

SUSTAINABILITY REPORT

2019-20 & 2020-21

AUDIT REPORT

Includes Environment, Energy and Green Audit

Studied for



Asian Academy of Education and Research's
Asian College of Science and Commerce

Sr. No. 28/15/16, Narhe Dhayri Road, Pari Company Chowk,
Tal- Haveli, Pune-411005

Analysed by



29 September 2021

Disclaimer

Green Audit Team has prepared this report for **Asian Academy of Education and Research's Asian College of Science and Commerce, Sr. No. 28/15/16, Narhe Dhayri Road, Pari Company Chowk, Tal- Haveli, Pune-411005** based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National Standards, the report has thereby been generated based on comparative analysis of the existing facilities and the benchmarks. The suggestions derived as a result of the inspection and research as per inputs which would further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

The audit is a thorough study based on the inventory and on-site investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm along with Ar. Nahida Shaikh as an Accredited Green Building Professional.

Greenvio Solutions

Developing Healthy and Sustainable Environments

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

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Acknowledgement

Green Audit Assessment Team thanks the **Asian Academy of Education and Research's Asian College of Science and Commerce, Pune** 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. Ms. Anita Sapte**, Founder President; **Hon. Mr. Anil Sapte**, Secretary; **Hon. Mr. Anand Sapte**, Vice President; **Hon. Mr. Madhav Dandawate**, Director and everyone from the Management.

Our heartfelt thanks to Principal and Chairman of the entire process **Dr. Shivaji M. Kakade**; Vice Principal and Internal Quality Assurance Cell (IQAC) Coordinator **Asst. Prof. Shruti Rege Madam**; Important Academic head **Asst. Prof. Latika Chame Madam** and **Prof. Shailendra Kane Sir, TPO** for the valuable inputs.

We are also thankful to College's Task force the faculty members who have collected data required for green audit **Asst. Prof. Aparna Kale, Asst. Prof. Swati Kale, Asst. Prof. Radhika Sathe** and **Asst. Prof. Anand Yadav** for the inventory and data collection.

We highly appreciate the assistance of **Mrs. Rupali Jagtap** and **Mrs. Gauri Tekale** for their support while collecting the data.

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

1. Introduction	4
2. Institution overview	8
3. Green Audit	14
4. Ecological (Environmental) Audit	15
5. Waste Audit.....	26
6. Water Audit	30
7. Energy Audit.....	34
8. Towards a Healthy & Sustainable Institution	53
9. References	54
10. Annexure.....	56

1. Introduction

1.1 About Asian Academy of Education & Research

AAER's Asian College of Science & Commerce has been established in the year 2009 under the aegis of the trust ASIAN ACADEMY OF EDUCATION RESEARCH PUNE which was founded in 2007 by a team of highly talented and experienced professionals which include technocrats, philanthropists, academicians consultants, legal luminary and personalities from sports and social welfare for the very purpose of giving opportunity to students especially from under privilege sectors. The motto of the founders was to develop students by providing excellent education along with developing them holistically to meet the expectation of industry, society and nation in the years to come. The college has been given permission by Government of Maharashtra on self-finance basis and is affiliated to Savitribai Phule Pune University (SPPU), Pune. In the years starting from 2009 the college has gained the reputation through its activities and is now running 7 programs under SPPU and is able to attract students.

Asian provides a brands new world class infrastructure and holistic environment for all over excellent learning and development. Asian has created a unique learning structure which has come to be the hall mark of the institute. The structure is outcome of the trustees and faculties experience as both members are in touch with changes and environment of industrial culture. Asian pride to mention itself as a student's oriented institute. Students are equipped to lead and win in their chosen field of work.

1.2 Vision and Mission Statement of College

Our Vision - To provide all the facilities and training to students to enable them to become good Managers, Entrepreneurs and Citizens.

Our Mission - Provide greater opportunities and access to higher education with equity to all the eligible students/persons and in particular to underprivileged sections there by contributing to the development of the society and nation.

1.3 Institutions in the premises

The Premises is situated amidst the landscape serene Taluka of Haveli with close proximity to the Western Ghats of Maharashtra and recreational amenities such Hospital, Fire Station and much more. During the entire day schedule there is smooth transition of internal student traffic management which is highly commendable.

There are 2 buildings in the same premises which are internally connected. First Building is the building of Science for Science Courses whereas Second Building is of Commerce & Management Courses. There are 2 different entry to the 2 buildings - First Building includes Ground Floor, 1st, 2nd Floor & 3rd Floor is the Terrace Hall whereas Second Building includes Ground Floor, 1st, 2nd Floor and 3rd Floor are the classroom for new courses.

It was established in 2009 with single building, over the time it has grown into an additional block in the pipeline and has undergone multiple expansion activities. The objective of college is to providing quality education to enhance employability skills through innovation and persistence.

The aim of the college is to continuously enhance the teaching methods in order to provide students with an opportunity for their all-round development. It also strives for excellence in academics and makes an effort to induce passion for learning along with the inspiration for decisive thinking and assessment, thereby helping them to become the best professionals in their chosen careers.

The institution offers the following courses affiliated to Savitribai Phule Pune University.

- Graduation : B.Com, B.B.A, B.B.A (I.B.), B.B.A (C.A.), B.Sc. , B.Sc. (Microbiology), B.Sc.(CS), B.Sc.(Animation), B.Sc.(Cyber & Digital Science), B.A.
- Post Graduation : M.Com., M.Sc.(C. A.), M.Sc.(C.S.), M.Sc.(Inorganic Chemistry), M.Sc.(Analytical Chemistry), M.Sc.(Electronics)
- Distance Education : B.Com., B.A., M.Com., M.A., M.B.A

Various Department in the institution are as follows:

- Department of Computer Science
- Department of Commerce
- Department of Science (Physics, Chemistry, Electronics, Botany, Zoology, Microbiology, Mathematics)

- Department of Library
- Department of National Service Scheme NSS
- Department of Physical education & Sports
- Department of Student Development Officer

The College aims at training young women and men to be competent, committed and compassionate, and lead in all walks of life.

1.4 Assessment of the College

University - The institution is affiliated to Savitribai Phule Pune University.

NAAC - The following are details of the Accreditation of the Asian Academy of Education and Research's Asian College of Science and Commerce.

- Cycle – First Cycle
- Grade – B+ Grade
- CGPA – 2.52
- Year of application – 2019

ISO – The College is ISO 9000:2015 (Quality Management System) Certified by SP Certification Limited, London in 2019-20

UGC – The Institute is recognised under UGC 2(F)

1.5 Achievements of the College

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

- **Best Under Graduate College in Maharashtra for teaching Excellence** by CEGR, Delhi (2021)
- **Global Achiever Award** by International UNICEF Council (2021)
- **ISO 9000:2015 (Quality Management System) Certified** by SP Certification Limited, London (2019-20)
- **Recognition as Swachhata Action Plan Institution** by Mahatma Gandhi National Council on Rural Education, Govt. of India (2019-20)

- **Member of National Rural Entrepreneurship Mission** by Mahatma Gandhi National Council on Rural Education, Govt. of India (2019-20)
- **Best College Award in Education as part of Rotary Professional Excellence Award** by Rotary Club Pune, Kothrud (2019)
- **Best college (Rural) as part of RID 3131's Professional Excellence Award** by Rotary Club of Pune, Kothrud (2019)
- Additional achievement in the field of **Innovation, Entrepreneurship and Startup** as follows:
 - IIC Establishment Certificate
 - Registered for ARIIA & NISP
 - Registered for MGNCRE



राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद
विश्वविद्यालय अनुदान आयोग का स्वायत्त संस्थान
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL
An Autonomous Institution of the University Grants Commission

Certificate of Accreditation

*The Executive Committee of the
National Assessment and Accreditation Council
on the recommendation of the duly appointed
Peer Team is pleased to declare the
Asian College of Science and Commerce
Pari Company Chowk, Tal. Haveli, Dist. Pune,
affiliated to Savitribai Phule Pune University, Maharashtra as
Accredited*

*with CGPA of 2.52 on seven point scale
at B⁺ grade
valid up to March 27, 2024*

Date : March 28, 2019

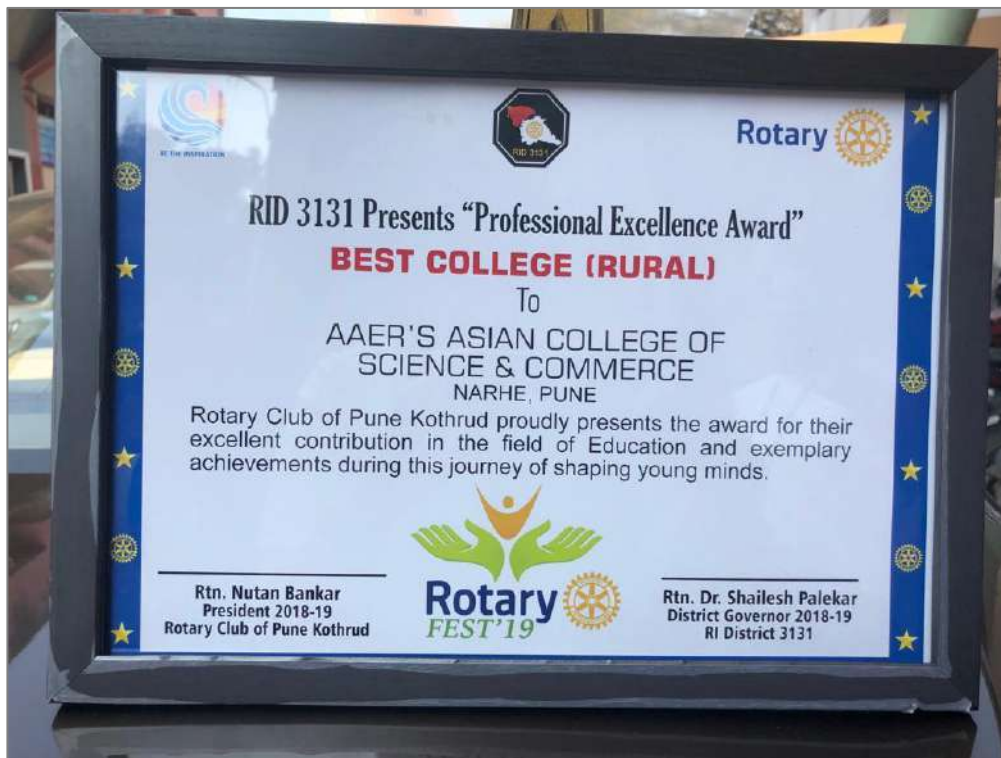


*S. C. Sharma
Director*

EC(SC)/37/A&A/MHCOGN102009

NAAC Accreditation Certificate

The various Awards received by Asian College



Best college (Rural) as part of RID 3131's Professional Excellence Award
by Rotary Club of Pune, Kothrud (2019)



Best Under Graduate College in Maharashtra for teaching Excellence
by CEGR, Delhi (2021)

The various Awards received by Asian College



Member of National Rural Entrepreneurship Mission
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by Mahatma Gandhi National Council on Rural Education, Govt. of India (2019-20)

The various Awards received by Asian College





CERTIFICATE

This is to certify that

Asian Academy of Education & Research Asian College of Science & Commerce, Pune

has established Institution Innovation Council(IIC) as per the norms of Innovation Cell,
Ministry of Education, Govt. of India during IIC Calendar year 2020-21

Prof. Anil D. Sahasrabudhe
Chairman, AICTE

Dr. Abhay Jere
CIO, MHRD,
Innovation Cell

Date : 2020-09-11

Certificate No : 4406

2. Institution overview

2.1 Populace analysis for Academic year 2020-21

2.1.1 Students data

The student data (shared by the College) shows in 2020-21 there are total of **1,252** students occupying the premises.

2.1.2 Department wise Student data for 2020-21

The following is detail study of student Data Department wise.

Type	Department	Nos.
Commerce		
Student	Sub-Department : B. Com / BBA / BBA (IB)/ BBA (CA) / M. Com FY + SY + TY	578
Teaching Staff	Commerce Dept. Teaching Staff	6
Non-Teaching Staff	NA	NA
Administrative Staff	Admin Cell	2
Science		
Student	Sub Departments : Computer Science B.Sc. (CS) / B.Sc. (PCME , PCBZ IE. Physics , Chemistry , Maths , Biology , Electronics / MSc. (CS) and MSc. (CA) ie MCA. FY SY TY	226
Teaching Staff	Science Department : Teaching staff	13
Non-Teaching Staff	NA	NA
Administrative Staff	Admin cell	2
Arts		
Student	BA (The First Batch is to be launched for 20-21)	NA
Teaching Staff	Teaching Staff : Arts	2
Non-Teaching Staff	NA	NA
Administrative Staff	Admin Cell	2
Placement and career counselling		
Student	NA	NA
Teaching Staff	Teaching	1
Non-Teaching Staff	Non-Teaching	1
Administrative Staff	Admin cell	1
National Service Scheme		
Student	100	100
Teaching Staff	5	5
Non-Teaching Staff	NA	NA
Administrative Staff	Admin Cell	5

Table 1: Department wise population study

2.1.3 College wise Student data for 2020-21

The following is detail study of student Data College wise.

Type	College	Nos.
Asian Junior College of Science, Commerce and Arts		
Student	Students of Junior College : 11th 12th from Science , Commerce & Arts and also from those who are appearing external Form No 17	448
Teaching Staff	Total Teaching staff (For Junior, for all subjects including languages like Hindi Sanskrit , German and others)	11
Non-Teaching Staff		14
Administrative Staff (Top Management)	7	7
Asian College of Science and Commerce (Senior)		
Student	Students of B.Com. / BBA / BBA (IB) / BBA(CA) / B.Sc. Regular/ B.Sc.(CS)/ /M.Sc.(CS) / M.Sc.(CA)	767
Teaching Staff	Total Teaching staff	19
Non-Teaching Staff	14	14
Administrative Staff (Top Management)	7	7
Asian Junior College of Science Commerce and Arts (Department - Distance Education)		
Student	12th Class (Form No 17th) Distance Education from all 3 streams : Science Commerce Arts	68
Teaching Staff	Teaching Staff :	9
Administrative Staff	Admin cell	1

Table 2: College wise population study

2.1.4 Staff data for 2020-21

The staff data shows the premise has a total of **43** staff members out of these there are **22** Teaching staff, **14** Non-teaching staff and **7** Administrative staff members in the premise.

2.2 Site analysis

The following listed are some of the positive site elements which are beneficial to the college in terms of tangible and intangible benefits.

- **Location** - The Asian Academy of Education and Research's Asian College of Science and Commerce, Sr. No. 28/15/16, Narhe Dhayri Road, Pari Company Chowk, Tal- Haveli, Pune-411005 and falls under the Pune Municipal Corporation.

- **Neighbourhood context** - The premise is surrounding by mix of Residential and Commercial (Small shops) on the immediate surroundings of the site. The premise is situated in Narhe, Pune.
- **Natural physical features** – Though situated amidst the urban centre, the college has made efforts to include plantation as part of its immediate site access.
- **Manmade features** – The premise is situated in an urban area with close proximity to all necessary amenities. The materials used for construction are RCC and the landscaping includes natural trees as well as potted plants.
- **Circulation** – There is a smooth transition of pedestrian traffic inside the premises due to the large entrance gate and the huge open space where vehicles of students and staff is parked.
- **Climate** – Pune has a tropical climate. In winter, there is much less rainfall in Pune than in summer. According to Köppen and Geiger, this climate is classified as Aw. The average annual temperature in Pune is 24.3 °C | 75.7 °F. The annual rainfall is 1200 mm | 47.2 inch.

(Source: <https://en.climate-data.org/asia/india/maharashtra/pune-31/>)

2.3 Total Institute Area & College Building Spread Area

The total site area is 0.93 acres (3,800 sq. m) and total built-up area is 35,000 sq. ft. for approx. 1,295 footfalls.

2.4 Institute Infrastructure

2.4.1 Establishment

The building was established in 1990. The Building is a Reinforced Cement Concrete (RCC) framework building. **Overall the Infrastructure of the Building is excellent in terms of the Architecture Design and Green Building Design. The Premise covers quite a few of the requirements for a Green Habitat.**

2.4.2 Spatial Organisation

The overall ambience of the College is warm and inviting. The classrooms and other

spaces have ample natural ventilation in the form of clear glass windows with fresh air ventilation. The architecture of the building is quite well designed. The colour palette not just helps the building to stand out but also provides an Institutional arena. It balances with the local architecture with the natural landscapes of huge coconut trees all around. The design emphasis on providing calmness to the built form and gradually merges with the serene landscape. The premise houses Junior and Degree College in one block and the other block is under construction.

There are no false ceilings in the campus. The floor to floor height is for Ground floor it is 5 meter, for the First floor it is 3.5 meter and for Second floor it is 3.5 meter. There are no lifts in the premise. There are provisions for CCTV in addition to amenities such as library. There are 2 meters for college buildings and. The room-wise details are mentioned below:

S. No	Room Name	Department	College	Floor
1	Office	Admin	Senior College & Junior College	Ground
2	Library	Library	Senior College & Junior College	Ground
3	Computer Science Lab	Computer Science	Senior College & Junior College	Ground
4	Conference Hall	Management	Senior College & Junior College	Ground
5	Principal	Management	Senior College & Junior College	Ground
6	Founder	Management	Senior College & Junior College	Ground
7	Wash Room Gents	Admin HR	Senior College & Junior College	Ground
8	Wash Room Ladies	Admin HR	Senior College & Junior College	Ground
9	Director	Management	Senior College & Junior College	1st
10	B. Sc Animation (Smart Room)	Science	Senior College	1st
11	Ladies Room	College Room	Senior College & Junior College	1st
12	Class Room	Science	Senior College & Junior College	1st
13	Class Room	Commerce	Senior College & Junior College	1st
14	Animation Studio	Science	Senior College & Junior College	1st
15	Department Of Commerce	Commerce	Senior College & Junior College	1st
16	Language Lab	Arts	Senior College & Junior College	1st
17	Computer Centre	Science	Senior College & Junior College	1st
18	Wash Room Gents	Admin HR	Senior College & Junior College	1st
19	Wash Room Ladies	Hygiene	Senior College & Junior College	1st
20	Skill Development Centre (Placement And Career Guidance Cell)	Placement And Career Counselling	Senior College	2nd
21	Class Room	Science	Senior College & Junior College	2nd

22	Class Room	Arts	Senior College & Junior College	2nd
23	Class Room	Commerce	Senior College & Junior College	2nd
24	Class Room	Science	Senior College & Junior College	2nd
25	Seminar Hall (B. Sc Cyber And Digital Science Proposed Lab)	Admin HR	Senior College	2nd
26	Department Of Chemistry	Admin HR	Senior College & Junior College	1st Floor Old
27	Electronics Lab (Class Room)	Science	Senior College & Junior College	1st Floor Old
28	Class Room	Department Of Chemistry	Senior College & Junior College	1st Floor Old
29	Inorganic Lab / Class Room	Department Of Chemistry	Senior College	1st Floor Old
30	Analytical Lab	Department Of Chemistry	Senior College	1st Floor Old
31	Chemistry Department Staff	Department Of Chemistry	Senior College & Junior College	1st Floor Old
32	Chemistry Department Staff	Department Of Chemistry	Senior College & Junior College	1st Floor Old
33	Senior / Junior Staff	Science	Senior College & Junior College	2nd Old
34	Class Room (Science)	Science	Senior College & Junior College	2nd Old
35	Department Of Zoology And Botany	Science	Senior College & Junior College	2nd (Old)
36	Microbiology Lab	Science	Senior College	2nd (Old)
37	Department of NSS And SWO (Student Welfare Room)	Department Of NSS And Student Welfare	Senior College & Junior College	2nd (Old)
38	Maths Room	Department Of Maths	Senior College & Junior College	2nd (Old)
39	Electronics / Physics Room	Electronics / Physics	Senior College & Junior College	2nd (Old)
40	Vivekananda1	Admin	Senior College & Junior College	3rd
41	Terrace Area	College	Senior College & Junior College	Top

Table 3: Room-wise space details

2.4.3 Fire Safety

When the building was constructed Fire fighting norms and permission from Chief Fire Officer was not in practice. However, the Institution has taken care for adequate fire safety measures to be adopted. Each floor has an open staircase without any barriers for fire safety measures. These staircases are free of any kind of storage or combustible material. The windows in each classroom are at a low height with fresh air and natural light thereby adding to ample ventilation throughout the day. The

college should adopt additional fire safety practices such as fire hydrant and others. The current facilities are quite well maintained. There are total of 6 fire extinguishers which have to be refilled/ renewed at the earliest.

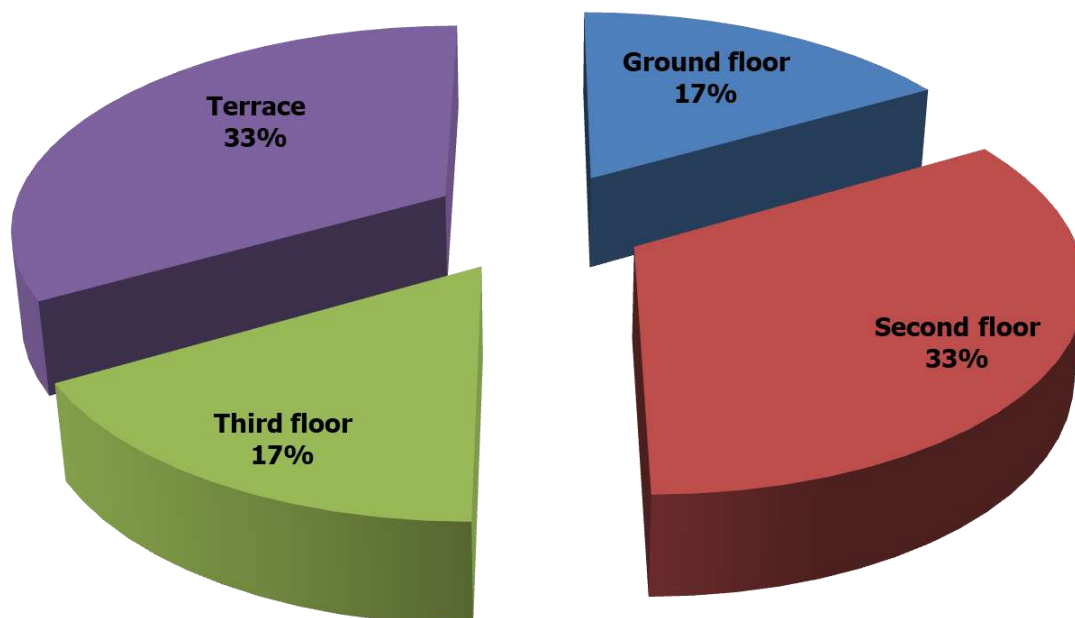


Figure 1: Summary of the fire-extinguishers in premises

All of the fire extinguishers are available in the Science department of Senior College and are available in the areas of Computer lab, Porch, Seminar Hall, Vivekananda Hall and Department of Zoology and Botany.

2.4.4 Operation and Maintenance of the premises

The interview session with the staff regarding the operation and working hours is summarised in the table. The Institutions are open Monday to Saturday for full day. Sunday is an off for all.

S. No.	Section	Spaces	Time	Hours / day	Days in a year
1	Main Institutional College	Student areas and Teaching faculty (Degree and Junior College)	7:30 a.m. to 1:30 p.m.	6	180
2	General areas	Admin areas and library, Passage, lift, staircase, toilet, Trust office, Outdoor Compound lights, Outdoor - Pumps	10:00 a.m. to 6 p.m.	8	225

Table 4: Schedule of the timings of the premises

3. Green Audit

3.1 About the Green Audit

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

3.2 Analysis for the Green 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 campus

Water Audit

- Analysis of the current water consumption of campus
- Scope to include Rain water harvesting and Waste water treatment in campus

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 campus
- Analysis of the flora and fauna of campus
- Strategies adopted at present to enhance vegetation
- Measures that can be adopted for ecological improvement of campus

3.3 Strategy adopted for conducting Green Audit

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

3.4 Timeline of the activities for Green Audit

- 29 May 2021 – Discussion with the College
- 29 May 2021 – Initiation by the College to conduct Audit
- 27 July 2021 – Data submitted by College
- 30 July 2021 – Live tour of the campus
- 9 August 2021 – Survey of the Student and staff submitted
- 17 August 2021 – Submission of draft Report
- 29 September 2021 – Submission of Main Report

The prestigious Institute of Asian Academy



Ecological (Environment) Audit



Background reference image Yugal Shrivastava on pexels

4. Ecological (Environmental) Audit

Environment is an essential part for human survival. We co-exist with the environment and it cannot be termed as a separate entity. The Ecological audit helps to understand the flora, fauna that exists and steps that can be taken to improve the same. To denote if there are problems related to sound in and around the surrounding. In terms of the carbon footprint it helps in keeping a tab on the eco-friendly habits incorporated by the inhabitants of the premise. Health today is the topmost priority, a general understanding of the initiatives undertaken along with sufficient hygiene practices adopted. Universal design is applicable to all built and unbuilt spaces. The premise needs to have facilities for students who are specially abled alike.

As part of our study we could state that the Institution has developed eco-friendly practices and sustainable solutions which are well reflected in the rich biodiversity of the Premises. Being situated near the city the appreciation space towards the main entrance provides a welcoming approach to the College.

4.1 Open Spaces

There is a small open space of around 300 sq. m. this is used by students at present for sports and some drone flying activities. Located amidst the urban area it is a large space and **the efforts to maintain the existing space are commendable.**

4.1 Flora Audit

4.1.1 Flora analysis

As informed by the staff there are few botanical plants are cultivated like Aloe vera , Neem, hibiscus but in the future college has plan to get the budget for botanical garden. The landscape area has a variety of plantations as follows:

A) Trees

The trees constitute a **total of 2 varieties amounting to 6 numbers** in premise. The list of trees is as follows:

S. No.	Name	Planted by	Location	Nos.
A1	Mango	Faculty and Students	Just near the Compound	1
A2	Neem		Near compound periphery	5

Table 5: List of Trees available in premise

B) Shrubs

The shrubs are among the highest contributors of all the varieties of plantations in premise and available in a **total of 3 varieties amounting to 25 numbers** in premise. The list of trees is as follows:

S. No.	Name	Planted by	Location	Nos.
C1	Rose	Faculty and Students	Near entrance gate	10
C2	Aloe vera		Garden	10
C3	Organic Grass Tea		Garden	5

Table 6: List of Shrubs available in premise

4.1.2 Green practices

We observed the following points during the Site investigation:

- The NSS Team and Admin staffs have joined hands towards the upgrading of the premises from environmental view.
- There are total of only few Maintenance staff who manages the entire campus.

4.1.3 Eco-friendly initiatives undertaken

The Institution has undertaken the following initiatives through **excellent efforts** towards save environment measures before pandemic. The NSS Department holds the nature club and various activities like tree plantation, nature cleanliness, visits to nearby flora and fauna are carried out.

4.2 Noise Audit

4.2.1 Macro level

On a macro level there are settlements close to the site. The approach road too has balanced traffic. As the college is oriented amidst the residential areas including close by Industrial areas thus there is some amount of noise from the surrounding areas.

Overall the noise level is moderate as per our analysis on macro level.

4.2.2 Micro level

The college has a minimal open space covered but it has hardscape paving which is not useful in keeping noise levels low. There is provision for staff parking which causes some noise. The college does not have generator and there is no sound

problem caused due to the same. There are no particular equipments which cause any effect. **Overall the noise levels inside the premises are between moderate and low which is a good approach.**

4.3 Carbon Footprint Audit

4.3.1 Eco-friendly Commuting Practices

Based on data collection and discussion with staff the following points were noted:

- **Ease of commuting** – Owing to close proximity to public transport the access is very feasible and walk able.
- **Parent's commute** - There are 2 Parent-teacher meetings held in a year and the turn-out is around 60%
- **Vehicles details** – The provision provided by College includes parking for 3 four-wheeler and 50 bikes bus parking but only 10 visitors vehicle parking is allowed at present.
- **Energy sources** – At present the LPG is not used instead the Induction stove is used hardly for an hour. Spirit is used in Chemistry labs. Half litres per day or even less.
- **Commute details** – The students commute from Dhayari , Khadakwasala , Kirkatwadi , Kolhe wadi , Narhe. The details of vehicles are summarised in tabular format below.

Total Number of vehicles used by stakeholders of College (per day) excluding parking provisions					
S. No.	Vehicles	Nos.	Average distance travelled	Approximate quantity of fuel	Amount used per day
1	Cycle	1	4	-	Rs. 10
2	Bike	25	6 km	1 litres	Rs. 100
3	Cars	3	8 km	2 litres	Rs. 200

Table 7: Vehicles usage by stakeholder of campus

4.3.2 Heat Island Reduction

The Institution has adopted the following practices which are yielding positive results in terms of Urban Heat Island Effect which refers to increase in temperature of the surrounding because of ineffective strategies.

Exposed roof areas – The terrace is flat roof some of the part is covered with solar panels.

Exposed non-roof hardscape areas - There is a pathway on all sides of the premises. These include some natural and potted plantations.

There are adequate measures adopted in the premises to reduce heat island effect of Building roofs.

4.3.3 No Outdoor Light Pollution

The college compound lights are not upward looking there not causing light pollution.

4.4 Health & Hygiene Audit

4.4.1 Smoke Exposure

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

- The college has No Smoking on its compound wall as part of the awareness.
- 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 campus is not burnt and there is not air pollution because of it.
- The Institution is a tobacco and smoke free campus which helps in adapting to a Healthy Institution
- There is parking provision inside the campus there is slight issue of dust owing to the same but it is balanced with the thick vegetation in the premise.

4.4.2 Hygiene

- For overall hygiene of the students and staff there are facilities such as Washroom facility on ground floor, napkin disposal, waterless urinals, hand wash, Sanitary vending machines, drinking water facility as Aquaguard.
- The hygiene of toilet areas is well maintained.
- **The entire campus is cleaned on 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.**

- There are designated Hygiene specialist and Maintenance staff who keep a regular check about the operation and maintenance of the toilet areas and the equipments, lights and all facilities on 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.

4.5 Universal Campus

As per World Report on Disability, 2011 there are 180 million approx. Persons with Disabilities that makes it 15% of total population of India.

There are Handrails along staircase and Universal toilet as part of universal campus initiatives. The design of the premises is appropriate for access with passages and corridors being moderate in size though it would have been better had they been bit wider and naturally ventilated at present there is artificially ventilation. The doubly loaded corridors are safe from fire safety as there are staircases and fire extinguishers provided. **There is a provision of ramp in premise.**

4.6 Survey Results

An online survey was conducted to analyse the student and staff views about the premise, following are some of the reviews.

4.6.1 Participation

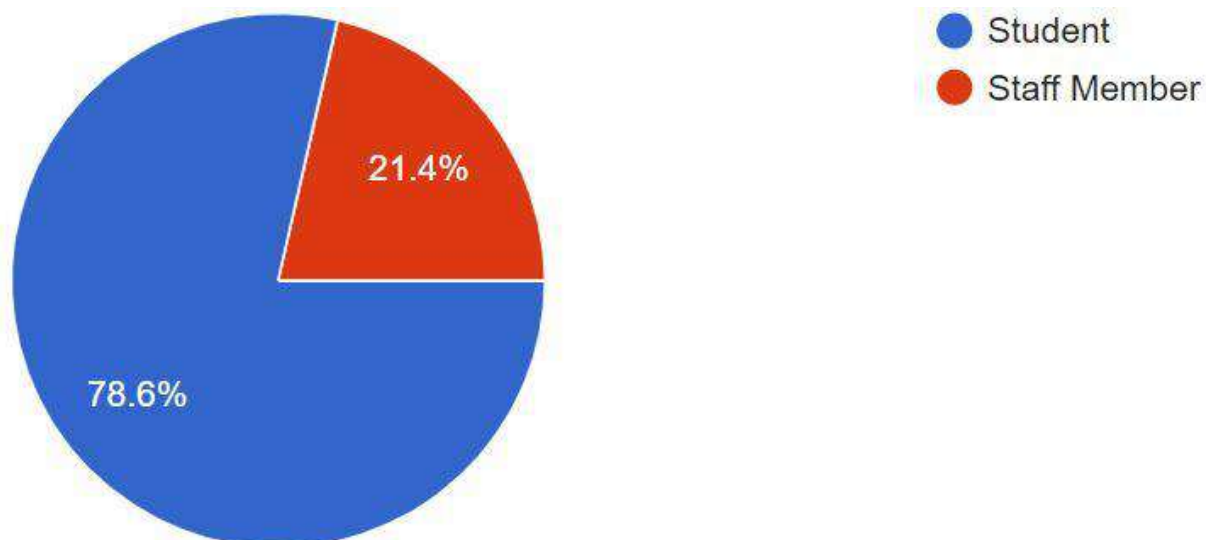


Figure 2: Participation analysis in the survey

A total of **112 responses** were received out of which 79% were students.

4.6.2 Rate the Green awareness practices in College

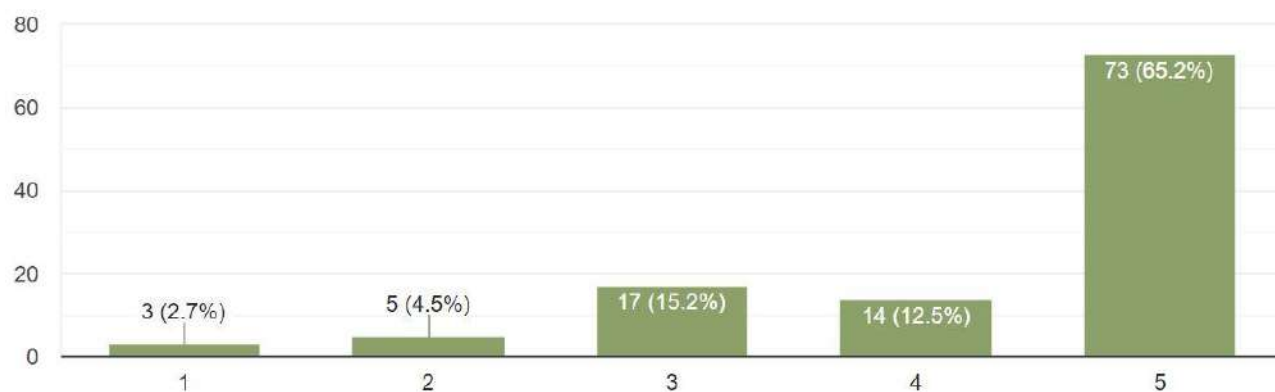


Figure 3: Green awareness practices in College

The students, staff (**almost 65%**) of responses found the practices to be excellent.

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

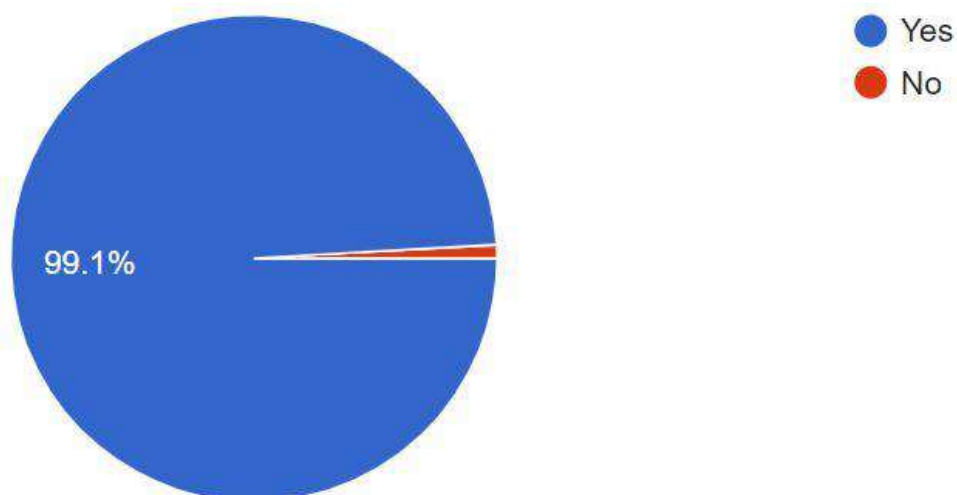


Figure 4: Green awareness practices in College

The students, staff (**almost 99%**) of responses confirmed activities are conducted which is very excellent.

4.6.4 Do you participate in such events?

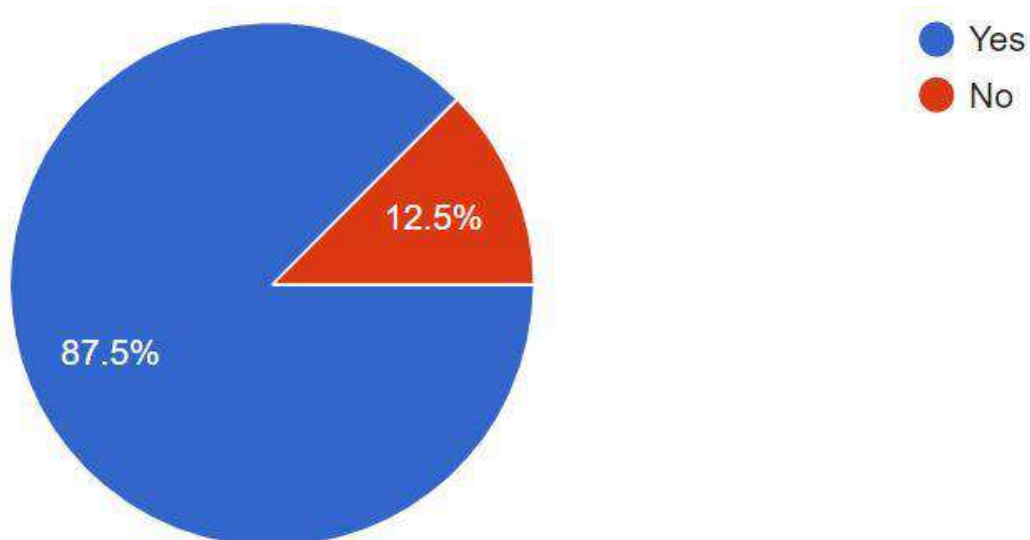


Figure 5: Green awareness practices in College

The students, staff (**almost 88%**) of the responses confirmed their participation.

4.6.5 If yes, what has been your experience about the program?

We have listed some of the key responses below.

- Really good to participate to know the importance of water harvesting.
- Excellent
- College is affiliated with SPPU and SPPU has EVS for all stream SY syllabus
- Each program conducted in very well manner
- Good
- The program was skilled & knowledge based.
- Very good
- Aspect of green movement
- Best person was invite they having excellent knowledge in their field
- Awareness in me is increased!! &team work improved !!
- Very energetic
- Very good
- It was good
- This program is very important and healthy life also and 1 years' experience is best to NSS camp
- It was very help full for environment
- "The experience for the Green program was very helpful and was one of the most important thing that we can do for our mother Nature .
- Very helpful & important things
- We had different sessions on environmental studies. It was helpful for maintaining greenery around our premises.
- The experience was simply amazing as the program conducted plantation of trees & plants at several places nearby college, and giving a short message on environmental awareness to other people.
- Gives positive impact
- I loved it
- This gives lots of happiness and positive energy from plants & nature.
- Excellent experience
- The program is very important inspiring ,motivating , and full of knowledge oriented
- Program experience is very good .
- Very Nice experience
- It was amazing
- Excellent programs done by our college
- It creates the awareness in our mind that, nature is our best friend...without nature our life is meaningless
- It's brilliant idea forever
- It was a good experience
- Interactive and learned a few informative insights from the organizers
- Very good & very helpful for me
- It gives information about awareness .
- Amazing program it helps to change the point of view of students
- Best experience
- Very informative

- It was informative and useful
- It was good. Learn many things. Came to know many people who are working in green industry.
- Yes , from last two years
- I participated in tree plantation event ,such a amazing event we pant 50+ plant near college area.
- We were taught new techniques about how to keep our environment pollution free and it was really an amazing experience
- Came to know about the cleanliness we should keep around our surroundings and society crowded area and also came to know about green revolution
- It is very nice and got to learn and do good things.
- I enjoy it with taking knowledge about that
- It is good conducting such programs spreading awareness . One must attend such programs. It was really helpful and nice.
- Very good experience, very energetic, satisfaction by doing something authentic.
- My experience was good as the college is involved in this activity.
- It's very educative.

4.6.6 What according to you are the positive steps taken by the Institute towards Green Building/ Good maintenance?

We have listed some of the key responses below.

- 1. Natural sun light usages. 2. Save energy Save water messages. 3. LED T12 T5 Tube Lights.
- 1. Segregation of wet and dry waste and 2. Workshops for environment conservation
- Natural sunlight, rain water harvesting, solar panel
- Being Environment Friendly
- We have to plant more trees
- Clean drive and Green drive
- Planting more & more tress in surrounding areas.
- 1. Minimising water use, 2.Using fewer more durable materials and generating less waste, 3.Avoiding the materials and chemicals that create harmful toxics emissions.
- 1) Usage of power saving mode and smart power saving tactics in computer labs and 2) Rainwater harvesting unit
- Tree plantation/botanical important herbs in college premises
- Using solar panel for light saving
- Max usage of natural sunlight to save electric energy
- Efficient use of energy, water and other resources
- Yes, It's neat and clean
- Planting more trees. All class room has proper ventilated using natural lights.
- Rain water harvesting , Maximum attention paid is to the hygiene
- Pollution and waste reduction measures, and the enabling of re-use and recycling
- Good indoor environmental air quality
- Waste disposal and smart Power saving modes
- Max uses of natural sunlight to save electric energy
- Help the environment project

- By organising seminars related to Environmental studies. We had geology and environment experts as lecturer, they gave us good knowledge
- Spreading awareness in students through seminars on environmental awareness & development.
- Hygiene maintaining
- Save water
- They have cleaned all the building and planted lots of plant in corridors as well as in free spaces
- College make students to responsible for plantation and keep clean environment.
- Various steps like tree plantation, conduct of environment awareness programs, etc.
- College do painting work, kept dustbin in a different places , do plantation program.
- Established benchmarks from a variety of sources show that you can reduce energy consumption by up to 20 percent with careful monitoring of asset performance using management software.
- According to me Organizing this program is the 1st positive thing
- Minimizing and categorizing waste products
- There are several steps taken by Institute
- By initiating webinar & and spread awareness
- Use of renewable energy, such as solar energy; Pollution and waste reduction measures, and the enabling of re-use and recycling
- Safeguarding water resources , Promoting health and wellbeing
- Our college is doing tree plantation regularly
- Install solar panels so that we can create renewable energy. There should be sufficient water in toilet and with proper management that it doesn't get wasted. We can plant trees on our college terrace. We can form a small layer grass on GI sheet (patra) of multipurpose hall because it will save our energy as in summer it gets really hot in there. This was something told by some lady who was creating awareness about waste management in our college.
- 1. To plant trees as many as possible. 2. Usage of public transport 3. Save excess use of water 4. Using renewable sources of energy
- Our Institute have planted many trees in the backyard and water is reused in our Institute
- Aware of Environmental issues
- Safe guarding water resources. Minimising waste and maximising reuse. Keeping environment green. Connecting communities and people
- Rain water harvesting, LED & power saving T5 T12 tubes & Tree plantation.
- Plantation done, very good cleanliness
- The premise of the college is clean i.e. daily cleaning in the classrooms and in the college surrounding is made.
- The regular demonstrations and presentations about Green Building awareness really gave us a lot of insights about the topic.

4.7 Recommendations for a Sustainable Habitat by Greenvio Solutions

a) Seating areas

There can be provision outdoor seating areas.

b) Promote the use of Eco-friendly vehicles

There can be provision for cycle and battery operated vehicles/ low emission vehicles such as electrically driven vehicles parking in open space along with battery charge points, this would inspire students to change mode of transportation and adopt sustainable practices.

c) Low VOC Paints and Adhesives

Whenever the College undergoes repairs or renovations there should be use of materials with low emissions so as to reduce the adverse health impacts on workmen and the students occupying the space thereafter.

d) Cool rooftops

It is suggested that the College gets the Terrace roofs painted with Cooltop as it will help reduce the temperature of the spaces.

e) Environmental awareness

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

f) Fire extinguishers

There should be at least 1 fire extinguisher in each space where there is an air-conditioner and also on the First floor.

g) Tree adoption scheme

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

Green practices adopted by College



Tree Plantation programme by College

Green practices adopted by College



Tree Plantation programme by College

Aspects of the Site for user benefit



Provision of Ramp, staircase with handrails and Garden spaces in the premise



Sanitary vending and disposal machine is made available in premise including water facility



Parking facility and open space in the premise

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 Premise

The types of waste collected in the campus are as follows, these are separated before processing and the local Corporation helps to collect the waste and then taken away.

S. No.	Type of waste	Bio-degradable	Non-biodegradable	Point of disposal	Separation of the waste
1	Solid	4 kg	3 kg	Outside campus in large size dustbins.	Yes Separate Dust Bins are there for separation
2	Liquid	2 Litre	1 Litre	Outside campus in large size dustbins.	Yes Separate Dust Bins are there for separation
3	Hazardous Waster	-	1 Litre	Septic Tanks	-
4	Dry leaves	0.5 kg	-	Outside campus in large size dustbins.	Yes Separate Dust Bins are there for separation
5	E-Waste	-	4 kg	Collection from the E-waste picker	Yes Separate Dust Bins are there for separation
6	Unused equipment	-	1 kg	Outside campus in large size dustbins.	Yes Separate Dust Bins are there for separation

Table 8: Summary of the types of waste produced in the premises

5.1.2 Bins summary

There are 44 Dustbins (provided with dry and wet waste segregation) in the premise. Out of these 40 are present inside the Institution with 10 dustbins per floor with volume of 80 litres each. The entire premise collects 20-25 kg of waste per week. The indoor –outdoor analysis of dustbins is presented below.

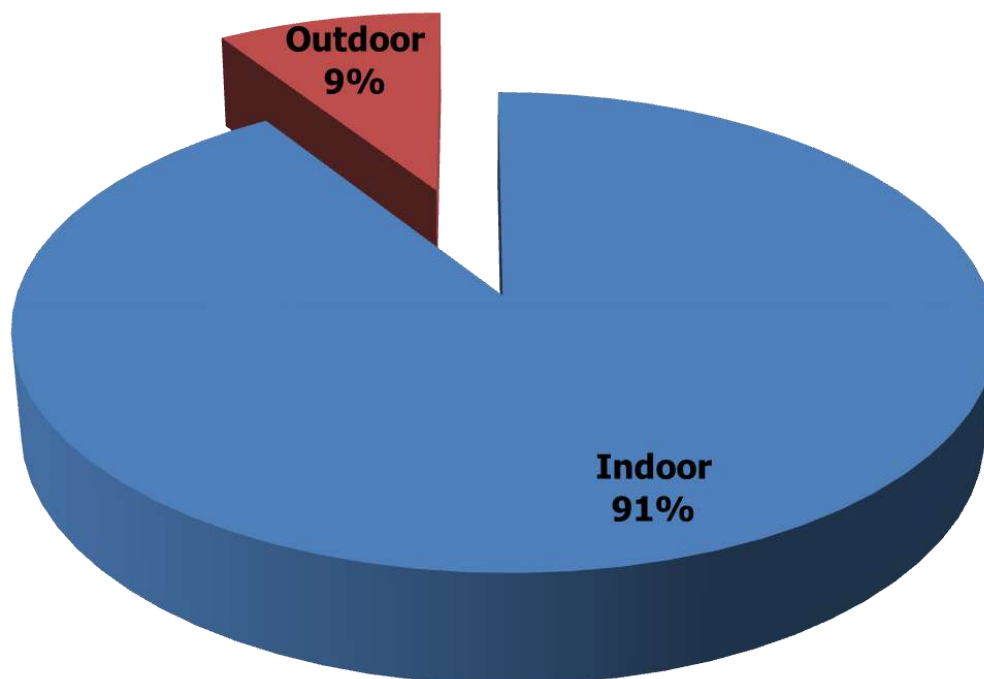


Figure 6: Analysis of dustbins in the premise

The above analysis shows the among the dustbins **91% are in the Indoor spaces** (On all floors, classrooms) and **9% in the outdoor spaces**.

5.2 Waste handling

Quantification wise as per Interview and survey it was found that the Solid, Dry leaves, E-Waste, Unused equipment and Medical waste collected is approximately 12.5 kg per week. The liquid and hazardous waste (septic tanks) is approximately 4 litres per week. The waste produced on campus is segregated. It is collected on a weekly basis and handed over to the local municipality van.

5.3 Waste management

The college reuses the papers. It was informed that after every 3 years the Paper waste such as journals, practical Reports were given in bulk to corporation for further processing. 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. There is provision for Sanitary Napkin Vending and Disposal Machine in the premise as one Incineration Unit in Ladies Wash Room for proper & hygienic disposal of sanitary napkins. There are signages in College mentioning awareness about cleanliness. The college practices waste wealth programmes and similar programmes. Students of Asian College of Science and Commerce under the National Service Scheme and Botany Department carried out 'Swachha Abhiyan' on the college premises. All the waste material collected is then given to Corporation and with their help is processed in nearby farms as Vermicompost. It's all done with the help of Pune Corporation.

5.4 Survey Results

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

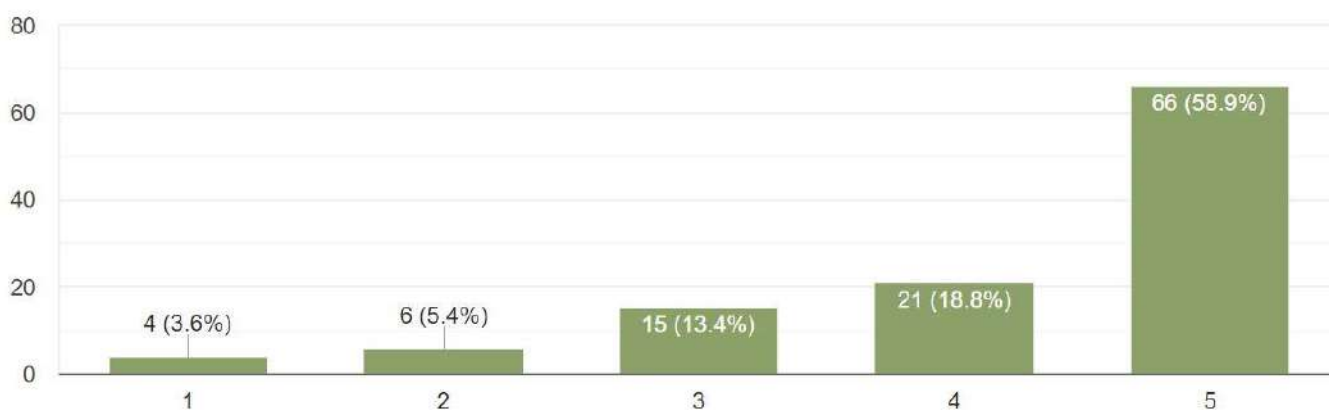


Figure 7: Waste management practices in College

The students, staff (**almost 59%**) of responses found the practices to be excellent.

5.5 Recommendations for a Sustainable Habitat

The following practice can be adopted for further up gradation.

a) Zero Waste

The college can undertake a zero organic waste protocol. The following practices can be adopted as part of the same.

- The food waste generated by the students and staffs are taken by them to their own home, so that, minimum waste is generated inside the premises.
- The organic waste generated in the canteen is used as feed for a biogas plant and the biogas is used as fuel in college canteen.
- Vegetable waste and other leaf litters can be used to fed in the vermi-compost pit and the resulting vermin-cast is used as manure in the garden.
- The chemicals from the laboratories be disposed in a sealed tank along with water, so that the chemicals undergo neutralization with the water.

As part of the above there will be a requirement for a Biogas plant, vermin-compost pit, awareness signages, sealed tank for waste water from chemical laboratory.

b) Organic Compost

As we have suggested in the Ecological Audit the provision for sustainable practices such as Kitchen garden and Terrace Garden there can be an organic compost pit in the open space in premises.

c) Incinerators

The Incinerators should be installed in Girls toilets for disposal of sanitary napkins

d) Twin Dual Litter Dustbin Bins

There should be more number of dual litter dustbins at various locations in areas such as Canteen, open spaces. This would inculcate the awareness of waste segregation among students.



Dustbins

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 main source of water is through well and Rain water harvesting. The College does not require water from the Local Municipality. The total water consumption through the tanks on site is as follows:

S. No.	Type of tank	Nos.	Location	Capacity in litres
1	Underground Tank	1	Near the entrance	30,000
2	Overhead tank	1	Terrace	6,000
3	Overhead tank	1	Terrace	4,000
Total				40,000

Table 9: Tanks in the premise

6.1.2 Sources of Secondary water supply

- a) Total 1 Bore well is available on the site as underground water facility with daily water being pumped for using submersible pump of 2 HP and 1HP pump each for 2 hours a day. The actual depth of the well near the playground is 30m and present depth is 20m. On a daily basis nearly 3,000 to 6,000 litres of water is pumped for usage depending on the need. The Rain water harvesting is done through the roof water being used for bore well recharging.
- b) Rainwater harvesting quantity details – The rainwater collected on terraces, roofs, balconies, and on grounds is smartly directed to the garden area and underground storage area. Also, rainwater is harvested by using simple techniques like using jars and pots. Through pipes, water is accumulated and restores in underground deep pits and tanks.

6.1.3 Water consumption through Aquaguard

There is provision for 1 Aquaguard which consume 35W for approximately 8 hours daily but is not in use since last 2 months. It is present on the Ground floor in Science Department and is used by both Senior and Junior College. Its capacity is 125 litres but the premise utilises 100 litres on daily basis. There is no water scarcity during summer season and the water management, sanitation and supply scheme is well maintained.

6.2 Water requirement

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

- **Drinking water** – General water required for drinking purpose using around 150 litres of water through Aquaguard available in the premise. The college gets in bulk the RO water cans from outside.
- **Toilet blocks and practical laboratories** – General usage by occupants in toilets, urinals, bathrooms, wash basins using approx. 250 litres of water daily and
- **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 thrice a day.**
- **Garden and surrounding open space** – Cleaning, watering the plants requires approximately more than 100-150 litres of water on alternate days in winter season and about 2-3 times a day in summer season on a regular climate day it is watered 3 days a week and in rainy season it is dependent on the monsoon showers.
- **Preparation of solutions in labs** – For experiment purpose in the Practical Laboratories water is utilised, however there is water wastage of about to a certain extent and currently this water is not treated and care is taken that it does not get mixed with the drain.

6.3 Areas of water usage

The following is a summary of the general water usage spaces - toilets, urinals, shower, flush tanks and wash basins/ taps in the premises.

S. No.	Floor	Lavatories			Taps			Flush tank (Single type)		
		Girls	Boys	Staff	Girls	Boys	Staff	Girls	Boys	Staff
1	Ground	2	1	1	8	6	6	2	2	2
2	First	4	1	1	14	14	6	2	2	2
3	Second				2					
4	Third	2	1	1	6	6	6	2	2	2
5	Terrace	2	1	1	6	6	6	2	2	2
Total		3	10	4	4	36	32	24	8	8

Table 10: Summary of the water consumption in the premises

Based on the inventory done and data shared by the staff it was found that the premise has a total of 18 lavatories (including urinals), 92 taps in toilets and 24 flush tanks.

As per the data shared by the College, it was noted that there is wastage of water to a certain extent in the form of Cleanliness of toilets and laboratories

6.4 Site investigation about water management.

- There was no water leakage in the entire premise, the pipes well maintained with adequate hygiene.
- The premise has an efficient water management in terms of operations and maintenance. The toilets were kept very tidy and are cleaned on alternate days.
- The lab water is given for neutralization to one of the near chemical unit. They process the water and remove any unwanted residue if any, **the waste water does not mix with ground water and gets directed to moist the soil for growing flowers**
- The college has rainwater harvesting system which is very useful.
- There is sufficient number of taps in the premise.
- Signages are included with information about avoiding water wastage near taps and wash basins.

6.5 Survey Results

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

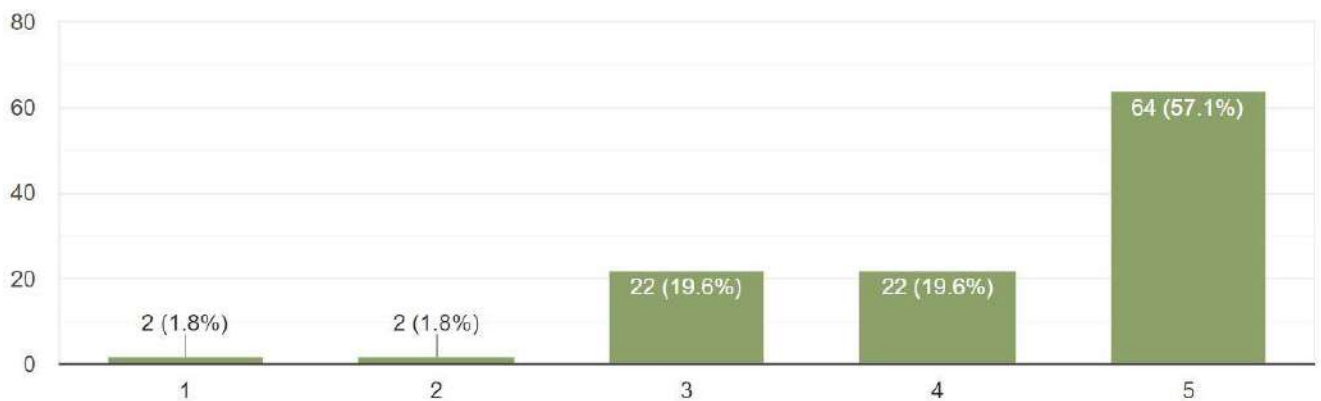


Figure 8: Water management practices in College

The students, staff (**almost 57%**) of the responses found the practices to be excellent.

6.6 Recommendations for a Sustainable Habitat

Below mentioned are few suggestions for better water management practices in the premise.

a) Universal Toilet

At least 1 toilet should be made for specially abled as per universal design norms.

b) Toilet flush system

Replace the existing single flush cisterns with dual flush, if possible to include waterless urinals or e-toilets.

c) Waste water from toilets

This should be collected and a waste water treatment plant can be installed in the open space wherein this water can be treated and reused for gardening and toilet flushing.

Site investigation and data collection



Save water signages outside toilets



Water cooler



Water storage tank on roof



Rainwater harvesting

Energy Audit

Background reference image Janko Ferlic on pexels

7. Energy Audit

7.1 Sources of Energy consumption

The premise uses following sources of energy consumption.

7.1.1 Primary sources

1. **Electrical (Metered)** – Light, Fans, AC, Equipments, Pumps consume approximately 1,085 units (Meter 1) and 705 units (Meter 2) per month for Rs. 1,086/- and Rs. 59/- per month (average).
2. **LPG** – There are 2 Gas cylinders used in the premise consume up to 38 kg of Gas per month for Rs. 800 /- per cylinder per month. But this is not applicable at present as the canteen is currently not used.
3. **Electric stove** – One Induction stove is used by the staff for around 1 hour per day it is connected to electrical consumption.

7.1.2 Secondary sources

1. **UPS** – There is 1 UPS in the premise for main admin Computer and for Exams room it is not working at present. The inverter is off and given for repair.
2. **Generator** – There is no fixed provision but as required it is hired on rent.

7.2 Site investigation analysis

The Site investigation observations and interviews with the Maintenance staff, Electrical department in charge are summarised below:

- The **switch-off drills are practised at present**, the inbuilt power saving mode in every Comp is functioning.
- There are **10 display boards encouraging staff and students to save energy are put up in the classrooms and laboratories.**
- There are **no Ultra-violet lights and any other harmful lights used** in the premise.
- Entire premise has **LED and T12 Tube Lights.**
- All class rooms and office is **ventilated using natural light.**
- **Smart monitors to save power.**

7.3 Actual Electrical Consumption as per Bills

The admin department had shared the bills for Meter and it is the main source of energy supply. The supplier is Maharashtra State Electricity Distribution Limited. The type of supply is **LT – Low Tension (073/LT VII (B) Public Service 0-20KW Oth)**. The details of unit consumption meter wise are as follows:

Month	Meter No. 05313237501	Meter No. 05313236996
May-20	904	10
Jun-20	3,646	96
Jul-20	607	82
Aug-20	1,153	77
Sep-20	717	108
Oct-20	834	73
Nov-20	738	65
Dec-20	841	45
Jan-21	819	56
Feb-21	799	44
Mar-21	1,739	31
Apr-21	1,133	28
Total	13,930	715

Table 11: Study of the electricity consumption of the meters in premise

The summary of the above study shows the average consumption varies for each of the meters.

7.4 Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff. The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, ac, equipment. In this the key energy is consumed by Motors used for AC which are considered in equipment analysis. The inventory and data collection for sources of energy consumed in the premise is summarised in the following sections.

Note: The following analysis is combined for entire premise taking into considerations the duration before pandemic to understand the consumption pattern as post pandemic the premise is used only for a few hours.

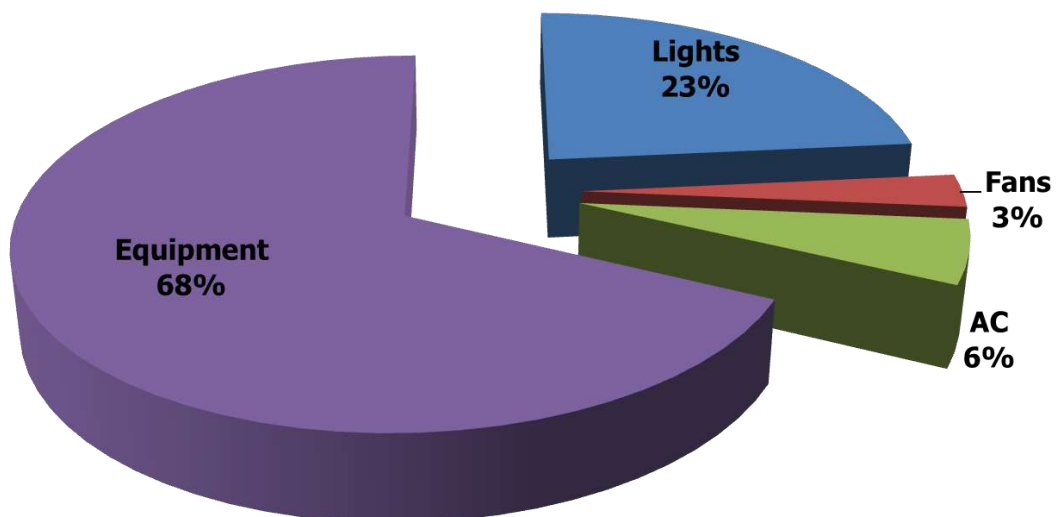


Figure 9: Summary of the Calculated Electrical Consumption as per inventory

The above graph shows that Equipment consumes 68% followed by Lights at 23% while AC consumes 6% and Fans consume 3% of the total calculated electrical energy.

7.5 Lights

7.5.1 Types of lights

There are a total of **129 lights in the premises**; the following table shows the various types of lights in the premises.

S. No.	Type	Nos.
1	T12 Lights	88
2	LED Tubelights	35
3	LED Floor lights	6
Total		129

Table 12: Summary of the types of Lights in premise

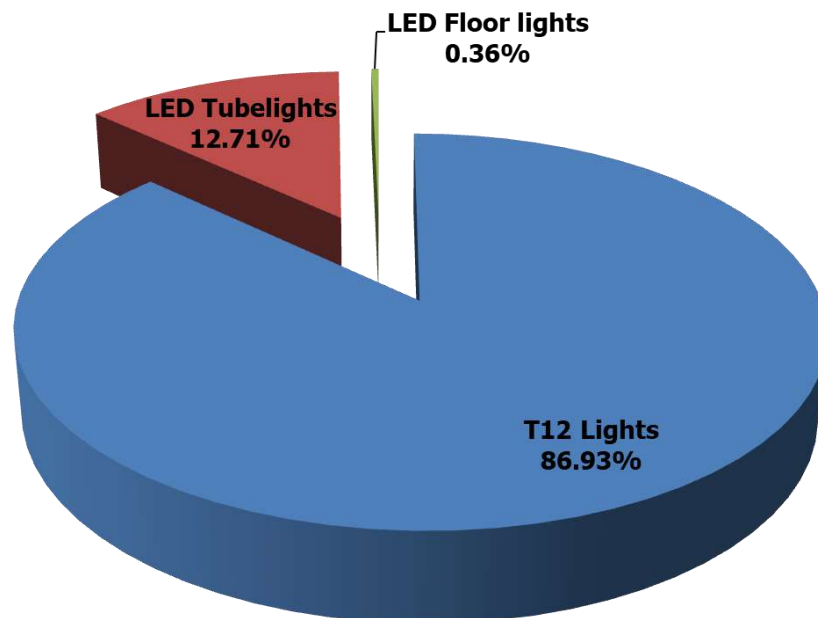


Figure 10: Types of Lights in the premise

The analysis of the types of lights in premises shows **T12 Tubelights consume 5,869 kWh at 86.93%** followed by **LED Tubelights consuming 858 kWh at 12.71%** and the **LED Floor lights consume 24 kWh at 0.36%**

7.5.2 Floor-wise consumption analysis

The energy consumption of Lights is **6,751 kWh** of energy; the following graph shows the floor wise consumption. This section analysis constitutes all buildings as a single entity.

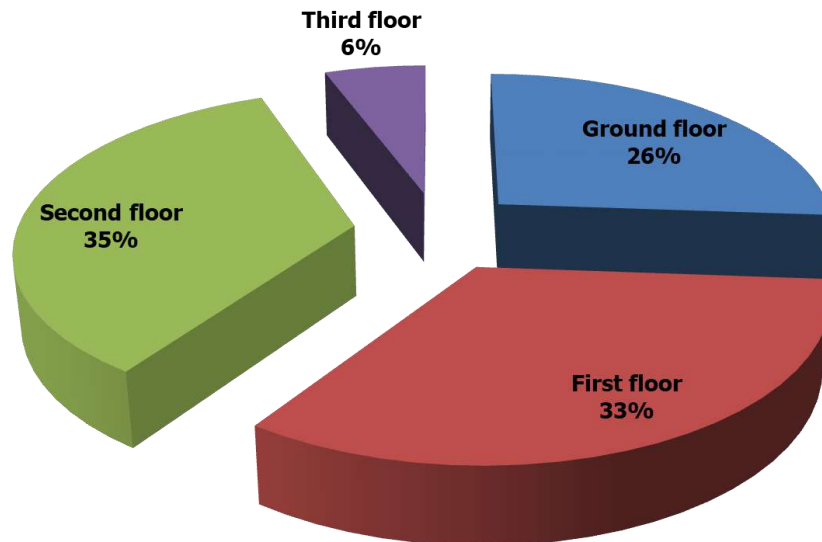


Figure 11: Energy consumed by Lights floor wise

The above analysis shows the lights in the **Second floor consume the highest amount of energy of 2,345 kWh at 35%** whereas the **First floor consumes 2,258 kWh at 33%** the **Ground floor consumes 1,764 kWh at 26%** and the **Third floor consumes 384 kWh at 6%**

7.5.3 Section-wise consumption analysis

The energy consumption of Lights is **6,751 kWh** of energy; the following graph shows the section wise consumption. This section analysis constitutes all buildings as a single entity.

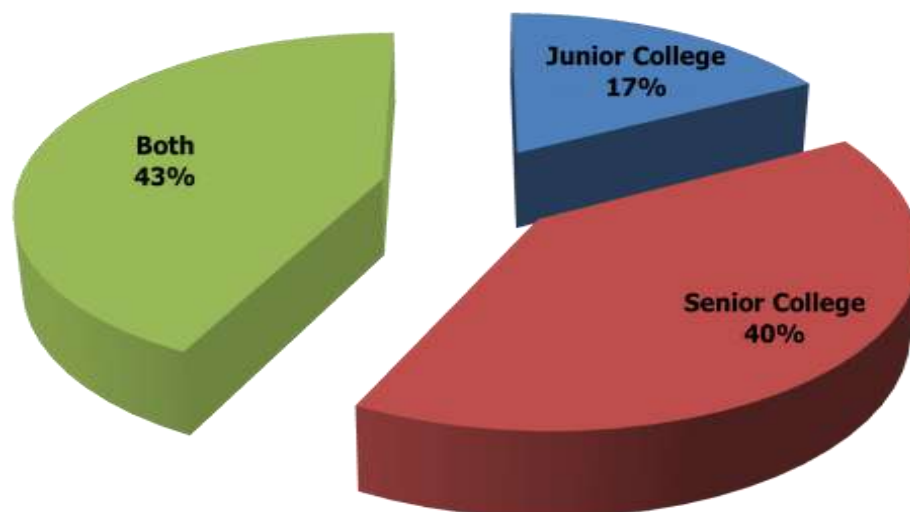


Figure 12: Energy consumed by Lights section wise

The above analysis shows the Lights in the **both college areas consume 2,882 kWh at 43%** and **Senior College consumes the highest amount of energy of 2,699 kWh at 40%** followed by **the Junior College of 1,170 kWh at 17%**

7.5.5 Requirement of NAAC

7.5.5.1 Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources – There are no solar panels available in premise at present. However there are plans to install these at the earliest.

7.5.5.2 Percentage of lighting power requirement met through LED bulbs

The premise has LED lights in form of Tubelights, floor lights and 13% of the lighting requirement is met through LED.

7.5.6 Site investigation observations

Some of the points noticed are as follows:

1. All of the lights are led
2. All lights are in working conditions
3. Daily monitoring and check is done by the maintenance staff.
4. There was no fuse defect observed.

7.6 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.

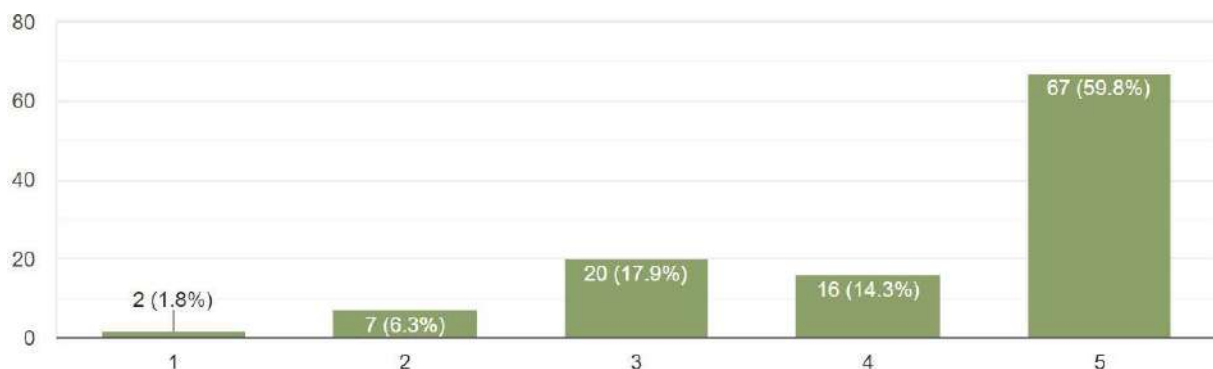


Figure 13: Energy Management practices in College

The students, staff (**almost 60%**) of the responses found the practices to be excellent.

7.7 Fans

7.7.1 Types of fans

There are a total of **103 fans** in the premise. The following table shows the various types of fans in the premises.

S. No.	Type	Nos.
1	Ceiling Fan	79
2	Table Fan	13
3	Wall Fan	8
4	Cooler	3
Total		103

Table 13: Summary of the types of fans in premise

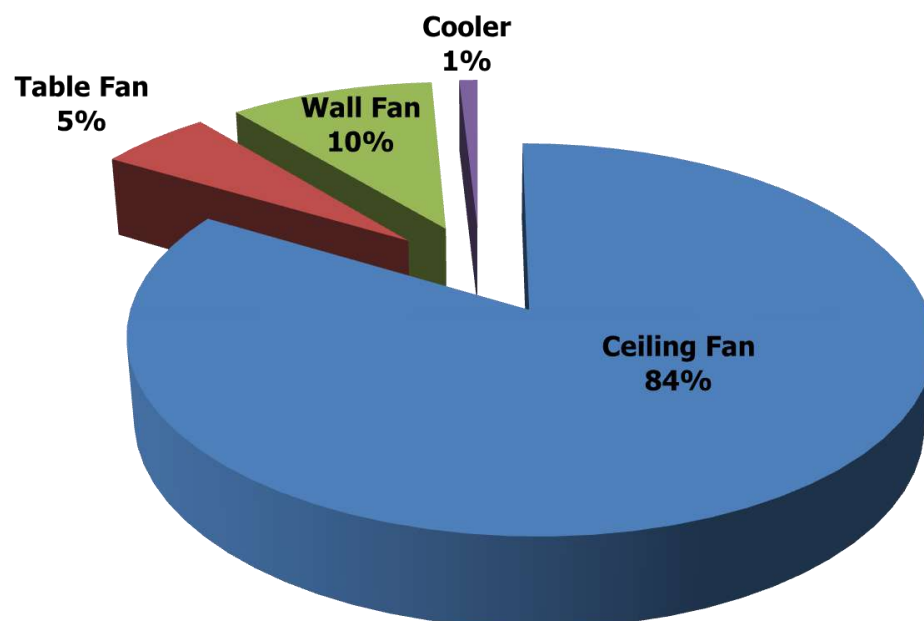


Figure 14: Types of Fans in the premise

The analysis of the types of fans in premises shows **Ceiling fans consume 698 kWh at 84%** while the **Wall fans consume 84 kWh at 10%** the **Table fans consume 46 kWh at 5%** and the **Water Cooler consumes 8 kWh at 1%**.

7.7.2 Floor-wise consumption analysis

The energy consumption of Fans is **835 kWh** of energy; the following graph shows the floor wise consumption. This section analysis constitutes all buildings as a single entity.

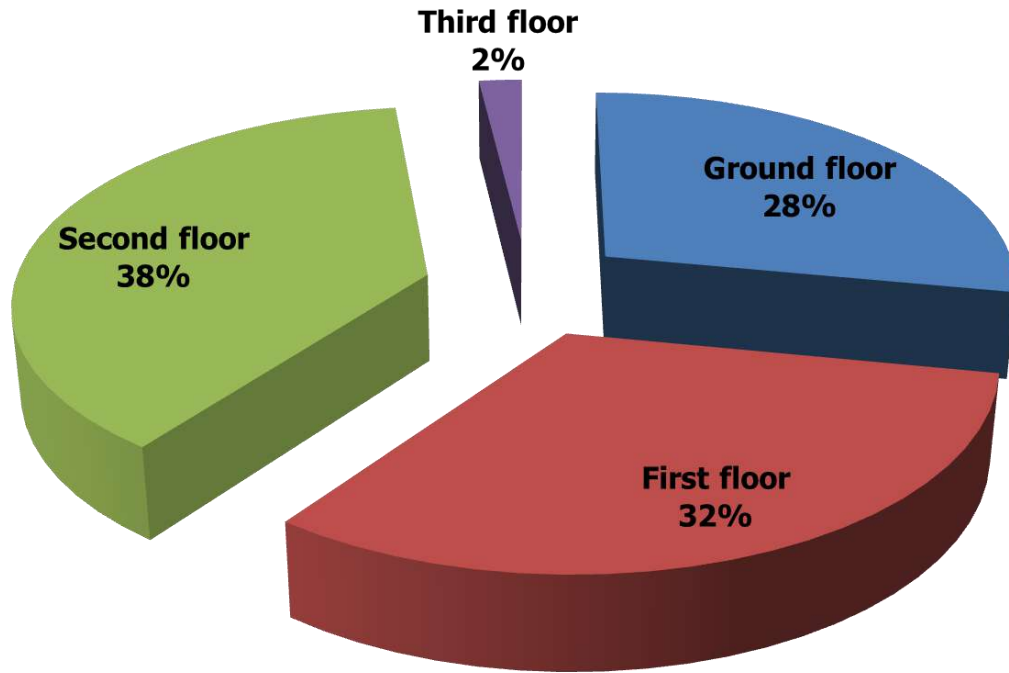


Figure 15: Energy consumed by Equipment floor wise

The above analysis shows the Fans in the **Second floor** consume the highest amount of energy of **317 kWh at 3%** followed by **the First floor** consumes **268 kWh at 32%** whereas the **Ground floor** consumes **234 kWh at 28%** and **Third floor** consumes **16 kWh at 2%**

7.7.3 Section-wise consumption analysis

The energy consumption of Fans is **835 kWh** of energy; the following graph shows the section wise consumption. This section analysis constitutes all buildings as a single entity.

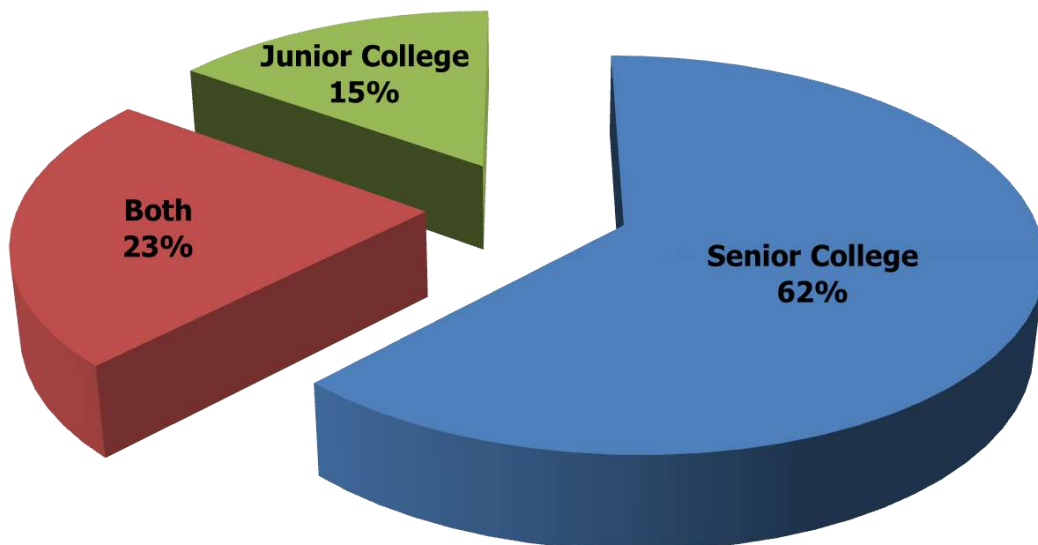


Figure 16: Energy consumed by Equipment section wise

The above analysis shows the Fans in the **Senior College consumes the highest amount of energy of 519 kWh at 62%** followed by **the areas used jointly by both colleges consuming 190kWh at 23%** and **Junior College consumes 126 kWh at 15%**

7.7.4 Site investigation observations

Some of the points noticed are as follows:

1. All fans are in working conditions
2. Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.

7.8 AC

7.8.1 Types of AC

There are **2 Air conditioners at 2 locations** in the indoors of the premise. Below mentioned is a summary of the AC in the premise.

S. No.	Room Name	Floor	Nos.	Tonnage	Make
A1	Founder Director	Ground floor	1	1.5	Lyold
A2	Presentation room	First floor	1	1	Godrej
Total			2		

Table 14: Details of the air-conditioners in premise

7.8.2 Floor-wise consumption analysis

The energy consumption of AC is **1,614 kWh** of energy; the following graph shows the floor wise consumption.

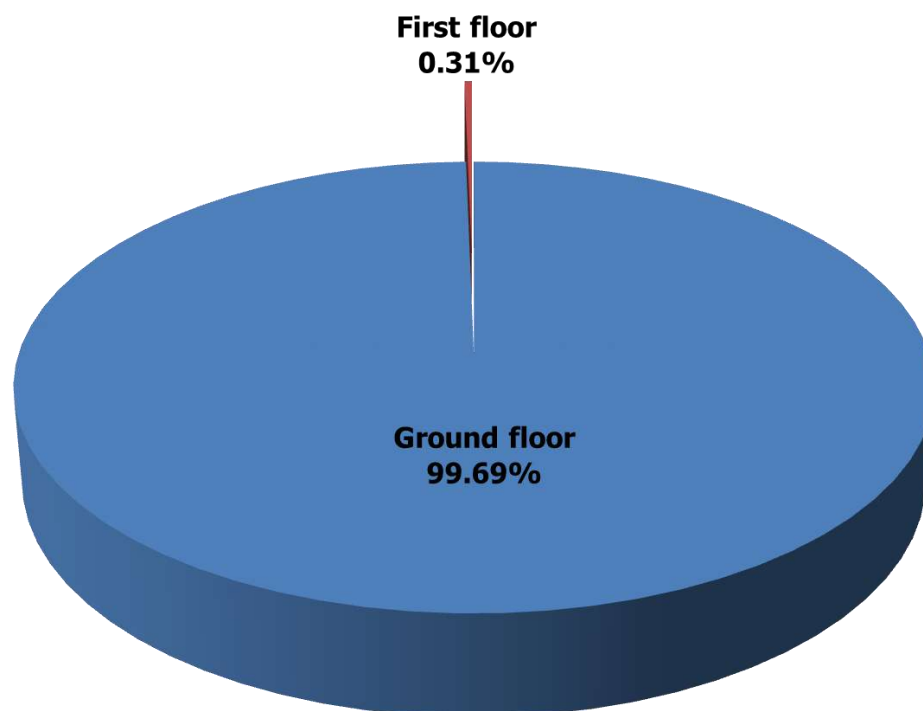


Figure 17: Energy consumed by AC floor wise

The above analysis shows the AC in the **Ground floor consumes the highest amount of energy of 1,609 kWh at 99%** whereas the First floor consumes **5 kWh at 0.31%** (Note – The AC on First floor is not in use at present and in regular days it is rarely used)

7.8.3 Site investigation observations

Some of the points noticed are as follows:

1. The AC are old and should be replaced.
2. Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.
3. The Outdoor Units are properly cleaned and maintained well.
4. The Outdoor Units do not have any dust collection problem.

7.9 Equipment

7.9.1 Types of Equipment

There are a total of **18 types of equipment totalling to 97 in number** in the premise. The various types are mentioned in the table below.

S. No.	Name	Nos.
S. No.	Name of the Equipment	Nos.
1	Computer	57
2	Printer	6
3	Projector	4
4	Speakers	7
5	Mike	6
6	D-link cable network router	1
7	TV LED 28 inch	1
8	Electrodmeeter	2
9	Potentiometer	2
10	Conductometer	2
11	Calorimetry	2
12	Spectrophotometer	1
13	Centrifuge	1
14	Dmere	1
15	CRO	1
16	Analog Digital Signal meter	1
17	Refrigerator	1
18	Practicals kits	1
Total		97

Table 15: Types of equipment in the premise

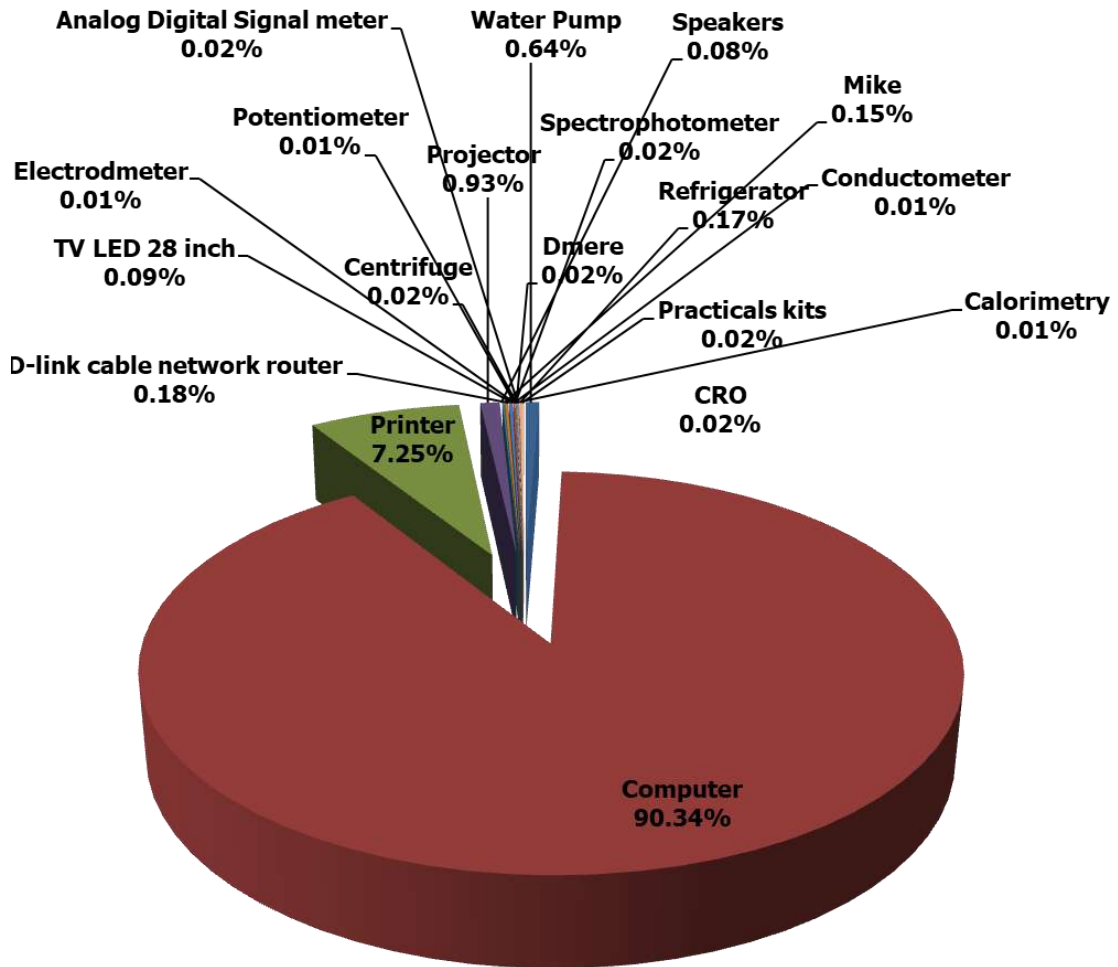


Figure 18: Summary of Energy consumed by Equipment

The above summary shows that **Computer consumes more energy at 90.34%** while **Printer at 7.25%** the **D-link cable network router consumes 0.18%** and the **Refrigerator consumes 0.17%** these are maximum consumers as compared to other equipment. UPS and Inverter (when used for electrical consumption else it is a battery backup and does not require electricity as an equipment) are also one of the equipment but are excluded in this calculation.

7.9.2 Floor-wise consumption analysis

The energy consumption of Equipment is **19,553 kWh** of energy; the following graph shows the floor wise consumption. This section analysis constitutes all buildings as a single entity.

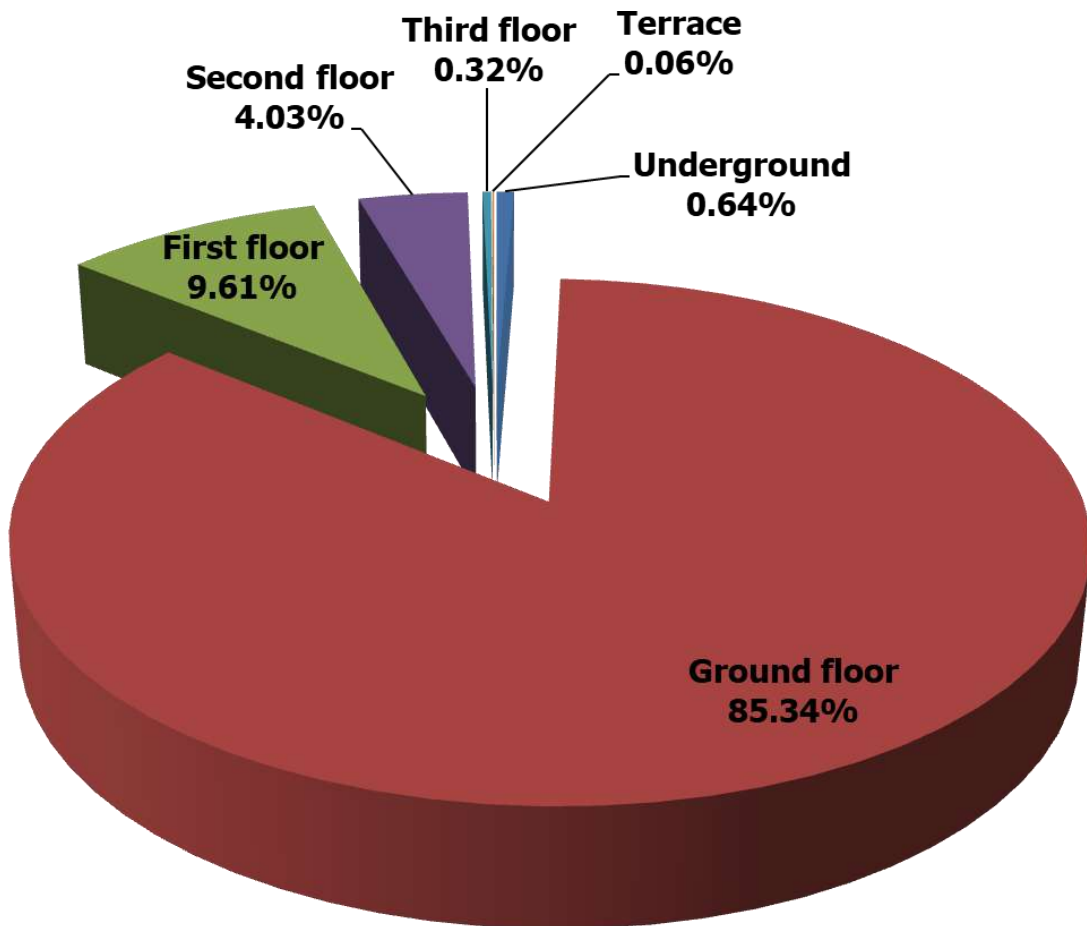


Figure 19: Energy consumed by Equipment floor wise

The above analysis shows the equipment in the **Ground floor consumes the highest amount of energy of 16,686 kWh at 85.34%** the **First floor consumes 1,880 kWh at 9.61%** whereas the **Second floor consumes 787 kWh at 4.03%** the **Underground (Usage of water pump) consumes 126 kWh at 0.64%** the **Third floor consumes 62 kWh at 0.32%** and least energy is consumed by **Terrace floor of 12 kWh at 0.06%**

7.9.3 Section-wise consumption analysis

The energy consumption of Equipment is **19,553 kWh** of energy; the following graph shows the section wise consumption. This section analysis constitutes all buildings as a single entity.

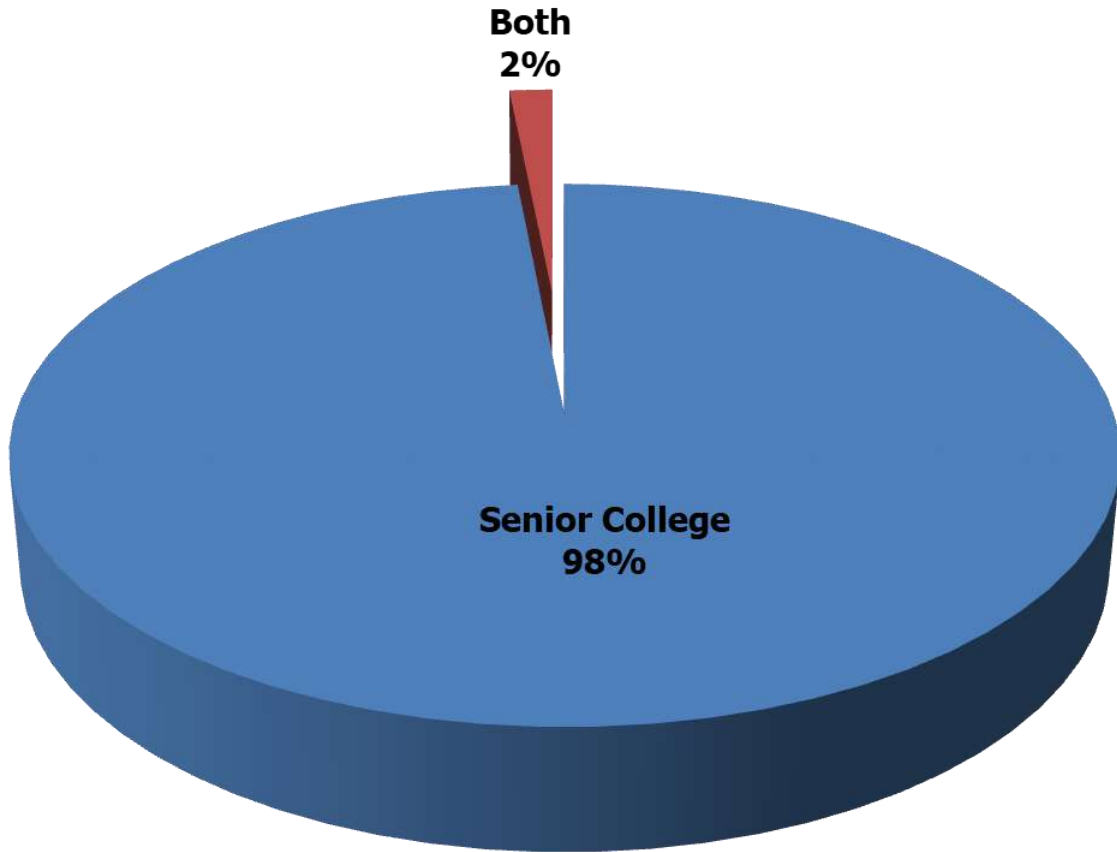


Figure 20: Energy consumed by Equipment section wise

The above analysis shows the equipment in the **Senior College consumes the highest amount of energy of 19,253 kWh at 98%** and the **energy consumed by Both that is spaces which jointly fall under both sections of Senior and Junior College of 300 kWh at 2%**

7.9.5 Site investigation observations

Some of the points noticed are as follows:

1. All Equipments are in working conditions and Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.
2. No defect was found in any equipment of electrical consumption.

7.10 Recommendations for a Sustainable Habitat

Over the time energy efficient appliances have been a boon not only to the energy saving parameters they adhere to but also the eco-friendly habits it helps to inculcate. The Institution such as Schools and Colleges are the best way to implement these initiatives. It creates awareness among the students at a young age. The Institutions also act as a symbol and representative of being an energy efficient premise.

Following the analysis we found are some of the suggestions which can be implemented for an energy efficient Institution. This would help in reduction of the current electrical consumption by a major percentage.

7.10.1 Lights

The current light analysis shows that LEDs (Tubelights and floor lights) occupy 41 nos. of the total lights in the premises. The remaining lights are T12 lights consuming 50W when in use and these should be replaced with LED lights which consume on an average 16-20W when in use.

The following graph shows a comparison of the current consumption and consumption of all **41 T12 lights on all floors** if replaced with LED lights.

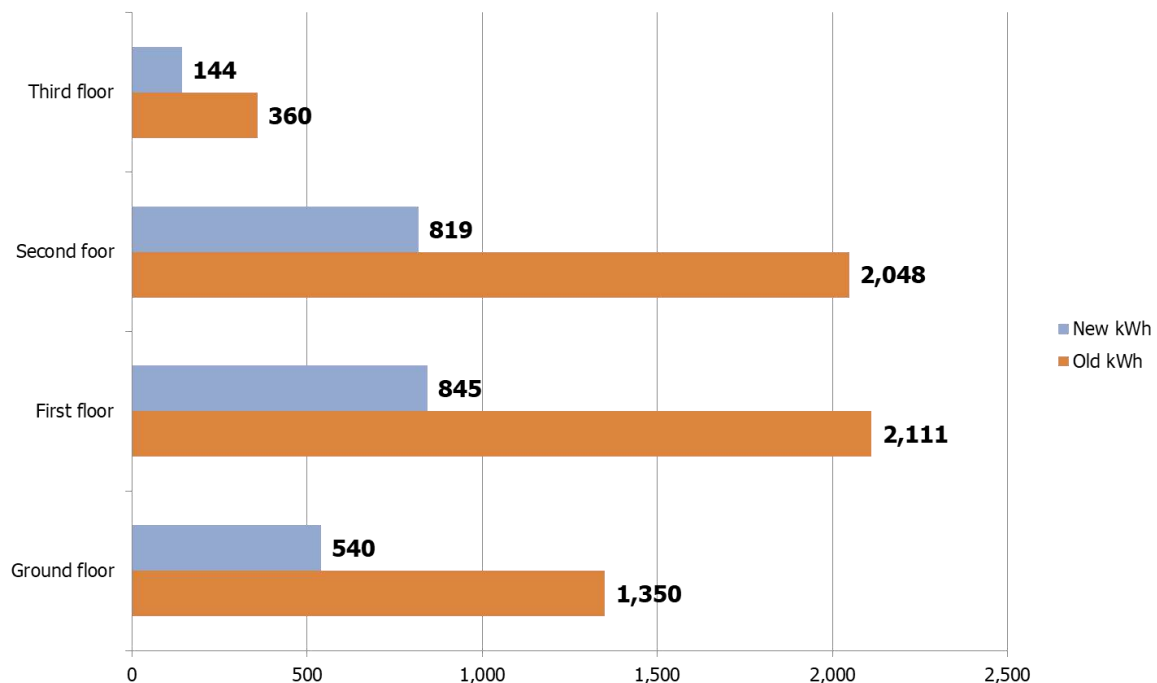


Figure 21: Analysis of current and new fans

The above analysis shows reduction of average of **40% reduction** in energy consumption if replaced with energy efficient appliance.

7.10.2 Fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 60W when in use. These should be replaced with energy efficient fans consuming 32W when in use.

The following graph shows a comparison of the current consumption and consumption of all **79 ceiling fans on all floors** if replaced with star rated appliance.

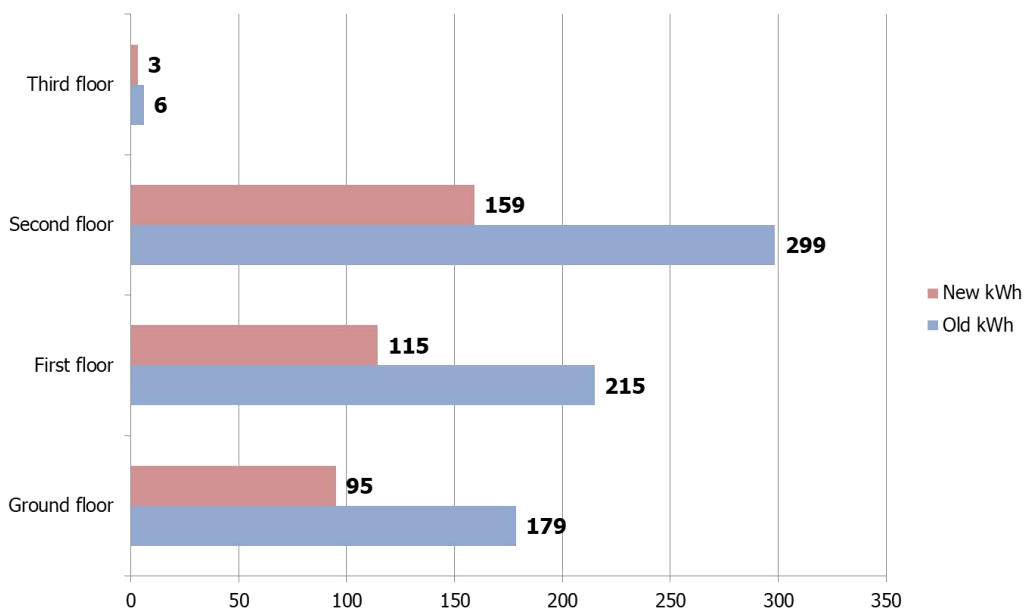


Figure 22: Analysis of current and new fans

The above analysis shows reduction of average of **53% reduction** in energy consumption if replaced with energy efficient appliance.

It will be suggested to either replace these now if College can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

7.10.3 AC

The current Air conditioners have become old. Most of these are not star rated and are consuming more energy. These should be replaced with energy efficient and star rated air conditioners wherein 1 ton consumes only 900W and 1.5 ton consumes 1495W.

The following graph shows a comparison of the current consumption and consumption of all the **2 air conditioners on ground and first floor** if replaced with star rated appliance.

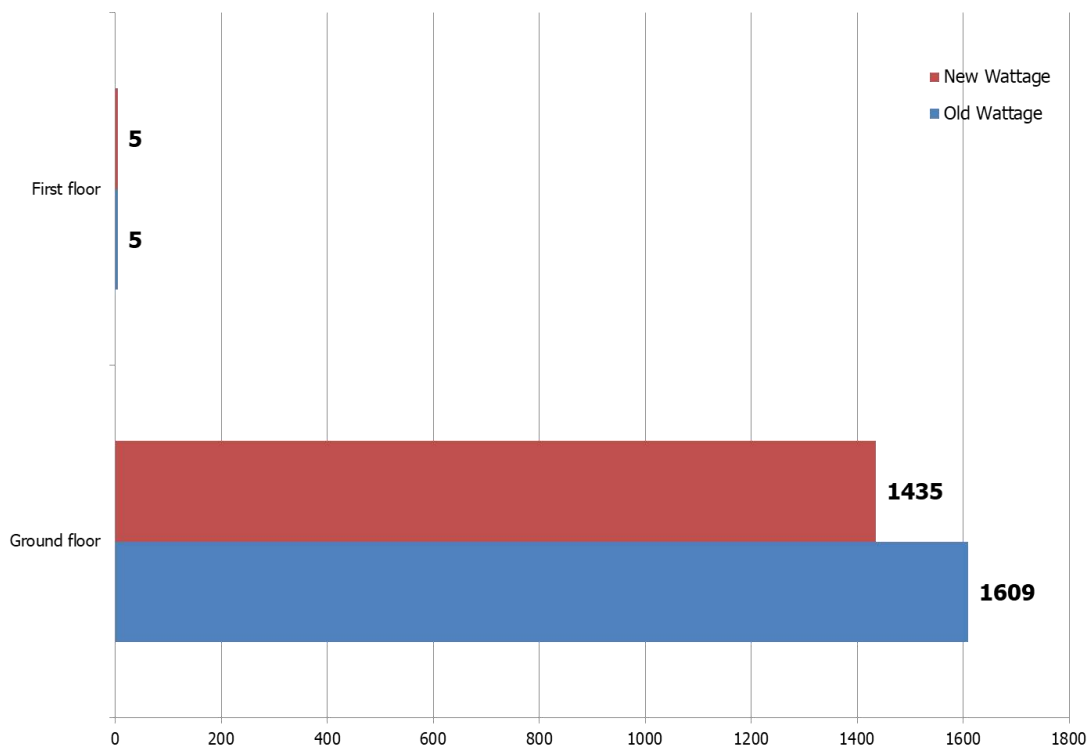


Figure 23: Analysis of current and new air conditioners

The above analysis shows reduction of average of **89% reduction** in energy consumption if replaced with energy efficient appliance on Ground floor, as the Air conditioner on First floor is hardly used there is no change in kWh consumption but it is better to be replaced.

It will be suggested to either replace these now if College can have certain plans else the replacement can be done when AC gets damaged or is not in working condition.

7.10.4 Equipment

Among all equipment the computers are in maximum number and suggested to be replaced with laptops as this would be energy efficient. A normal computer consumes on an average 250W and it is to be connected all time when it has to be used. On the contrary a laptop consumes 40W and has a battery backup which lasts upto 4 hours.

The following table shows a comparison of the current consumption and consumption of the **57 desktop computers** if replaced with laptops.

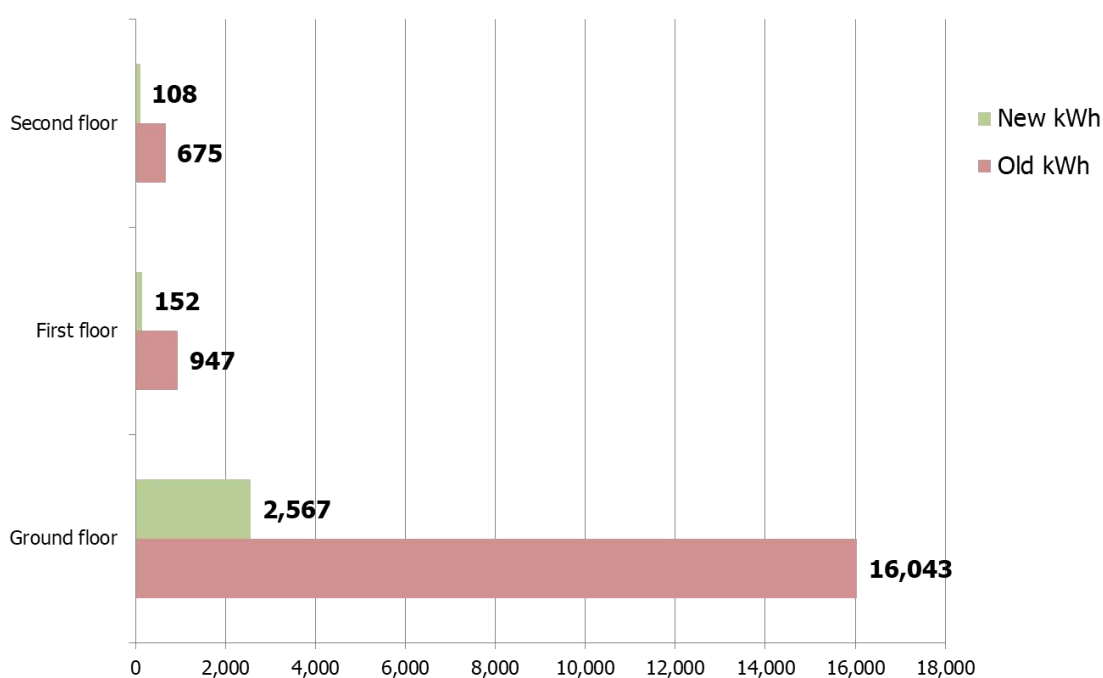


Figure 24: Analysis of current computers and new laptops

The above analysis shows reduction of average of **16% reduction** in energy consumption if replaced with energy efficient appliance.

It will be suggested to either replace these now if College can have certain plans else the replacement can be done when the devices get damaged or are not in working condition.

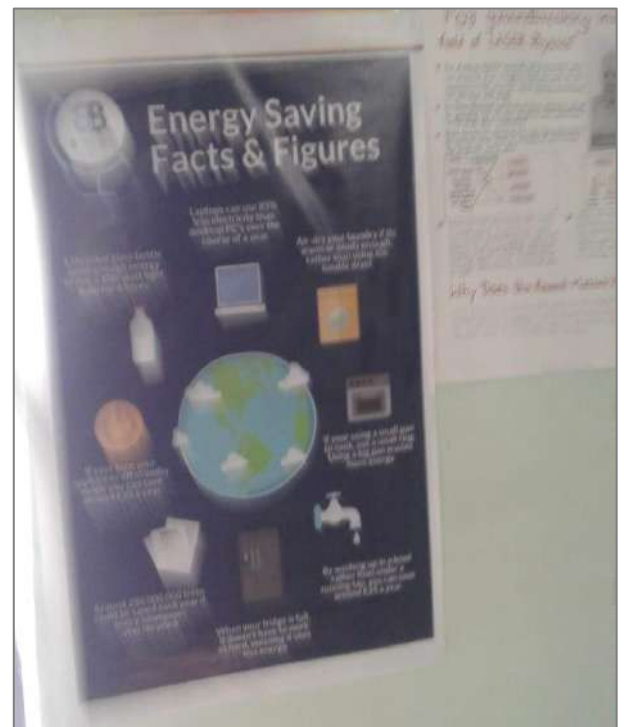
We would suggest installing a net metering device for better monitoring.

Site investigation and data collection



Energy consuming appliances in premise

Site investigation and data collection



Save energy signages at multiple rooms

8. Towards a Healthy & Sustainable Institution

8.1 Inputs by Greenvio Solutions

This is unique USP of College and will be added in Main Report.

Based on the analysis of the study of premises in addition to the recommendations provided in each section of Ecological, Water, Waste and Energy Audit the College can adopt the following strategies towards a Healthy and Sustainable Institution practices.

- a) **Terrace farming** - There can be provision of terrace farming alongside the Canteen on Terrace and kitchen garden practices 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 vegetables grown which would be used in Canteen. It helps in capacity building as well as the smaller steps taken have huge impacts when each student would adopt these practices in their homes or societies and grow kitchen garden, terrace garden there will be a long term benefit for the environment as a whole.
- b) **Cutlery in the Canteen** – The regular plastic and steel plates, spoons used in Canteen can be replaced with eco-friendly and organic leaves, paper straw, disposable plates, edible spoons and tables made out of sugarcane waste or bamboo. This will be first of its kind initiative to be adopted and practiced thus also inculcating the healthy practices in students.
- c) **Waste vio** – Stepping up a little further an initiative can be undertaken wherein College can tie up with an organisation and students can be encouraged to collect dry waste and electronic waste such as newspapers, old computers and others and hand over to organisation on a weekly or monthly basis thereby making a waste reduction approach in the community. This has benefits such as awareness, eco-friendly habits in becoming a responsible citizen.
- d) **Signages** – In addition to the signages being in regular language there can be additional signages in braille language for the specially abled students.

8.2 Survey Results

An online survey was conducted to analyse the student and staff views about what changes according to you can be undertaken for Green audit improvement in College premise and activity, some of the key responses are listed below. Whereas many responses **stated there were no changes requires because the present practices are excellent.**

- Vermicomposting can be done.
- Parking vehicle in separate place not near tress. Plant trees on terrace.
- Awareness about oxygen. More plantations of the plants which purify the air, like rubber plant, aloe vera & peace lily.
- By making awareness program related to recycling of plastic, domestic waste, tree plantation,
- Organise program to other colleges
- Dustbin should be there on every floor so students won't litter garbage around and the institute would be more clean
- Solar panels need to be there and smart automatic lights on and off
- Noise free environment promotion
- Enhancement of environmental ethics and values stewardship towards responsible environment management.

However, it should be noted that the College has taken up multiple initiatives and because of Pandemic the students have not practically visited the campus so many of these points are not mandatory at the moment.

9. References

1. Uniform Plumbing Code – India, 2008
2. IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
3. IGBC Green Landscape Rating system, March 2013
4. BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST - Canada
5. Climate data <https://en.climate-data.org/asia/india/maharashtra/pune-31/>
6. Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.

10. Annexure

Annexure – One of the Electricity bill

7/10/2021

HT/LTIP E-Bill



Maharashtra State Electricity Distribution Co. Ltd.

BILL OF SUPPLY FOR THE MONTH OF Sep 2020

000000949659225

GSTIN: 27AA ECM2933K1ZB

Website : www.mahadiscom.in

HSN CODE: 27160000

RASTAPETH (U) CIRCLE:519

PARVATI DIVISION : 310

WADGAON SUB-DN. : 677 1

Consumer No. : 170578756046
Consumer Name : SINDHU INDUSTRIES PROP DUDHALE
Address : SINDHUTAI GAJANAN
 S NO 28/15
 NR PARI COMPANY

Village : **Pincode :** 411041

BILL DATE	09-10-2020	4,660.00
DUE DATE	23-10-2020	
IF PAID UPTO	15-10-2020	4,650.00
IF PAID AFTER	23-10-2020	4,680.00
Last Receipt No./Date	/20-03-2020	
Last Month Payment	00.00	
Scale / Sector	Large Scale /Private Sector	

Email ID :		Activity :	
Mobile No. : 72*****34	Meter No.: 053-13236996	Seasonal : N	Load Shed Ind :
Tariff : 37 LT-V B I	Connected Load (KW): 20.00 HP	Urban/Rural Flag : U	Express Feeder Flag : N
Contract Demand (KVA): 15.00	50% of Con. Demand(KVA): 7.50	Feeder Voltage (KV): 11	LIS Indicator :
Sanctioned load (KW): 20.00			
DTC : 4677991	PC-MR-ROUTE-SEQ : 00-40-8861-9999	BU : 4677	PC : 00
Date of Connection : 15-01-2014	Category : LT Industry General upto 20 KW	GSTIN :	
Supply at : LT	Elec. Duty : 10	PAN :	
Prev. Highest (Mth) :	Prev. Highest Bill Demand (KVA) :		
Security Deposit Held Rs. : 15,000.00	Addl. S.D. Demanded Rs. : 00.00		
Bank Guarantee Rs. : 0.00	S.D. Arrears Rs. : 00.00		

BILLING HISTORY

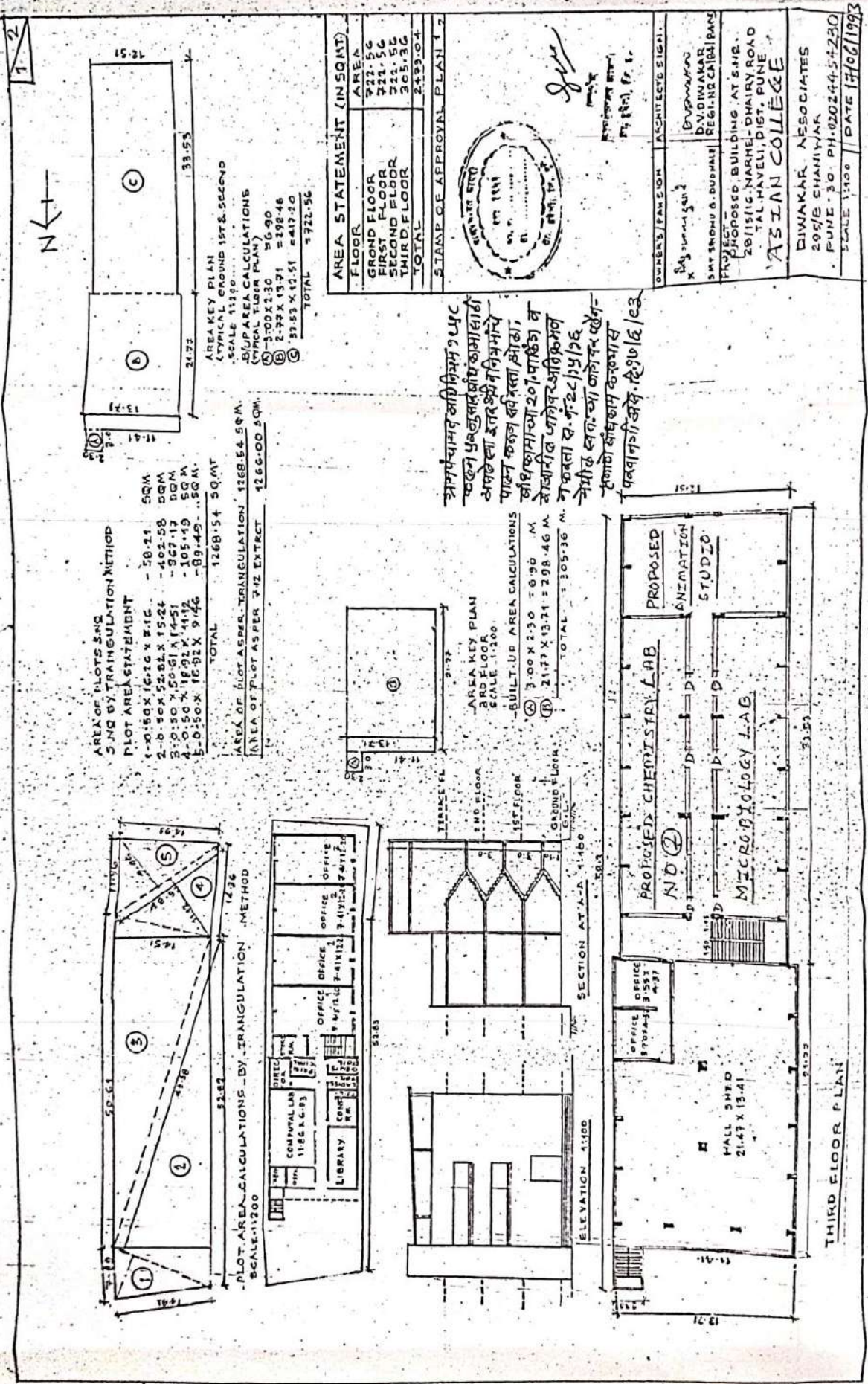
Bill Month	Consumption (Units)	Bill Demand (KVA)	Bill Amount
Aug 2020	77		01,609.66
Jul 2020	82		01,664.41
Jun 2020	96		0281.90
May 2020	10		074.69
Apr 2020	10		074.69
Mar 2020	36		0574.54
Feb 2020	54		0898.95
Jan 2020	148		01,606.95
Dec 2019	86		01,128.17
Nov 2019	82		01,098.12
Oct 2019	47		0822.31
Sep 2019	67		0955.40

CUSTOMER CARE Toll Free No.
1912, 1800-102-3435,
1800-233-3435

Rule & Procedure for Consumer Grievances Redressal is available at www.mahadiscom.in>consumer portal>CGRF Instead of Printed bill , register for E-bill and avail Rs. 10 per bill as a "Go-green " discount.For registration visit at www.mahadiscom.in->consumer portal->Quick access->Go-green request

For making Energy Bill Payment through RTGS/NEFT mode, use following details

- Beneficiary Name: **MSEDCL**
- Beneficiary Account Number:**MSEDCL01170578756046**
- IFS Code: **SBIN0008965**
- Name of Bank: **STATE BANK OF INDIA**
- Name of Branch: **IFB BKC**
- Bill Amount:**4,660.00**



AREA OF PLOTS SQM
BY TRIANGULATION METHOD
SCALE: 1:200

PLOT AREA STATEMENT

1	0.50 X 22.20 X 5.12	-	50.21	SQM
2	0.50 X 22.82 X 15.24	-	140.58	SQM
3	0.50 X 20.61 X 14.51	-	90.71	SQM
4	0.50 X 18.92 X 14.12	-	80.19	SQM
5	0.50 X 12.92 X 9.46	-	89.45	SQM
TOTAL		1268.54	594.15	

AREA OF PLOT AS PER TRIANGULATION 1268.54 SQM.
AREA OF LOT AS PER 7.12 EXTRACT 1268.00 SQM.

AREA KEY PLAN
(TYPICAL GROUND 1ST & 2ND FLOOR)
SCALE: 1:100

BUILT-UP AREA CALCULATIONS
(TYPICAL FLOOR PLAN)

(A)	3.00 X 2.30	=	6.90	SQM
(B)	21.77 X 13.21	=	288.46	SQM
(C)	37.53 X 10.51	=	394.20	SQM
TOTAL		=	722.56	SQM

AREA KEY PLAN
3RD FLOOR
SCALE: 1:200

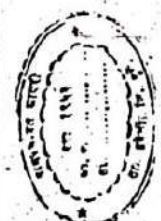
BUILT-UP AREA CALCULATIONS

(A)	3.00 X 2.30	=	6.90	M
(B)	21.77 X 13.21	=	288.46	M
TOTAL		=	305.36	M

આમ પંચાયત કાર્યાલય 3 માળ
કક્કમી બુલ્ડિંગ બંધ કરામાં હોઈ
અમુકે વ્યાજવહીલ નો નિયમ મુજબ
પાલન કરીને સર્વે નક્કા જોડાઈ
બોલારીલ ખાતે નો નિયમ મુજબ
નું કક્કમી 207 વાકેલોનું
બોલારીલ ખાતે નો નિયમ મુજબ
નું કક્કમી 207 વાકેલોનું
બોલારીલ ખાતે નો નિયમ મુજબ
નું કક્કમી 207 વાકેલોનું
બોલારીલ ખાતે નો નિયમ મુજબ

FLOOR	AREA
GROUND FLOOR	722.56
FIRST FLOOR	721.56
SECOND FLOOR	721.56
THIRD FLOOR	305.36
TOTAL	2471.04

STAMP OF APPROVAL PLAN 1 & 2



OWNER'S/PAN FLOOR ARCHITECT'S SIGNATURE

OWNER'S NAME: D.V. DHAWAKAR

REGD. NO. CHAI/1993

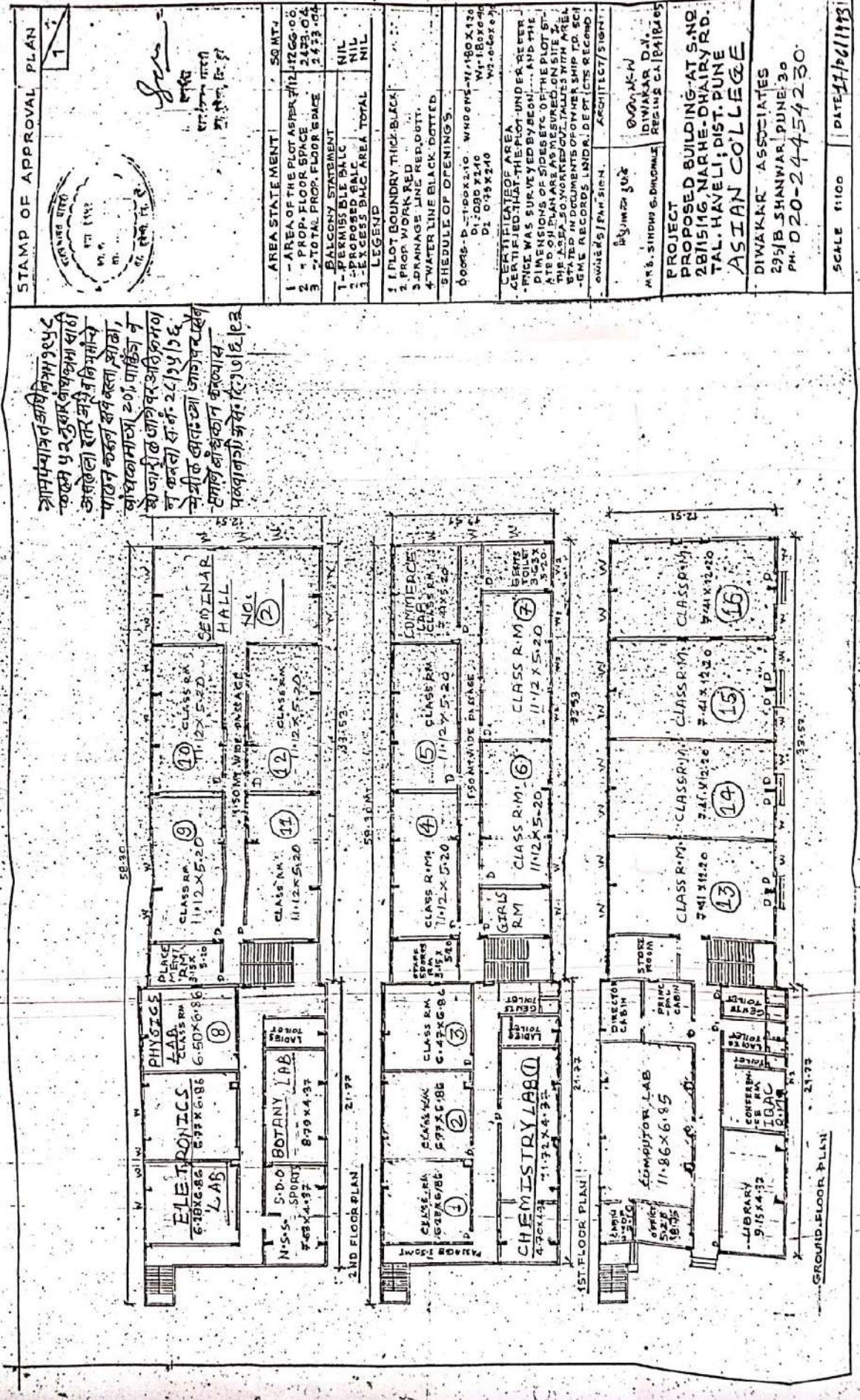
PROPOSED BUILDING AT SHRI. NARHE-DHAILY ROAD, TAL. HAVELI, DIST. PUNE

ASIAN COLLEGE

DHAWAKAR ASSOCIATES
205/B CHANHYAAR
PUNE-30 PH-020244-5-230

SCALE: 1:100 DATE: 17/06/1993

THIRD FLOOR PLAN



श्रीमपयात्रल आपडडडडड १९५८
 कडड ५२ नुडडडकडडडडड डडडड
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