Pune District Education Association's

Annasaheb Magar Mahavidyalaya

Hadapsar, Pune- 411028

Affiliated to Savitribai Phule Pune University, Pune

Self Study Report: 2024 (4th Cycle)

Criterion7 - Institutional Values and Best Practices

Key Indicator - 7.1 Institutional Values and Social Responsibilities

Metric: 7.1.3(QlM)

Quality audits on environment and energy regularly undertaken by the Institution.

1. Green audit / Environment audit

2. Energy audit

3. Clean and green campus initiatives

4. Beyond the campus environmental promotion and sustainability activities

Submitted to

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL BENGALURU

Metric 7.1.3 (QnM)   Green audit/Environmental audit report from recognized bodies

Index

Sr.No.	Particular
1.	Environmental Audit
2.	Energy Audit
3.	Green Audit

Environment Audit

Study Period (two years) 2021 – 2022 & 2022 - 2023

Sustainability study

AUDIT REPORT

Pune District Education Association's

Annasaheb Magar Mahavidyalaya

Survey No. 215/277, Manjari Road,

Hadapsar, Pune – 411028,

Maharashtra, India

Studied in the capacity of

Accredited and Certified

Green Building Professional

Studied by

Greenvio
Solutions

Disclaimer

The Audit Team has prepared this report for the **Pune District Education Association's Annasaheb Magar Mahavidyalaya** located at _Survey No. 215/277, Manjari Road, Hadapsar, Pune – 411028, Maharashtra, India_ based on input data submitted by the Institute analysed by the team to the best of their abilities.

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

These can be implemented phase wise or as a whole depending on the decision taken by the internal team. 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 period of time 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 as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

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

Greenvio Solutions

Developing Healthy and Sustainable Environments
We are an Environmental and Architectural Design Consultancy firm
Sustainable Academe is our department for conducting Audits
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Acknowledgement

The Audit Assessment Team extends its appreciation to the **Pune District Education Association's Annasaheb Magar Mahavidyalaya, Maharashtra** for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are extended are due to everyone from the Management.

Our heartfelt thanks are extended to Chairperson of entire process **Dr. Nitin L. Ghorpade,** (Principal) for the valuable inputs.

We are also thankful to Institute's Task force who have played a major role in data collection.

- ➲ Faculty members – **Dr. Joshi Ramakant P**. (IQAC Co-ordinator); **Dr. Shubhangi Shinde,** Criteria 7 Incharge *(Special mention for the excellent coordination)*.

- ➲ Admin staff members – **Mr. Sabale G. S.**

- ➲ Non-teaching staff members – **Mr. Bagade D. S.**

We appreciate the cooperation of 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

Contents

Greenvio
Solutions

1. Introduction

1.1 Statements of the Institution

1.1.1 Vision

The Institute proposes _"Becoming and institution of Educational Excellence by imparting higher Education."_

1.1.2 Objectives

The Institute adheres and focuses:

- _Providing relevant educational facilities_
- _Equipping with requisite knowledge and holistic development methods._
- _Internalizing personality development_
- _Introducing job-oriented and professional courses_
- _Broadening awareness of human rights, value systems, culture and heritage_
- _Developing scientific temperament and environmental awareness._

1.2 Assessment of the Institute

1.2.1 Affiliation

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.

1.2.2 Certification

The College has received the code under **All India Survey of Higher Education** (AISHE) wherein the code is C-41752.

1.2.3 Recognitions

The College is recognised under the **section 2(f) and 12 (B) of the University Grants Council Act, 1956**.

1.2.4 Accreditation

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

Cycle	First	Second	Third
CGPA	81.60	3.08	2.49
Grade	B++	A	B
Year	2004	2012	2018

Table 1: NAAC Accreditation details of the Institute

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

1.3   Facilities

The team emphasize on latest technological advancement through its educational initiatives. Some of the key facilities are listed below.

- ⮕ Well-equipped classrooms, gymnasium
- ⮕ Well stocked library and multiple laboratories
- ⮕ Outdoor sports facilities
- ⮕ Various environmental pockets
- ⮕ Dedicated compost pit zone

2. Overview

2.1 Summarised Populace analysis for 2022-2023

2.1.1 Students data

The data (shared by the Institute) shows there were a total of **2,793 male and 1,909 female students.**

2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	07	04	11
2	Teaching staff	48	84	132
3	Non-Teaching staff	37	07	44
Total Staff Members		92	95	187

Table 2: Staff data of the Institution for 2022-2023

The staff data shows the Institute premises had a total of **187 Staff Members.**

2.2 Summarised Populace analysis for 2021-2022

2.2.1 Students data

The data (shared by the Institute) shows there were a total of **3,027 male and 2,014 female students.**

2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	07	04	11
2	Teaching staff	54	77	131
3	Non-Teaching staff	37	07	44
Total Staff Members		98	88	186

Table 3: Staff data of the Institution for 2021-2022

The staff data shows the Institute premises had a total of **186 Staff Members.**

3. Research

3.1   Site Area & Institute Building Spread Area

The **site area is 5.2 acres** with a built-up area of **1,35,657 sq. ft. approximately 4,889 nos. of footfalls.**

3.2   Institute Infrastructure

3.2.1 Establishment

The Institute was established in **1971**.

3.2.2 Spatial Organisation

The Institute is located in a pollution free and healthy environment.

The Building is a Reinforced Cement Concrete (RCC) framework building.

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc.

4. Investigation

4.1 Scope for improvement aspects

⮑ **Extra care for the rooftop areas**
  - o Introduce the signboards about 'No students are allowed to enter this area'
  - o Increase the height of parapet walls
  - o Upgrade the space as cool roof by painting it with cooltop material.
  - o Undertake feasibility study of before and after temperature reading.
  - o Take precautions to keep terrace areas free of any kind of storage materials

⮑ **Messages on the beam area**

Include quotes and messages from eminent personalities all over the premises on beam for inspiration and beautification.

⮑ **General aspects (Outdoor areas)**
  - o Increase in green cover on rooftop
  - o Placards and manuals for awareness
  - o Dedicated reserved parking for physically disabled
  - o Development of breakout zones at relevant locations
  - o Develop plantations around the vertical garden areas
  - o Develop paved walkways
  - o Introduce information boards everywhere
  - o Increase sensitization programmes
  - o Upgrade the website w.r.t. green initiatives
  - o Refill the fire extinguishers
  - o Introduce zone wise details at relevant locations

5. Documentation

5.1 Open Spaces

There is an open space in the plot utilised by all the shared campuses, this provides a good amenities and recreational spaces feature in premises.

5.2 Flora audit

A flora survey was carried out to identify the total numbers of plants and trees. The landscape area has a variety of plantations the details of the same are documented below.

S. No.	Plant name	Type	Nos.
1	*MicheliachampacaL.*	Tree	3
2	*Artabotryshexapetalus(L.f.)Bhandari*	Climber-Woody	3
3	*Polyalthialongifolia(Sonner.)Thw,Enum.*	Tree	8
4	Nymphaeasp.PeachGlow	Herb	16
5	*DianthuschinesisL.*	Herb	8
6	*DianthusplumariusL.Synonyms:CaryophyllusplumariusMoench*	Herb	45
7	*PortulacagrandifloraHook*	Herb	5
8	*AlcearoseaL.Synonym:AlthaearoseaCav*	Herb	5
9	*Hibiscusrosa-sinensisL.*	Shrub	10
10	*MalvaviscupenduliflorusDC.*	Shrub	15
11	*BombaxceibaL.*	Tree	10
12	*MuntingiacalaburaL.*	Climber	6
13	*GalphimiaglaucaCav.*	Shrub	8
14	*PelargoniumvitifoliumL.Ait.,Hort. Synonym:GeraniumvitifoliumL*	Herb	14
15	*ImpatiensbalsaminaL.*	Herb	5
16	*Aeglemarmelos(L.)Corr.*	Tree	10
17	*Citrusaurantifolia(Christm.&Panz.)Swing.*	Tree	2
18	*CitruslimettaRisso.*	Tree	21
19	*Murrayakoenigii(L.)Spreng.*	Shrub	8
20	*AzadirachtaindicaA.Juss.*	Tree	10

21	Commiphorawightii(Arn.)Bhandari Synonyms: Commiphora mukul(Stocks)Hook.	Shrub or smalltree	30
22	CissusquadrangularisL.	Climber	50
23	MangiferaindicaL.	Tree	5
24	AbrusprecatoriusL.	Climber	25
25	ClitoriaternateaL.	Climber	8
26	Saracaasoca(Roxb.)Wild. Synonyms:SaracaindicasensuBedd.L.	Tree	9
27	CassiasiameaLam.	Tree	7
28	CassiasurattensisBurm.f.)H.S.Irwin&Barneby	Tree	51
29	TamarindusindicaL.	Tree	9
30	BauhiniaacuminataL.	Shrub/ middlesizedtree	6
31	Delonixregia(Hook.)Raf.	Tree	5
32	Caesalpiniapulcherrima(L)Sw.	Shrub	4
33	Albizialebbeck(L.)Willd	Tree	5
34	Pithecellobiumdulce(Roxb.)Benth&Hook.Synonyms:Mimosadulce (Roxb.)	Tree	5
35	Prosopiscineraria(L)Druce	Tree	8
36	MimosapudicaL.	Tree	9
37	Rosasp.	Herb or smallshrub	3
38	BryophylumpinnatumOken	Herb	24
39	Graptoveriaopalina	Herb	7
40	QuisqualisindicaL.	Climber	9
41	Terminaliacatappa L.	Tree	5
42	Callistemonlanceolatus (Sm.)Sweet	Tree orshrub	5
43	EucalyptusglobulusLabill.	Tree	9
44	PsidiumguajavaL.	Tree	8
45	Syzygium cumini(L.)Skeels, Synonyms:Eugenia jambolanaLam.	Tree	8
46	XanthostemonyoungiiC.T. White &W. d. Francis	Shrub	8
47	Tibouchina urvilleanaCogn.	Shrub	6
48	Lagerstroemiaspeciosa(L) Pers.	Tree	10
49	PassifloracaeruleaL.	Climber	2

50	*PassifloraincarnataL*	Climber	3
51	*Cereus peruvianus Mill*	Shrub	5
52	*EchinocactusgrusoniiHildm.*	Shrub	2
53	*Epiphyllum oxypetalum*	Shrub	9
54	*Hamelia patensJacq.*	Shrub	8
55	*Ixora coccineaL.*	Shrub	9
56	*Mussaendaerythophylla Schumach & Thonn.*	Shrub	2
57	*Mussaenda frondosa,L.*	Shrub	5
58	*Pentaslanceolata (Forsk)Deflers*	Herb	2
59	*Chrysanthemum indicumL.*	Herb	9
60	*GaillardiaaristataPursh*	Herb	7
61	*GaillardiapulchellaFoug.*	Herb	34
62	*Spilanthes acmellaMurr. Synonyms:S. paniculata, SpilanthescalvaDC.*	Herb	6
63	*Tagetuserecta L.*	Herb	3
64	*PlumbagoauriculataLam.*	Herb	9
65	*Plumbago zeylanicaL.*	Herb.	24
66	*Jasminum samba(L.)Aiton*	Shrub	22
67	*Nyctanthesarbor-tristisL.*	Shrub or smalltree	20
68	*Adenium obesumRoem. &Schult.*	Tree (Bonsai)	3
69	*Allamanda blanchetiiA. DC.*	Climer	5
70	*AllamandacatharticaL.*	Climer	3
71	*AlstoniascholarisL. R.Br.*	Tree	3
72	*Cascabellathevetia(L)*	Shrub or smalltree	2
73	*Catharanthusroseus(L.)G. Don.*	Herb	5
74	*NeriumindicumMill. Gard.*	Shrub	5
75	*PlumerialbaL.*	Tree-Small	9
76	*Plumeria pudicaJacq.*	Tree-Small	8
77	*PlumeriaobtuseL.*	Tree-Small	9
78	*PlumeriarubraL. Synonyms :Plumeria acutifoliaPoir.*	Tree-Small	4

79	*CestrumnocturnumL.*	Climber	1
80	*Petuniagrandiflora*	Herb	5
81	*Withaniasomnifera(L.)Dunal.*	Shrub	6
82	*Russelia equisetiformrsSchltDl. & Cham. Synonyms RusseliajunceaZucc.*	Shrub	6
83	*Campsis radicansSeem. Journ.*	Shrub	3
84	*Dolichandra unguis-cati(L.) Miers Synonyms:Bignonia unguis-catiL.*	Climber	5
85	*Jacaranda acutifolia Humb&Bonpl*	Tree	1
86	*Pandorea jasminoides(Lindl.) K. Schum.cultivaralba*	Climber	2
87	*Pyrostegia venusta(Ker Gawl.)MiersSynonyms :Bignoniavenusta KerGawl.*	Climber	3
88	*Justicia adhatodaL. Synonyms:Adhatodavasica Nees*	Shrub	6
89	*Thunbergialaevis Nees*	Climber	8
90	*Thunbergiagrandiflora(Roxb. ExRottl.)*	Climber	8
91	*Clerodendrum wallichiiMerr.*	Shrub	2
92	*ClerodendrumthomsoniaeBalf.f.*	Climber	6
93	*LantanacameraL.var.aculeata*	Tree	6
94	*LantanainvolucrataL.*	Shrub	9
95	*Lantana montevidensis(Spreng) Brig*	Shrub.	8
96	*OcimumtenuiflorumL. , Synonym:OcimumsanctumL.*	HerborUnderShrub	10
97	*Ocimum americanumL.Synonym:Ocimumcanum,Sims.*	HerborUnderShrub	1
98	*OcimumbasilicumL.*	HerborUnderShrub	10
99	*Plectranthusscutellarioides (L.) R. Br.Synonyms: Coleus blumeiBenth.*	Herb	2
100	*Plectranthus amboinicusLour. Synonyms:Coleus amboinicus*	Herb	6
101	*CelosiaargenteaL. var. cristata*	Herb	6
102	*CelosiaspicataL. Sp.*	Herb	8
103	*Gomphrena globosaL.*	Herb	3
104	*CinnamonverumPersl Synonyms:Cinnamon zeylanicumBlume*	Tree	3
105	*PiperbetleL.*	Climber	3

106	*PipernigrumL.*	Climber	3
107	*Grevillea robustaA.Cunn. Ex.R.Br.*	Tree	4
108	Acalyphawilkesiana Muell-Arg	Shrub	40
109	Acalypha hispida Burm.	Shrub	4
110	*Codiaeumvariegatum var. angustifolium*	Shrub	2
111	*Codiaeumvariegatumvar. Pictum, (L.) Bl., Bijdr.*	Shrub	2
112	*Codiaeumvariegatum var. Spirale*	Shrub	2
113	*Euphorbia milliCh. Des. Moulins*	Shrub	2
114	*Euphorbia pulcherrimaWilld. exKlotzsch*	Shrub	3
115	*JatrophagossipifoliaL.*	Shrub	9
116	*Jatropha integerrimaJacq.Synonyms:Jatropha pandurifoliaAndr. Jatropha hastateJacq.*	Shrub	5
117	*PhyllanthusemblicaL.Synonyms:Emblica officinalisGaertn.*	Tree	5
118	*Ficus benghalensisL.*	Tree	5
119	*Ficus benjaminaL.*	Tree	5
120	*Ficus racemosaLinnSynonyms:Ficus glomerataRoxb.*	Tree	5
121	*FicusreligiosaL.*	Tree	6
122	*Costus igneusN.E. Br.*	Herb	6
123	*Cannaindica L*	Herb	5
124	*Canna flaccidaRosc.*	Herb	5
125	*StrelitziareginaeBanks*	Herb	6
126	*Scadoxusmultiflorous(Martyn)Raf.*	Herb	5
127	*Zephyranthescandida(Lindl.) Synonyms:AmarylliscandidaLindl.*	Herb	5
128	*SansevieriatrifasciataPrainSynonyms:Dracaena trifasciataPrain*	Herb	4
129	*Polianthestuberosa L.*	Herb	8
130	*Dracaena fragrans(L.)Ker Gawl.*	Shrub	6
131	*Cordylinerubra Otto &A. Dietr*	Shrub or smalltree	2
132	*Cordyline fruticosa(L.) A. Chev. Synonyms :Dracaenaterminalis L.*	Shrub or smalltree	10
133	*Aloe vera(L.)Burm*	Herbunder Shrub	5
134	*Asparagusdensiflorus(Kunth) Jesso*	Herb	8

135	*Asparagusplumosus Baker., J. Linn*	Climber	9
136	*Asparagusracemosus Willd.*	Climber	6
137	*Chlorophytumcomosum(Thunb.)Jacques*	Herb	3
138	*Rhoeospathacea (Sw.)*	Herb	5
139	*Tradescantiapallida(Rose) D. R. Hunt*	Herb	7
140	*Tradescantiazebrina(Schinz) D. R.Hunt*	Herb	4
141	*Tradescantia spathaceaSw.Synonyms:Rhoeo discolor (L'Her.)Hance*	Herb	12
142	*Cocos nuciferaL.*	Tree	41
143	*Roystonearegia (Kunth)O.F. Cook Synonyms: Oreodoxa regia Kunth*	Tree	8
144	*Licualagrandis(hort. ExW. Bull) H. Wendl*	Shrub	35
145	*Livistonarotundifolia(Lamarck)Mart.Synonyms: Saribusrotundifolius(Lamarck)Blume*	Tree	31
146	*Wodyetiabifurcate A.K. Irvine*	Tree	6
147	*Acorus calamusL.*	Herb	9
148	*AglaonemacommutatumSchott*	Herb	8
149	*AglaonemaModestum*	Herb	8
150	*Aglaonemawiduri*	Herb	50
151	*Aglaonema nitidum*	Herb	5
152	*Dieffenbachia seguine(Jacq.)Schott*	Herb	5
153	*Dypsis lutescens(H. Wendl.) Beentje & J. Dransf.*	Tree	6
154	*Epipremum aureum(Linden &André)*	Climber	7
155	*MonsteradeliciosaLiebm.*	Herb	6
156	*Pothos ScandensL.*	Climber	6
157	*Spathiphyllumcochlearispathum(Liebm.) Engl.*	Herb	6
158	*Vitiveriazizanoides(L.)*	Herb	6
159	*Cymbopogon citratus(DC.) Stapf.*	Herb	5

Table 4: Details of the Flora in the premises

At present there are 1,400 numbers of plantations in the premises. All of these are planted by the on various occasions and some have grown naturally.

5.3   Fauna audit

There are varieties of biodiversity available as fauna in the premises.

Fauna	Family	Local Name	Scientific name
Birds	Apodeidae	Jungle Crow	*Corvus culminatus*
		Swift	*Apus*
Insects	Nymphalidae	Common crow butterfly	*Euploea core*
	Mantidae	Green Praying mantis	*Mantis*
Reptiles	Blattidae	Cockroach	*Periplaneta americana*
	Scincidae	Indian skink	*Eutropis spp*

Table 5: Details of the fauna in the premises

5.4   Noise Audit

On a macro level the Institute is surrounded by public buildings and minimal residential blocks **thus there is a peaceful and noise free arena observed inside the premises.**

5.5   Carbon Footprint Audit

5.5.1 Eco-friendly Commuting Practices

- The site is located in an urban locality.
- Overall, the carbon footprint is well under control.
- Students and staff members commute using public transport.
- There are no major fossil fuels used inside the premises.

5.5.2 Heat Island Reduction

Certain measures have to be taken to keep outdoor temperatures under control.

5.5.3 Outdoor Light Pollution Study

The Institute compound lights are not upward looking thus, these do not cause light pollution.

5.6   Universally accessible premises

As per World Report on Disability, 2011 there are 180 million approx. Persons with Disabilities that makes it 15% of total population of India. The following facilities are available on the premises for the specially-abled as part of universally accessible premises initiatives.

- ⮑ Low height risers in the staircases, Non-slippery floor surfaces

- ⮑ Handrails for support

- ⮑ There can be lifts in all blocks

5.7   Fire Safety

Fire and life safety are an important consideration of the National Building Code 2016. This aspect is touched upon as part of this study in the capacity of an Architect registered with the Council of Architecture. As part of the research, fire safety audit was considered from the 'Building systems' perspective. *At present, the following are available in the premises.*

- ⮑ Fire extinguisher and sand buckets.
- ⮑ Open staircase without any barriers and free of storage or combustible material.

6. Suggestions

The following suggestions are section-wise recommendations and are supposed to be **executed within the next 2.5 years from the date of the Report submission.** The Institute can execute a plan after discussion with Project Head.

6.1 Site beautification

No changes proposed for this section

6.2 Heat island reduction

Cool rooftops - The Terrace rooftops should be painted with Cooltop – reflective materials to reflect the harsh sun rays and reduce the heat absorption in the top most floor and surrounding areas of the building.
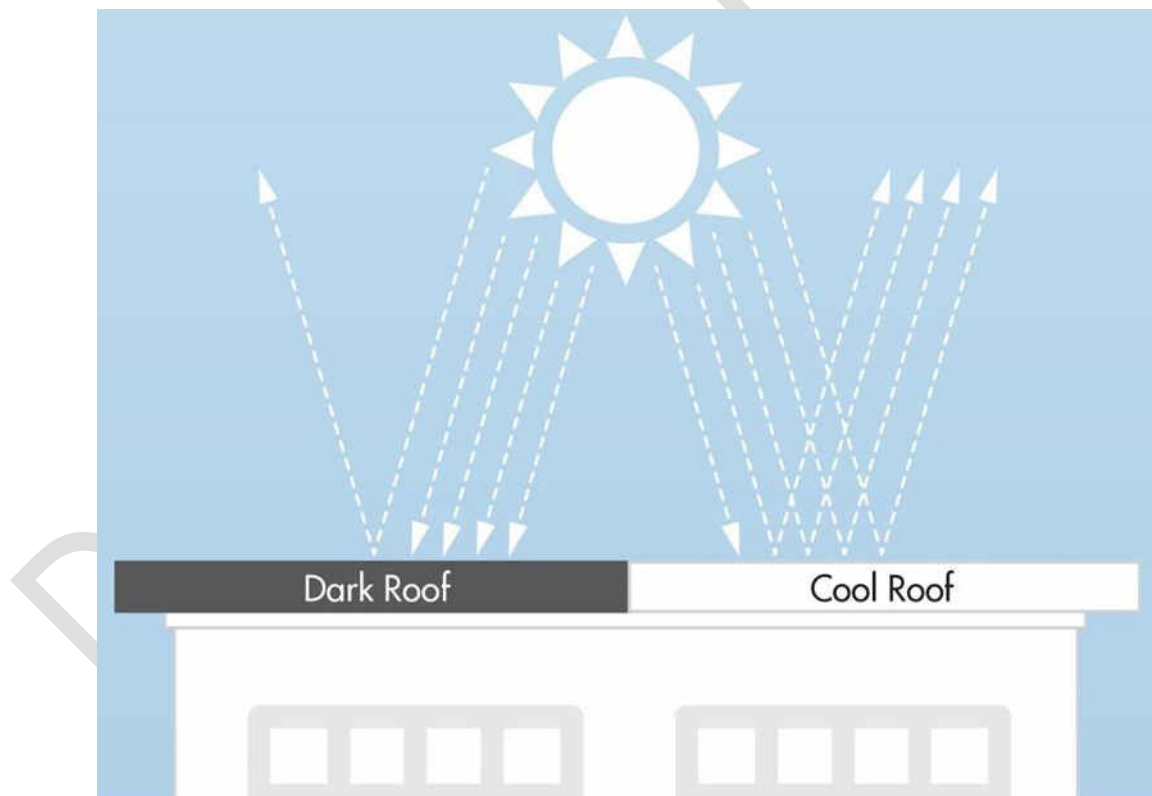
Plate 1: Cool roof comparative analysis (For reference purpose only)

Source: Image by https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387

6.3 Universally accessible premises

➲ **Universal Toilet -** There should be a minimum of 1 toilet in every block for the specially-abled people as per guidelines of National Building Code 2016.

➲ **Provisions for visually impaired - Tactile flooring** – The indoor and outdoor of the premises should have dedicated tactile flooring for the visually impaired.

➲ **Design up gradation for Inclusive premises** – The following activities can be undertaken:

- Wheelchair, Lifts in every block so that every block has its own wheelchair.
- Include Disability Services staff/students with disabilities on planning boards and offer multiple ways to participate in programs
- Information/materials provided in multiple forms (Standard, electronic, large print, Braille)
- Class outlines/notes are available for all students on accessible websites.

6.4 Life safety

➲ **Fire station** – A dedicated fire station could be established within the premises as part of the Fire and Life safety practices.

➲ **Combustible equipment** - Every space which has a gas cylinder or combustible equipment should have a provision for the barricade around the gas cylinders, appropriate safety board's mentioning 'danger sign' and 'Do not touch' with an additional small fire extinguisher close by.

➲ **Fire and life safety practices** – Provisions such as signages, fire alarm, smoke detectors, fire hydrant cabinets, sand buckets, hose reel, fire cabinet, fire water tank and fire pump near the entrance block whichever is applicable should be practiced.

➲ **Sensitization programs** - Regular seminars/ webinars by experts such as Architects, Govt. Fire department on subjects related to fire and life safety should be organized and the outputs should be adopted and documented.

6.5   Pollution Control

➲ **Battery charging points for Eco-friendly vehicles -** There can be provision for battery charge points, this would inspire students to change their mode of transportation and adopt sustainable practices.

➲ **Bicycles as a gift -** As an appreciation gesture maybe the student's toppers/ staff best performers can be awarded a bicycle occasionally.

➲ **Paperless technologies for offices -** The Institute can go technology-friendly and go paperless in the functioning of premises to a certain extent maybe not fully.

➲ **Plant more radiation absorbing plants -** The following flora halps in redcuing the harmful effects to a cetain extent, the Institute can develop a radiation free zone and take to planting these through potted plants or permanent planting:

  – Spider plant

  – Rubber plant

  – Asparagus fern

  – Snake plant

  – Nelumbo nucifera (Includes colourful flowers)

  – Cactus

  – Areca palm

  – Mustard green

  – Betel

  – Aloe vera

  – Sprengers asparagus

  – Fiddle fig

Evidence of the visit - group photo with the core team

Investigative parameters – Ecological Aspects – Nursery in the premises and sapling plantation

Investigative parameters – Site Aspects – E-waste bin, Campus and batteries for backup

Investigative parameters – *Outdoor areas of premises*

7. Compilation

The study is based on the data collected, analyzed, 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 analyze and study the data collected.

- ⮑ 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

- ⮑ BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada

- ⮑ Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorizes vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.

- ⮑ Reference images for suggestions:

    - ☐ https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387

    - ☐ https://earthbound.report/2021/07/14/5-ways-to-reduce-the-urban-heat-island-effect/

ENERGY AUDIT

STUDY PERIOD (TWO YEARS) 2021 – 2022 & 2022 - 2023

AUDIT REPORT

Studied for

Pune District Education Association's

Annasaheb Magar Mahavidyalaya

Survey No. 215/277, Manjari Road,

Hadapsar, Pune – 411028,

Maharashtra, India

Studied in the capacity of

Accredited and Certified

Green Building Professional

Studied by

Greenvia
Solutions

Disclaimer

The Audit Team has prepared this report for the **Pune District Education Association's Annasaheb Magar Mahavidyalaya** located at *Survey No. 215/277, Manjari Road, Hadapsar, Pune – 411028, Maharashtra, India* based on input data submitted by the Institute analysed by the team to the best of their abilities.

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

These can be implemented phase wise or as a whole depending on the decision taken by the internal team. 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 period of time 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 as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

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

Greenvio Solutions

Developing Healthy and Sustainable Environments
We are an Environmental and Architectural Design Consultancy firm
Sustainable Academe is our department for conducting Audits
Palghar District, Maharashtra- 401208
sustainableacademe@gmail.com

Acknowledgement

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Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

Greenvio

1. Introduction

1.1 Statements of the Institution

1.1.1 Vision

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1.1.2 Objectives

The Institute adheres and focuses:

- _Providing relevant educational facilities_
- _Equipping with requisite knowledge and holistic development methods._
- _Internalizing personality development_
- _Introducing job-oriented and professional courses_
- _Broadening awareness of human rights, value systems, culture and heritage_
- _Developing scientific temperament and environmental awareness._

1.2 Assessment of the Institute

1.2.1 Affiliation

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.

1.2.2 Certification

The College has received the code under **All India Survey of Higher Education** (AISHE) wherein the code is C-41752.

1.2.3 Recognitions

The College is recognised under the **section 2(f) and 12 (B) of the University Grants Council Act, 1956**.

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

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Year	2004	2012	2018

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

1.3   Facilities

The team emphasize on latest technological advancement through its educational initiatives. Some of the key facilities are listed below.

- ⮌ Well-equipped classrooms, gymnasium
- ⮌ Well stocked library and multiple laboratories
- ⮌ Outdoor sports facilities
- ⮌ Various environmental pockets
- ⮌ Dedicated compost pit zone

2. Overview

2.1 Summarised Populace analysis for 2022-2023

2.1.1 Students data

The data (shared by the Institute) shows there were a total of **2,793 male and 1,909 female students.**

2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	07	04	11
2	Teaching staff	48	84	132
3	Non-Teaching staff	37	07	44
Total Staff Members		92	95	187

Table 2: Staff data of the Institution for 2022-2023

The staff data shows the Institute premises had a total of **187 Staff Members.**

2.2 Summarised Populace analysis for 2021-2022

2.2.1 Students data

The data (shared by the Institute) shows there were a total of **3,027 male and 2,014 female students.**

2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	07	04	11
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Total Staff Members		98	88	186

Table 3: Staff data of the Institution for 2021-2022

The staff data shows the Institute premises had a total of **186 Staff Members.**

3. Research

3.1 Site Area & Institute Building Spread Area

The **site area is 5.2 acres** with a built-up area of **1,35,657 sq. ft. approximately 4,889 nos. of footfalls.**

3.2 Institute Infrastructure

3.2.1 Establishment

The Institute was established in **1971**.

3.2.2 Spatial Organisation

The Institute is located in a pollution free and healthy environment.

The Building is a Reinforced Cement Concrete (RCC) framework building.

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc.

4. Investigation

4.1   Observations

The following points were observed during the investigation.

- **Lights** - All lights are in working conditions. There was no fuse defect observed.

- **Fans** - All fans are in working conditions. Windows do not have cracks and are caulked appropriately.

- **Air conditioners** - The Outdoor units were cleaned maintained and had no dust collection problems.

- **Equipment** - All equipments are in working conditions and daily monitoring is done by the maintenance staff and admin staff in an excellent manner.

- **General** - No defect was found in any appliance of electrical consumption.

4.2   Energy efficiency analysis

4.2.1 Energy efficient practices for alternative sources

Additional provisions that can be introduced in the near future are noted below:

- Solar tree
- Solar parking

4.2.2 Energy efficient equipment

- The premise has LED Lights in multiple spaces.
- The air conditioners are BEE star labelled appliances, the old ones are supposed to be replaced soon.
- There are no energy efficient fans in the premises.

5. Documentation

5.1 Primary sources of energy consumption

➲ **Electrical (Metered) –** Light, Fans, Equipments, Pumps comprise these sources.

➲ **Renewable energy –** There are **'SOLAR System and Sensor based light system' as sources of renewable energy** available in the premises.

5.2 Secondary sources of energy consumption

The premise uses batteries, UPS as backup for administrative purposes. The details of the existing sources are documented below:

S. No.	Name	Nos.
1	UPS	02
2	Inverters	02
3	Gas cylinders	20

Table 4: Details of secondary sources of energy consumption

5.3 Actual electrical consumption as per bills

The Institute does has rooftop solar panels installed and thus reaps benefits in billing units every month, the data has been documented accordingly.

S. No.	Month	Year	(A) Total units consumed	(B) Solar units generated	(C = A-B) Gross units consumed after deduction
Academic year 1 2021-22					
1	June	2021	2,597	278	2,319
2	July	2021	5,113	311	4,802
3	August	2021	3,835	313	3,522
4	September	2021	3,911	329	3,582
5	October	2021	4,008	321	3,687
6	November	2021	4,125	306	3,819
7	December	2021	5,924	551	5,373

8	January	2022	5,100	317	4,783
9	February	2022	4,355	302	4,053
10	March	2022	5,119	347	4,772
11	April	2022	9,640	1,223	8,417
12	May	2022	7,293	458	6,835

Table 5: Details of the electrical consumption

5.4 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, air conditioner, and equipment. The inventory and data collection for sources of energy consumed in the premise in summarised in the following sections. The following documentation is based on the consumption practice of the premises on a regular working day.
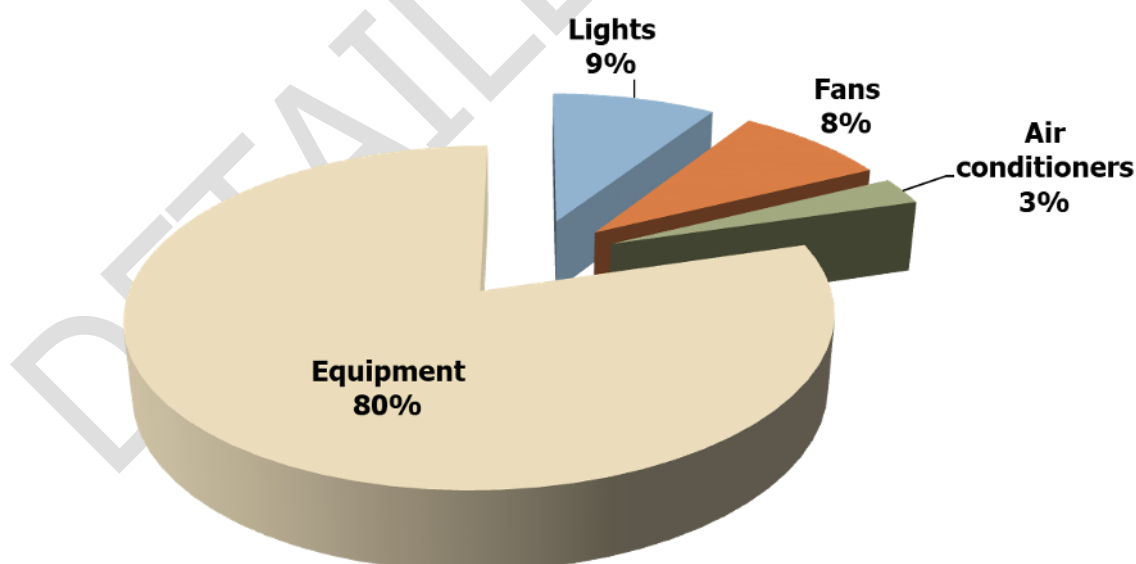
Figure 1: Summary of the calculated electrical consumption as per inventory

The above graph shows that equipment consume 80% whereas the lights consume 9% while the fans consume 8% and the air conditioners consume 3% of the total calculated electrical energy.

5.5   Lights

### 5.5.1   Types of lights based on the numbers

There are a total of **835 lights on the premises;** the following table shows the various types of lights on the premises.

S. No.	Type	Nos.
1	CFL (Non-Energy efficient appliance)	20
2	Halogen (Non-Energy efficient appliance)	15
3	Non-LED (Non-Energy efficient appliance)	399
4	*LED (Energy efficient appliance)*	*401*

Table 6: Summary of the types of lights on-premise

5.5.2   Types of lights based on the power consumption

The energy consumption of lights is **38,043 kWh** of energy.
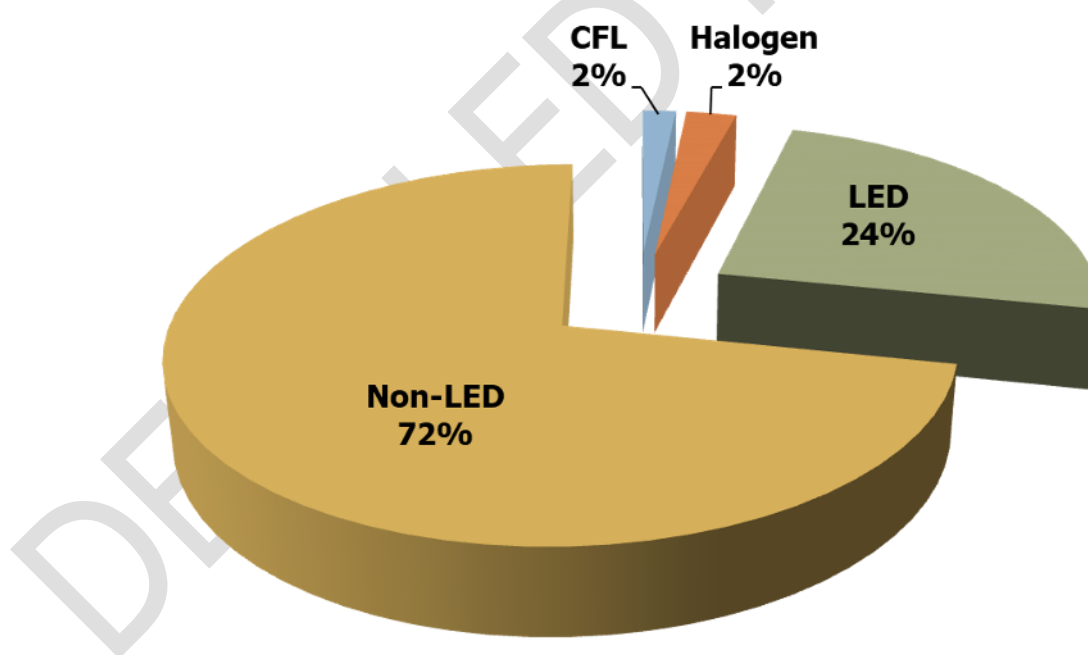
Figure 2: Energy consumed by types of lights in the premise based on the usage study

The analysis of the types of Lights on-premises shows **Non-LED lights consume 72%** whereas the **LED lights consume 24%** while the **Halogen and CFL lights consume 2%** of the total power consumed by lights.

5.6   Fans

5.6.1 Types of fans based on the numbers

There are a total of **372 Ceiling fans** in the premises.

5.6.2 Types of fans based on the power consumption

The energy consumption of fans is **35,363 kWh** of the energy with the **Ceiling fans consuming 100%** of the total power consumed by fans.

5.7 Air conditioners

5.7.1 Types of air conditioners based on the numbers

There are **5 air conditioners** on the entire premises**.**

5.7.2 Building-wise consumption analysis

The energy consumption of air conditioners is **11,289 kWh** of energy.

5.7.3 About the replacement of current air conditioners

- The current air conditioners are well maintained.

- Though there is not an immediate requirement for replacement.

- Whenever the Institute undergoes redevelopment there can be provisions for replacement with energy-efficient appliances or new air conditioners that require less power consumption.
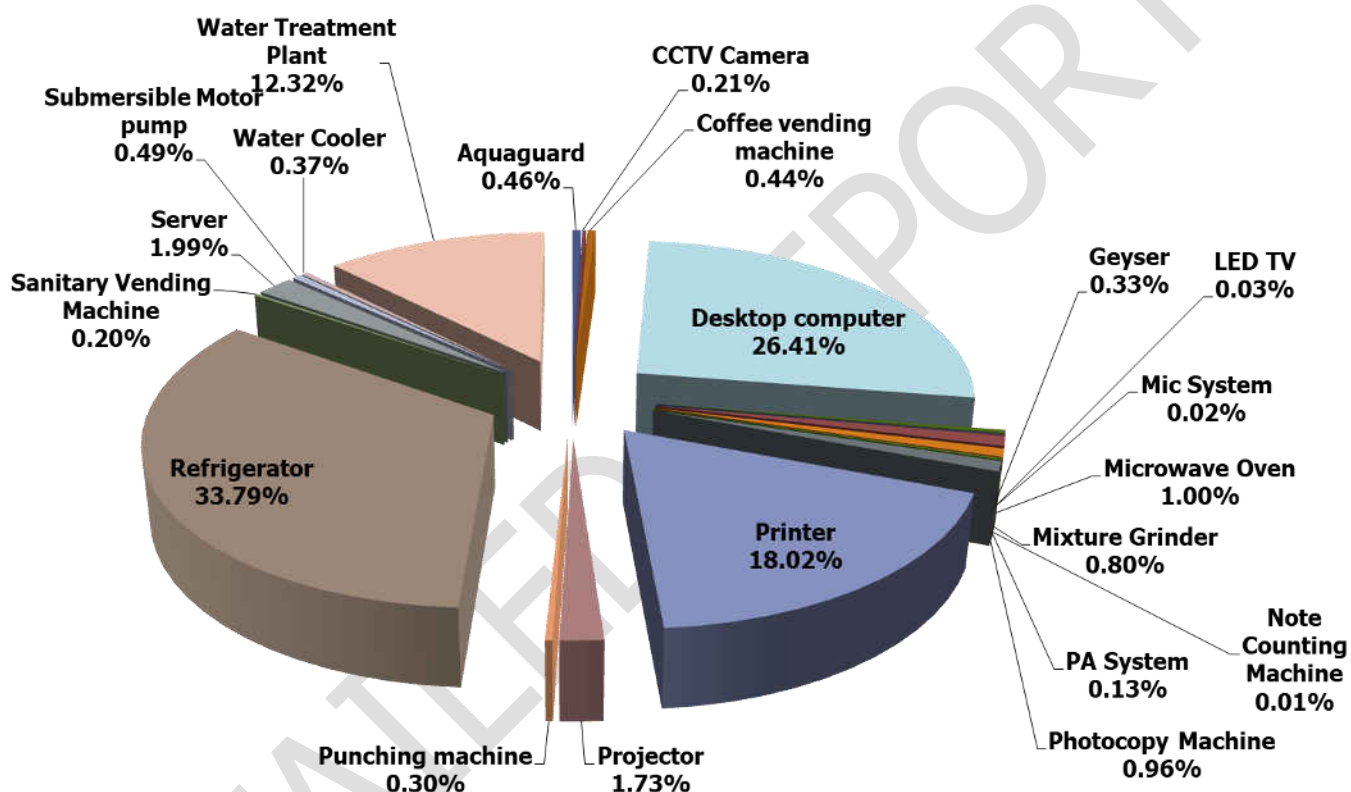
5.8   Equipment

5.8.1 Types of Equipment

There are **658 nos. of equipment** in the Educational sector.

5.8.2 Types of equipment as per their energy contribution

The energy consumption of equipment is **3,30,572 kWh** of energy.

Figure 3: Energy consumed by types of equipment in the educational sector based on the usage study

The above summary shows that the **refrigerator consumes more energy at 33.79%** while the **desktop computer consumes 26.41%** whereas the **printer consumes 18.02%** and the **water treatment plant consumes 12.32%** these are the maximum consumers as compared to other equipment.

6. Suggestion

6.1 Section-wise suggestions

The following suggestions are to be considered as a ***first priority*** for implementation. These **should be executed within the next 2.5 years** **from the date of the Report submission.** The Institute can execute a plan after discussion with Project Head.

6.1.1 Electromechanical systems – Electrical and Lighting

Section 1 – Non-LED lights

The current light analysis shows that Non-LED lights consume anywhere between 50W to 54W and even more when in use; these should be replaced with LED lights which consume on an average 12-16W when in use.

Our technical research shows that there would be a reduction of an average of **67% reduction** in energy consumption if replaced with energy efficient appliance.

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

Section 2 – Ceiling fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 45W when in use. These should be replaced with energy efficient fans consuming 14W when in use.

Our technical research shows that there would be a reduction of an average of **69% reduction** in energy consumption if replaced with energy efficient appliance.

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

6.2 General suggestions

The following are consolidated study related to 'entire Institute' should be considered as ***second priority*** once section wise recommendations are implemented.

6.2.1 Alternatives to increase renewable energy

6.2.1.2 Solar parking

The University can turn its existing parking areas into solar panel powered parking areas. This will provide shade and renewable energy benefit to the University.

Plate 1: Solar parking concept for the Institute (For reference purpose only)
Source: Image by https://solarpowerproject.in/solar-panels-for-parking-lots.php

6.2.2.2 Smart gardening

The Institute can undertake a Smart Gardening system using IoT Technology. This will result in saving time by scheduling time for watering; saving money through automated water schedules tracking dampness of soil to know when, how much water garden needs.

Plate 2: Solar farm concept for the Institute (For reference purpose only)
Image source: https://housing.com/news/smart-gardening/
Data source: https://www.happysprout.com/inspiration/what-is-smart-gardening/

Evidence of the visit - group photo with the core team

Investigative parameters – Ecological Aspects – Nursery in the premises and sapling plantation

Investigative parameters – Site Aspects – E-waste bin, Campus and batteries for backup

Investigative parameters – *Outdoor areas of premises*

7. Compilation

The study is based on the data collected, analyzed, 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 analyze and study the data collected.

Specific references for study related to energy

➲ https://www.energy.gov/eere/buildings/zero-energy-buildings

➲ https://www.dsaarch.com/zero-net-positive-energy

➲ U.S. Energy Information Administration

➲ https://www.happysprout.com/inspiration/what-is-smart-gardening/

➲ https://housing.com/news/smart-gardening/

➲ Inference study reference image

https://seors.unfccc.int/applications/seors/attachments/get_attachment?code=NG125P FE4WHMWSYAK8TCAKIHMWX0F4QD

Green Audit

Study Period (Two Years) 2021 – 2022 & 2022 - 2023

Sustainability study

AUDIT REPORT

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Valid till **August 2024**

Background reference image Sasin Tipchai on unsplash

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The Building is a Reinforced Cement Concrete (RCC) framework building.

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc.

4. Investigation

4.1 Scope for improvement aspects

⮕ **Water tanks in all areas**

    a. Include the information about size, capacity and usage

    b. Paint the tank in light blue colour

    c. Add *signboards* about the usage such as 'Drinking' or 'Secondary'

    d. Add *signboard and map* about the process/ system in practice

⮕ **General aspects (Indoors areas)**

    a. Zoning of the site w.r.t. space wise analysis

    b. Signboards, signages, information and display boards at relevant locations.

⮕ **Library in the Campus**

    a. Include silence board at various locations and at entrance.

    b. Install book drop box system at the entrance of the library.

    c. Upgrade smart scanning system for every book

    d. Include a self service station for digitalization.

5. Documentation

5.1 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.

5.1.1 Green practices

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

- **Waste management** - *All the laboratories, classrooms, and cabin corridors are having dust bins. Laboratories are having dustbins wastage; Plastic bags are strictly banned on the college premises and canteen.*

- **Social awareness** - *The College has taken up awareness drives on various social issues for rural upliftment and regeneration in the college and surrounding villages.*

- **Cleanliness Campaign -** *The Swachha Bharat Abhiyan is carried out on college premises as well as off-premises.*

- **Silent and peaceful atmosphere –** *The College is located amidst residential areas which are well designed thus these help to maintain the pollution under control and provide a healthy ambience.*

- **Team work** – *The best quality of the College which sets it apart from other institutes is its coordinating and cooperative staff members, as for a building the foundation plays the most important role for its future similarly for an educational institute its staff members do.*

- **Signages on the plants mentioning scientific names -** *The practice of having the names of each plant and tree is executed by the College and is very beneficial.*

- **Eco club –** *The College has an active Eco Club which is one of its kind program, through this the club undertakes a lot of initiatives.*

- **Documentation of all the events –** *The best part about the College is the prompt and professional response, this was observed not only in the way the Team responded throughout the project but also through the documented data submitted be it the cleanliness report or the eco club activities report; each of these were documented and presented in a sophisticated manner which is highly appreciating.*

- **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.*

5.1.2 Community development

The details of ***extension initiatives*** under various heads in Institute are documented below:

S. No.	Type	Since	Coordinator name
1	National Service Scheme (NSS)	1975	Dr. Kulkarni Savita S.
2	National Cadet Corps (NCC)	1975	Dr. D.J Deshmukh
3	Earn while you learn scheme	1975	Dr. Gandhile D.
4	Employability Skills centre	1985	Dr. Kamble Neeta

Table 4: Details of the extension initiatives by the Institute

The details of the **_environmental activities_** conducted as part of the extension initiatives by the Institute are documented below:

S. No.	Initiative	Details	Type	Date
Academic year 1 (2021-22)				
1	Earth day	Awareness days for stakeholder sensitization	Physical	22/04/2022
2	Water day		Physical	22/03/2022
3	World Environment day		Physical	05-06-2022
4	Chimani sanvardhan upkram	Reuse of plastic: Birds Feeders and Watering devices are kept in college campus	Physical	21/03/2022
5	Vermicompost preparation in college campus	Excess vermicompost made available to stakeholders on "No profit, No loss" basis..	Physical	01-04-2022
6	E-Waste drive	E-waste colletected from each department	Physical	2021-2022
7	Environmental experiments and botanical garden	Various medicinal plants from the capmus and extra fertiilizer is disributed among the farmers	Physical	2021-2022
8	Plastic waste collected fromeach department	Institute collects the plastic from campus and hand over to 'Keshav Sit Memorial Foundation Trust' for recycling and disposal.	Physical	2021-2022
Academic year 2 (2022-23)				
9	Participation in Green College Clean College Trophy Competition. Microbiology department won third prize	Prepared Hydroponic system for plants growth	Physical	31/03/2023
10	Global hand wash day	Hand wash activity taken at NSS, Microbiology ,Envirional Science department	Physical	15/10/2022
11	Janjagruti Padyatra	Walked with studuents for	Physical	22/07/2023

		environmental awarenes		
12	Cycle Rally	Cycle rally on no pollution, go green.	Physical	25/07/2023
13	Jagtik Kapadi din	Workshop on making kapadi bag	Physical	
14	Village Survey Under NSS	Ketkavale Village, Purandar Taluka	Physical	02-01-2022
15	Jagtik Tambakhu Virodhi din	Online lecture by Lakshi Didi	Online	31/05/2023
16	Botany Fest	Lecture by Prof. Ghanekar P.R	Physical	19/04/2023
17	Vasundhara Saptaha	Lecture by Prof Shrikant Karlekar	Physical	20/01/2023
18	Khadkwasala jalashay Rakshan Mohim	Holding of various borads for awreness of Dam protection by NSS students	Physical	
19	Plastic waste collection	Plastic waste collected on 22nd of every month and handover to Sagar Mitra Oraganization for recycling	Physical	22nd of every month

Table 5: Details of the environmental initiatives undertaken by Institute

5.2 Waste Audit

Waste is an inevitable part of our lives. Over the years the awareness about waste management techniques has given a rise to rethink how the waste can be avoided 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, and waste management strategies that are implemented in addition to the newer ways that can be adopted aiming to make the premise clean and sustainable.

5.2.1   Waste produced

S. No.	Type of waste	Source	Current Disposal	Can be retreated?	Methodology
1	Solid waste	Toilets–Biodegradable waste	Soak pit connected for solid-liquid waste management	Yes	TREATED – Biogas plant can be initiated
2	Liquid waste	Toilets, washbasins		Yes	TREATED - Sewage treatment plant can be initiated
3	Paper waste	Newspaper and other paper	Given to vendor	Yes	TREATED – A recycling plant can be initiated
4	E-waste	Computers - Non-biodegradable waste		Yes	CONTINUE with the current practice
5	Plastic waste	Bottles, wrappers		Yes	
6	Dry waste in form of leaves	Open space & plantations, papers - Non biodegradable waste	TREATED – Dedicated zone where vermin-composting is undertaken	Yes	CONTINUE with the current practice
7	Organic regular waste	Dust, dirt dust waste from indoor spaces			
8	Bio-waste	Sanitary waste	Vending machine is available	Yes	Tie-up with local government for dedicated bio-waste handover

Table 6: Details of the waste management practices adopted by the team

5.3   Water Audit

Water is one of the basic needs. Pure drinking water is a resource that needs to be preserved efficiently. A water audit helps to identify the sources of water consumption, and the water requirement by the premises is met by these sources. The effective usage of water without any wastage should be a mandatory practice. Understanding the techniques as per site context to increase water conservation in terms of awareness and practice can be identified and executed as part of this exercise.

5.3.1   Water availability and consumption

5.3.1.1   Source of Primary water supply

The Institute requires water from the Local Municipality for drinking water purposes. **There are dedicated water tanks as overhead tank facilities available in the premises.**

5.3.1.2   Source of Secondary water supply

The Institute uses the following sources of water supply for secondary usages such as watering plants, kitchen, toilets, and wash basins and other spaces. **There are 2 bore wells available at present.**

5.3.1.3   Source of Tertiary water supply

The tertiary source of water is **the source of water harvesting; the project at present is practiced through DEDICATED PITS in 6 nos. in the premises.** *The team has suggested connecting the overflow pipe to the bore well for ground water recharging.*

5.3.1.4   Source of Reusing waste water

This initiative is not practiced at present. Since the campus **is located in SHARED premises,** the system is not an urgent requirement.

5.3.2 Areas of water usage

Based on the inventory done and data shared by the staff it was found that the premise has the facilities such as water cooler, toilets, washbasins etc.

5.4   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.

5.4.1 Facilities available

The Institution has washroom facility, hand wash, drinking water and dustbin facilities.

5.4.2 Hygiene aspects

The team should undertake steps to upgrade the hygiene areas of the site as per the instructions and discussion.

6. Suggestions

Section-wise suggestions related to premises

The following suggestions are to be considered as a *__first priority__* for implementation. These **should be executed within the next 2.5 years** from the date of the Report submission. The Institute can execute a plan after discussion with Project Head.

6.1   Green practices Audit

- **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.

- **Environmental awareness -** There can be various slogans in local and national lanuage 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 in the premises -** The Institute can adopt the One Faculty – One tree adoption scheme; this can be practiced on occasions such as toppers meet, guest sapling plantations, specific zoning of the tree adoption area. this can be very beneficial, especially during the summer season.

- **No vehicle day -** Once in a while, a No vehicle day can be adopted by students and staff to promote the use of eco-friendly vehicles on the premise.

- **Undertake environment study of local areas** – This aspect is w.r.t. environmental parameters and submits the same to local municipality for further up gradations.

- **Increase the organic farming practices -** The premises can have an organic farming facility in terms of farms, kitchen, terrace gardens the produce can be directly utilised in the premises.

6.2   Waste Audit

⮞ **Signages -** Messages about avoiding wastage should be placed at appropriate locations.

⮞ **Material of dustbin -** The plastic dustbins should be replaced with eco-friendly material.

⮞ **Documentation** – Improve and increase the documentation and visibility/ reflectance of the environment related events on the website, social media handles

⮞ **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.

6.3   Water Audit

⮞ **Waterless urinals -** There can be the provision of waterless urinals as a Green Building initiative in the premise, either the existing ones can be replaced with such a facility or new toilets can be constructed in this manner.

⮞ **Rain water bunds –** There should be landscape beautification project undertaken to appropriate channelize the rain water through bunds and similar facilities.

6.4   Health and Hygiene Audit

⮞ **Health related provisions** – There should be provisions for a dedicated health centre and 24x7 available ambulance services inside the premises.

⮞ **Signboards** – The Institute should have multiple signboards about 'No smoking' and 'Healthy premises' at every nook and corner of the Institute.

⮞ **Compound wall** – The compound wall should have awareness messages about 'No Smoking' and 'No Tobacco'

⮞ **Toilet hygiene** – There should be facilities such as potpourri, camphor tablets in the toilet to avoid smell and health related issues.

Evidence of the visit - group photo with the core team

Investigative parameters – Ecological Aspects – Nursery in the premises and sapling plantation

Investigative parameters – Site Aspects – E-waste bin, Campus and batteries for backup

Investigative parameters – *Outdoor areas of premises*

7. Compilation

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.

➲ 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

➲ 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

➲ Images on site by Coordinators of the both teams

➲ Icon images used by https://www.vecteezy.com/free-vector/security-camera-icon and https://www.vecteezy.com/free-vector/electric-car-icon