yes	CONTINUE - with the current practice

Table 2: Summary of the types of waste produced in the premises

5.1.2 Bins summary

There are 319 Dustbins in the premises with volume of 7 litres (small), 15 litres (medium); 30 litres (large) and 50 litres (extra-large) made up of plastic material.

5.2 Waste handling

Quantification wise as per Interview and survey it was found the following type of waste is Solid, Liquid, Hazardous Waste, Dry leaves, E-Waste, Canteen waste, Unused Equipment waste is collected. The waste produced on premises is segregated. It is collected on a weekly basis. The waste is not handed over to the local municipality van. There is a dumping pit in the garden which should not be there.

5.3 Waste management

Ample measures are taken to maintain hygiene. No smell problem or health related issues due to the waste are there. There are adequate numbers of bins present in all parts of building. The waste does not pollute the ground or surface water. There is no problem of air pollution from waste as informed. The wastes from toilets are discharged to main drains through underground covered channels (Safety Tanks) thus avoiding any incident.

In addition, to general practices the college has following dedicated practices which yield positive results.

- *A compost & vermin-compost pit having capacity 12 cu. m in about 5 nos.*
- *There is availability of biogas plant in the Samstha with a daily waste generated of 350-400 kg waste.*
- *A waste-water treatment plant where around 5,000 litres of water is recycled on a daily basis.*

5.4 Survey Results

Note about the review-rating survey

The Participants were asked to review (Though an online mode) the practice on a scale of 1-5 with scale components as follows:

- Scale 1 – Poor
- Scale 2 – Satisfactory
- Scale 3 – Good
- Scale 4 – Very good

➔ Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)

Rating for the views regarding the Waste management practices adopted in College, following is the result received.

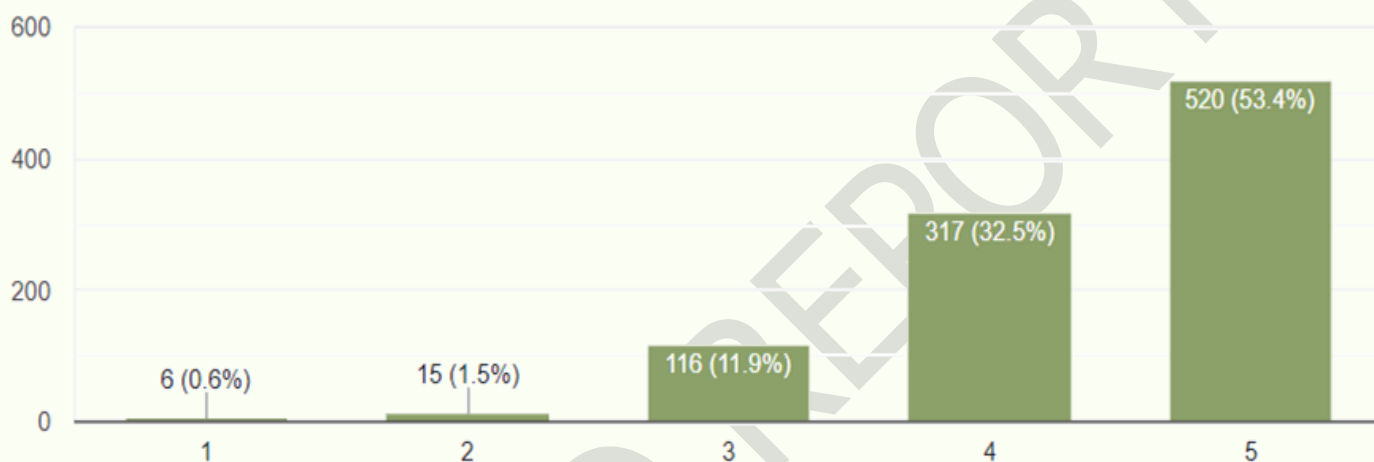


Figure 5: Waste management practices in College

There were mixed responses received the highest was for **rating 5 (Excellent) at 53%** followed by **33% for rating 4 (Very good)**.

5.5 Recommendations related to section 'Waste Audit'

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.**

➔ **Signages**

Messages about avoiding wastage should be placed at appropriate locations.

➔ **Dustbins at every 100m**

There should be a dustbin at every 50-100 in the open spaces

➔ **Material of the dustbin**

The current plastic dustbins should be replaced with eco-friendly material.

Water Audit



Background reference image Vlad Chetan on pexels

6. Water Audit

Water is one of the basic needs. Pure drinking water is a resource which needs to be preserved efficiently. Water audit helps to identify the sources of water consumption, the water requirement by the campus met by these sources. The points and effective usage of without any wastage. Understanding the techniques which are best suited to the site to increase water conservation in terms of awareness and practice.

6.1 Water availability and consumption

6.1.1 Sources of Primary water supply

The primary water supply refers to the drinking water. The main source of water is the Local Municipality. The water received is stored in water tanks at various locations. These are periodically cleaned and well maintained for hygiene purpose. **At present there are a total of 12 tanks available in the premises. These serve dual purpose of primary and secondary (partial) use.**

6.1.2 Sources of Secondary water supply

The secondary source of water supply refers to the general usage water. In an educational institute this water is required in the wash basins, laboratories, toilets and outdoors for landscape. These sources reduce the load on municipal water supply.

The secondary sources of water supply after use turns into grey water (from kitchen, wash basins) and black water (from the toilets).

The water from the laboratories turns hazardous owing to the presence of numerous chemicals, this water can be treated through autoclave or any locally suitable measure and then led into storm water drain in case there is no centralized water treatment solution adopted at present. Below mentioned are the secondary sources of water supply available at present.

Bore well – There are **3 bore wells** available on the site. These are used as underground water facility with daily water being pumped for using submersible pumps. On a daily basis water is pumped from per well for usage depending on the need.

There is no water scarcity during summer season and the water management, sanitation and supply scheme is well maintained.

6.1.3 Sources of Tertiary water supply

The tertiary source of water is the additional source of water harvesting. It is undertaken by the premises to store water for multiple purposes. They refer to the additional activities which have been in practice on a consistent basis by the College.

Rainwater harvesting – It is done through the ground water recharging and upgrading the water quantity for bore well recharging. At present, there are 3 recharge bore wells as follows:

1. Behind Mechanical Building – 50,000 litres/ day
2. Behind Mechanical Building – 5,000 litres/ day
3. Near Canteen – Dry

The water gets recharged and water table is maintained well naturally. The areas of gardens, tracks do not have any kind of flooding and water is percolated on its own. Though, there can be provision of water tanks to store the water in future. At present the requirements are met within the limits.

6.2 Water requirement

The main areas of water requirement and type of usage is as follows

- **Drinking water** – Consumption of around 2,000 – 2,500 litres of water through Aquaguard like system available in the premise, the taps and water cooler.
- **Toilet blocks**– General usage by occupants in toilets, urinals, bathrooms, wash basins using approx. 15,000 litres of water daily
- **Cleaning of the premises** – The entire Institution is very well maintained with respect to hygiene and cleaning is one of the major uses of water requirement. The toilet areas are cleaned twice on a daily basis.
- **Garden and surrounding open space** – Cleaning, watering the plants requires approximately more than good amount of water, keeping in mind the scale of the open spaces there is supply system connected directly and the plants, trees are hardly watered regularly. The sprinkler system is practiced at present.

6.3 Areas of water usage

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

- Urinals – 30 Nos.
- Toilets – 113 Nos.
- Wash basins – 128 Nos.
- Taps (Indoors) – 247 Nos.
- Taps (Outdoors) – 3 Nos.

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

6.4 Site investigation about water management.

The College has an excellent management system which is very appreciable. We have observed the following points.

- There is **no water leakage in the entire premise**; the pipes are well maintained with adequate hygiene.
- **The premise has an efficient water management in terms of operations and maintenance.** The toilets are kept very tidy and are cleaned every day.
- The **waste water does not mix with ground water and gets directed to storm water drains.** There are sufficient numbers of taps in the premise.

6.5 Survey Results

Note about the review-rating survey

The Participants were asked to review (Though an online mode) the practice on a scale of 1-5 with scale components as follows:

- Scale 1 – Poor
- Scale 2 – Satisfactory
- Scale 3 – Good
- Scale 4 – Very good

➔ Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)

Rating for the views regarding the Water management practices adopted in College, following is the result received.

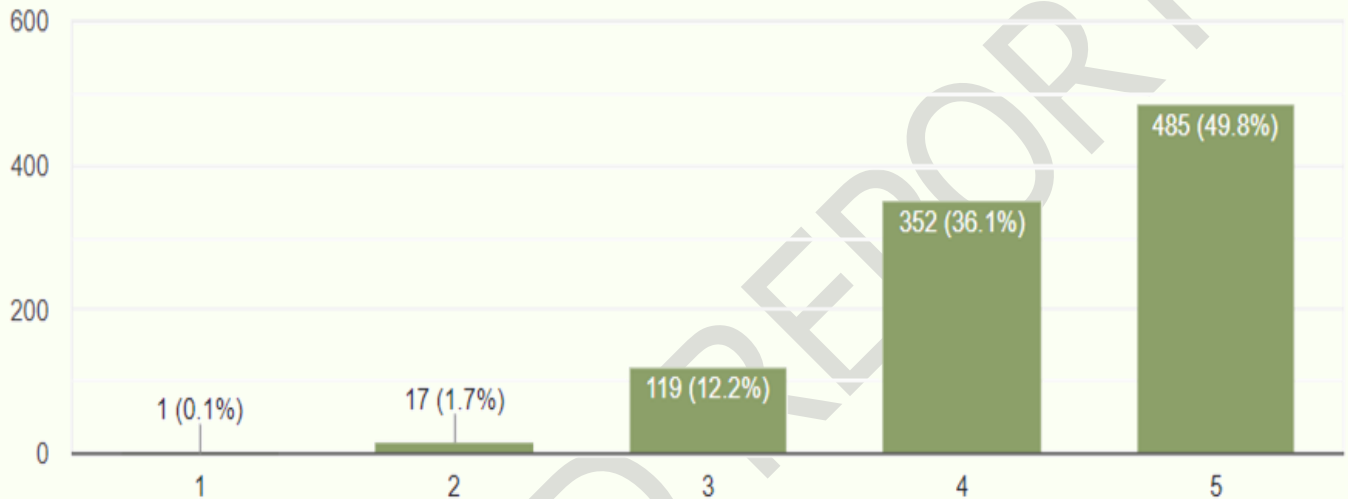


Figure 6: Water management practices in College

There were mixed responses received the highest was for **rating 5 (Excellent) at 50%** followed by **36% for rating 4 (Very good)**.

6.6 Recommendations related to section Water audit'

As per site verification for this audit the efforts of the College are highly appreciable as they are very well maintained for this section and thus there are **no recommendations suggested w.r.t this section.**

Health & Hygiene Audit



Background reference image Curology on unsplash

7. Health and Hygiene Audit

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

7.1 Facilities available

The Institution has the following facilities as part of the premise.

- Washroom facility in each of the Building.
- Hand wash facility on every floor.
- Drinking water facility in the form of Water coolers and taps which are kept clean.
- Ample number of dustbins in the premises (Indoors and the Outdoors).

7.2 Smoke Exposure

As per the Site visit the following analysis **has a positive impact on premises.**

- Canteen uses Gas cylinders for cooking; there is no utilisation of fire wood. Thus **there is no smoke from burning of fire wood and any health issues related to the same.**
- The **garbage in premises is not burnt**; thus there is no air pollution caused.
- **The Institution is a tobacco and smoke free campus which helps in adapting to a Healthy Institution.**
- There are parking provisions provided inside the premises but within the prescribed limits which is **balanced with the good vegetation in the premises.**

7.3 Hygiene

As per the Site visit the following analysis **has a positive impact on premises.**

- For overall hygiene of the students and staff there are facilities such as Washroom facility on ground floor, hand wash. The hygiene of toilet areas is well maintained. **The entire premises are cleaned twice on a daily basis. It is**

very appreciating that there are only few Maintenance staff who strive their best to take care of the entire premise in the most excellent way possible.

- The staffs keep a regular check about the operation and maintenance of the equipments each floor.
- Water management initiative with appropriate hygiene is undertaken. The areas of water tanks in site on ground floor are clean and no mosquito breeding spots are there.
- There are pest controls program practiced with appropriate sanitation facilities and Annual Maintenance Contract for pest control is done once a year by professional Pest control units.
- The food premises and equipments are cleaned as per schedule with special care taken to avoid any water stagnation. The food waste and other refuse are removed periodically from food handling areas to avoid accumulation.
- As part of Tree Plantation programme the initiative of **Swachh Bharat Abhiyan of Govt. of India** is undertaken during various occasions.
- There are appropriate storage areas which are well maintained.

7.4 On-site investigation

During the physical verification of the site, the following points were noted.

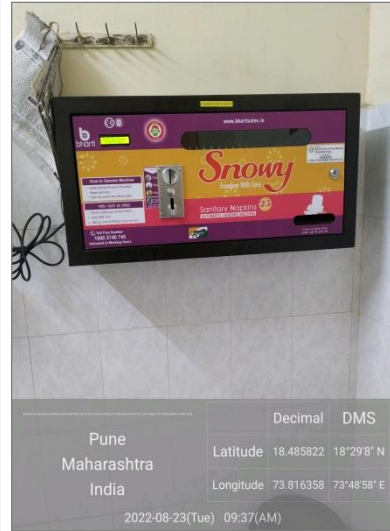
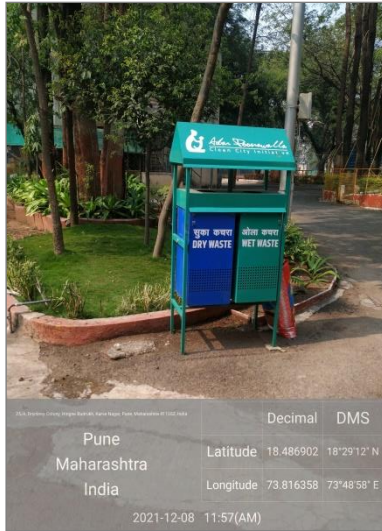
- All the facilities are cleaned on a daily basis.
- The Maintenance staffs are allotted the responsibility of the washroom hygiene and they do a very commendable and excellent job to maintain hygiene of the premises.

7.5 Recommendations related to section 'Health and Hygiene'

As per site verification for this audit the efforts of the College are highly appreciable as they are very well maintained for this section and thus there are no recommendations suggested w.r.t this section.

On-site investigation and physical verification

Facilities related to water and cleanliness, hygiene practices in the premises



8. 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.**

- ➔ **Signing of a MoU for improvement w.r.t. to Green Building aspects of premises** – The same was suggested before the visit and has been undertaken with immediate action.
- ➔ **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.
- ➔ **Carbon sequestration study** – This study will have to under taken in two phases; one for the dense forest in the premises and the second phase will be for all the plants in the premises.
- ➔ **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.
- ➔ **Net zero carbon reduction projects** – This is a pilot project where each student will plant at least 6 projects.

9. Towards a Healthy & Sustainable Institution

To be considered as **last priority** for implementation, once the section wise (first priority) and the consolidated study (second priority) recommendations are implemented.

The following recommendations are researched strategies for a Healthy and Sustainable Institution practices. These should be implemented within the next 3.5 years from the date of the Report submission.

- a) **Environment Certificate Courses** – The College could begin courses such as Bachelors, Diploma, or Certificate courses with National and International Collaboration related to Environment as part of the courses provided. Though, this is not a requirement or compulsion.
- b) **Terrace farming** - There can be the provision of terrace farming in a designated area of the open space this would enhance the biodiversity and be useful in training students and staff about the healthy practices and food grown which would be used in Canteen. It helps in smaller steps are taken have huge impacts when each student would adopt these practices in their homes or societies and grow kitchen garden, and terrace garden there will be a long term benefit for the environment as a whole.
- c) **Signages** – In addition to the signages being in regular language there can be additional signages in braille language for the specially-abled students.
- d) **Clubs** – There can be additional provisions for an Eco-club (For surrounding beautification projects); Hygiene club (For joint activities with local Municipal Corporation to undertake specific hygiene related activities in public areas); Nature/ Adventure club (For outdoor recreational activities); Non-teaching members club (For environment related activities). These are a few suggestions for the increased number of clubs in the Institute. Depending on the curriculum and extra-curricular activities appropriate steps can be undertaken.

10. 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.

➔ Local references

⇒ Climate data <https://en.climate-data.org/asia/india/maharashtra/pune-31/>

➔ National references

⇒ Uniform Plumbing Code – India, 2008

⇒ IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013

⇒ IGBC Green Landscape Rating system, March 2013

➔ International references

⇒ BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada

⇒ Used only for understanding Universal design - Universal Accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National center for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation and www.umassd.edu

⇒ The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States

⇒ Streetscape elements – Chapter 6 on San Francisco

⇒ American lung association <https://www.lung.org/>

⇒ Study related to air pollution <https://www.airgle.com/>

⇒ Exploring the light pollution <https://education.nationalgeographic.org/>

⇒ Accessibility study <https://www.washington.edu/>

⇒ Urban heat island effect <https://www.epa.gov/heatislands/what-you-can-do-reduce-heat-islands>

