

ENVIRONMENT AUDIT

STUDY PERIOD (TWO YEARS) 2022 – 2023 & 2023 - 2024

Sustainability study
AUDIT REPORT

Studied for
**Anekant Education Society's
Jaysingpur College, Jaysingpur**
Shirolwadi road, Jaysingpur 416101,
Maharashtra

Studied in the capacity of
Accredited and Certified GBP



Website: <https://thegreenviosolutions.co.in/>

Email: greenviosolutions@gmail.com

Disclaimer

The Audit Team has prepared this report for the **Anekant Education Society's Jaysingpur College, Jaysingpur** located Shirolwadi road, Jaysingpur 416101, Maharashtra 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.

Ar. Nahida Abdulla

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

The Audit Assessment Team extends its appreciation to the **Anekant Education Society's Jaysingpur College, Jaysingpur** 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 to everyone from the Management.

Our heartfelt thanks are extended to the Chairperson of the entire process **Dr. S.A. Manjare**, (Principal) for the valuable inputs.

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

- Teaching staff member – **Dr.R.S.Dhabbe**, Assistant Professor, Department of Chemistry
- Non-teaching staff member – **Mr. Nemminath Magdum and Mr. Satish Mangave**
- Admin staff member - **Mr. A.B. Kambale (OS) and Mr. Sanjay Chavare (Head Clark)**

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

Disclaimer	1
Acknowledgement	2
Contents.....	3
1. Introduction.....	4
2. Overview	6
3. Research	7
4. Observation	8
5. Documentation	12
6. Investigation	27
7. Suggestion	29
8. Compilation.....	33

1. Introduction

1.1 About statements of the Institute

1.1.1 Vision

The Institute proposes "To construct the enlightened and humane society through meaningful, value-based and quality education."

1.1.2 Mission

The Institute adheres:

- To create and disseminate the knowledge amongst the students and society through continuous efforts by teaching, learning and research practices at par with the global standards.
- To inculcate the national values of socialism, secularism and democracy to build a society striving for social and economic justice.
- To enhance the employability of the students through use of ICT and various programs of personality development, career counselling, placement cell.

1.2 Assessment of the Institute

The Institute was established in June 1964.

1.2.1 Affiliations

The courses provided by Institute have received affiliation through the **Shivaji University, Kolhapur, Maharashtra**

1.2.2 Certification

AISHE – The All India Survey of Higher Education code is C-11084

1.2.3 Recognitions

The Institute has received recognition by the **section 2(f) and 12(b) of the University Grants Council Act, 1956**

DETAILED REPORT

2. Overview

2.1 Summarised Populace analysis for 2023-2024

2.1.1 Students data

The data (shared by the Institute) shows there were **2,115 students**.

2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	10	03	13
2	Teaching staff	23	08	31
3	Non-Teaching staff	20	00	20
Total Staff Members		53	11	64

Table 1: Staff data of the Institution for 2023-2024

The staff data shows the Institute premises had **64 Staff Members**.

2.2 Summarised Populace analysis for 2022-2023

2.2.1 Students data

The data (shared by the Institute) shows there were **2,532 students**.

2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	11	03	14
2	Teaching staff	22	08	30
3	Non-Teaching staff	19	00	19
Total Staff Members		52	11	63

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

The staff data shows the Institute premises had **63 Staff Members**.

3. Research

3.1 Campus area

The site is spread over 25 acres of land with a built-up area admeasuring 1,75,537 sq. ft.

3.2 About the Green Building Study Audit

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

3.3 Analysis of the Green Building Study Audit

The procedure included detailed verification as follows:

- Investigation
- Technical
- Observations
- Inferences

3.4 Strategy adopted for Green Building Study Audit

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

4. Observation

1 | Page

Evidence documents for Site visit of external audit team


Audit team headed by external expert - Ar. Nahida Abdulla
Accredited & Certified Green Building Professional, ISO IA (IMS)
Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit


Institute: Jaysingpur College, Maharashtra Date: 6 July 2024


Document objective: Inferences of the Site visit

Observations (Positive aspects)	Suggestions (Improvement aspects)
Green Audit	
<ul style="list-style-type: none"> - Rainwater pits (3x5,000lit) & groundwater recharge (1 tube well (6" x 350ft:)) - Compost (vermin) available 	<ul style="list-style-type: none"> - Gradual improvement in every type of waste management could be undertaken
Energy Audit	
<ul style="list-style-type: none"> - 80 kW solar panels available in premises - A single sensor based tap available 	<ul style="list-style-type: none"> - Documentation of facilities - Some places electrical concealing of works can be undertaken
Environment Audit	
<ul style="list-style-type: none"> - Exceptional good green cover & as per testing excellent AQI found 	<ul style="list-style-type: none"> - Signages & boards about spaces with sensitization workshops can be undertaken




PRINCIPAL
Jaysingpur College, Jaysingpur
Signature & Round seal
Name:
Designation:
For the said Institute





GREENVIO SOLUTIONS
Signature & Round seal
Name: Mrs. E. A. Shaikh
Designation: Project Coordinator
For The Greenvio Solutions



Website: thegreenviosolutions.co.in Email: greenviosolutions@gmail.com

Plate 1: Evidence files related to inferences of the site visit

Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla
 Accredited & Certified Green Building Professional, ISO IA (IMS)
 Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit

Institute: Jaysingpur College, Jaysingpur Date: 06.07.2024


Document objective: Proof of the Site visit



Meeting with the core team



Investigation of the systems


PRINCIPAL
 Jaysingpur College, Jaysingpur
 Signature & round seal
 Name:
 Designation:
For the said Institute




GREENVIO SOLUTIONS
 Signature & round seal
 Name: Mrs. A. Shaikh
 Designation: Project Coordinator
For The Greenvio Solutions

Website: thegreenviosolutions.co.in Email: greenviosolutions@gmail.com



Plate 2: Evidence files related to the site visit

Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla
 Accredited & Certified Green Building Professional, ISO IA (IMS)
 Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit

Institute: Jaysingpur College, Jaysingpur Date: 06.07.2024

Document objective: Induction Meeting attendance sheet

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Prof. Dr. T. G. Ghatage	IQAC	COORDINATOR	
4.	Mr. R. D. Shinde	IQAC	co-coordinator	
5.	Dr. R. S. Dhabbe	IQAC	Co-coor (Cvi. 7)	
6.	Dr. P. P. Chikode	IQAC	Adviser	
7.	Dr. V. B. Desai	Green club	coordinator	

PRINCIPAL
 Jaysingpur College, Jaysingpur
 Signature & round seal
 Name:
 Designation:
For the said Institute



GREENVIO SOLUTIONS
 Signature & round seal
 Name: Mrs. F. A. Shaikh
 Designation: Project Coordinator
For The Greenvio Solutions

Website: thegreenviosolutions.co.in Email: greenviosolutions@gmail.com



Plate 3: Evidence file related to induction meeting attendance record

Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla
 Accredited & Certified Green Building Professional, ISO IA (IMS)
 Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit

Institute: Jaysingpur College, Jaysingpur. Date: 06.07.2024

Document objective: Exit Meeting attendance sheet

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Dr. S.G. Patil	IGAC	Member	
4.	Dr. T.G. Chhatase	IGAC	Co-ordinator	
5.	Dr. P.P. Chikode	IGAC	Adviser	
6.	Dr. M.R. Akkole	Local Committee	Secretary	
7.	Dr. S.B. Adgadande	"	Chairman	
8.	Dr. S.A. Manjare	Principal	Principal	
9.	Dr. R.S. Dhabbe	IGAC member	Com. F.	

PRINCIPAL
 Jaysingpur College, Jaysingpur
 Signature & round seal
 Name:
 Designation:
For the said Institute



Signature & round seal
 Name: Mrs. F. A. Shaikh
 Designation: Project Coordinator
For The Greenvio Solutions



Website: thegreenviosolutions.co.in Email: greenviosolutions@gmail.com



Plate 4: Evidence file related to exit meeting attendance record

5. Documentation

5.1 Ecological spaces

There are many green areas in the premises as documented below:



Plate 5: Sericulture spaces



Plate 6: Medicinal plant museum



Plate 7: Biodiversity museum and Bio-information centre



Plate 8: Greenhouse in the premises

The study suggests the site should be designed & boards identifying these spaces as 'BREAKOUT ZONE' and 'GREEN ZONE' more can be displayed around site

5.2 Biodiversity audit

The following documentation is based on the documented study of the site.

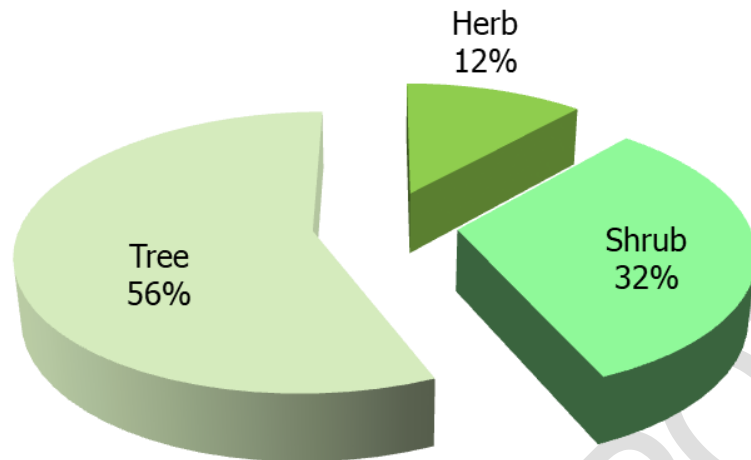


Figure 1: Summary of the flora as per inventory

The above graph shows that trees form 56% whereas the shrub form 32% while the herbs form 12% of the total plantation study. In the above analysis the following plantations are excluded since they are available in infinity.

- *Tagetes erecta L.* - Herb
- *Tridax procumbens L.* - Herb
- *Oxalis corniculata L.* - Herb
- *Tribulus terrestris L.* - Herb
- *Duranta erecta L.* - Shrub
- *Lawsonia alba Lam.* - Shrub
- *Euphorbia geniculata Orteg* – Tree



Plate 9: Green pocket landscapes in the premises



Plate 10: Signages and information displays in the premises

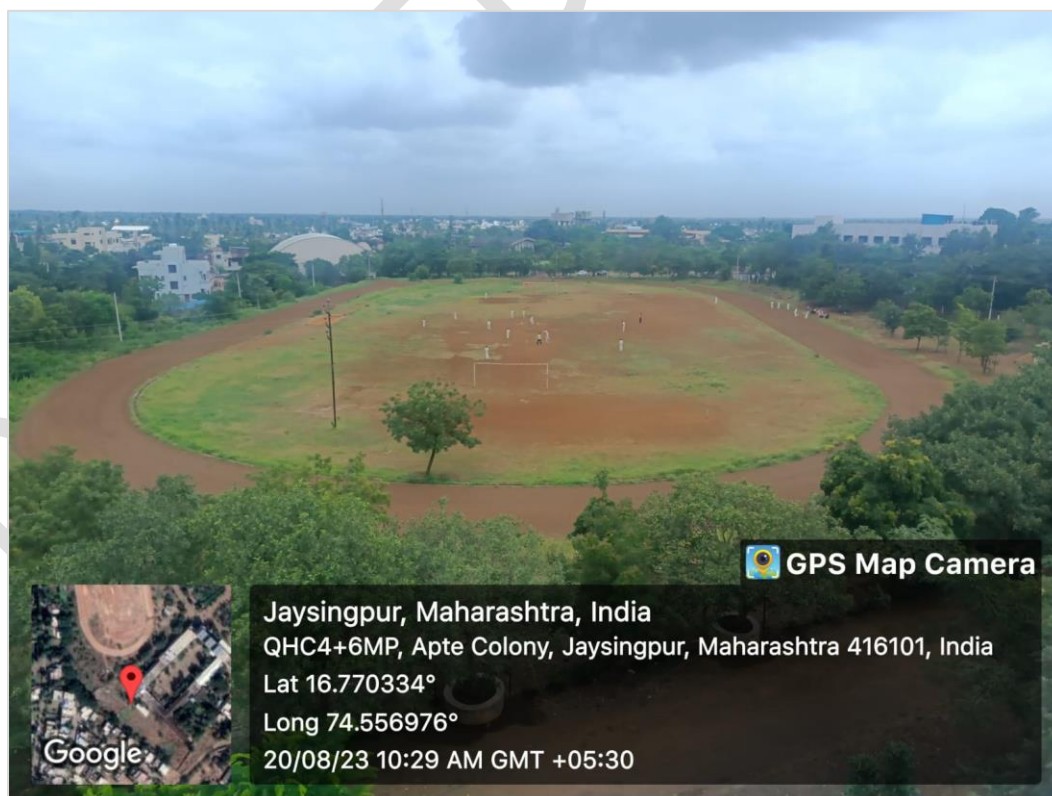


Plate 11: Outdoor stadium with a running track in the premises

5.2.1 Flora audit

A flora survey to identify the total numbers of plants and trees by internal team as documented below displays the verities of the plantations.

S. No.	Plant name	Type	Nos.
1	<i>Andrographis paniculata (Burm. A) Nees</i>	Herb	1
2	<i>Achyranthus aspara L.</i>	Herb	1
3	<i>Crinum species</i>	Herb	4
4	<i>Centella asiatica (L.) Urb</i>	Herb	1
5	<i>Catharanthus roseus (L.) G. Don</i>	Herb	10
6	<i>Hemidesmus indicus (L.) Schult</i>	Herb	3
7	<i>Dieffenbachia seguine (Jacq.) Schott</i>	Herb	1
8	<i>Acorus calamus L.</i>	Herb	2
9	<i>Dypsis lutescens Beentje & deansf</i>	Herb	15
10	<i>Aristolochia ringens Vahl</i>	Herb	10
11	<i>Polianthes tuberosa L.</i>	Herb	3
12	<i>Chlophytum comosom (Thunb.) Jacq.</i>	Herb	2
13	<i>Chlophytum laxum R.Br.</i>	Herb	2
14	<i>Dracaena deremensis Engl.</i>	Herb	1
15	<i>Stevia reboudiana</i>	Herb	1
16	<i>Tagetes erecta L.</i>	Herb	***
17	<i>Tridax procumbens L.</i>	Herb	***
18	<i>Heliotropium indicum L.</i>	Herb	1
19	<i>Selenicereus undatus</i>	Herb	16
20	<i>Epiphyllum oxypetalum (DC.) Haw.</i>	Herb	2
21	<i>Canna indica L.</i>	Herb	2
22	<i>Ipomea carnea L.</i>	Herb	1
23	<i>Costus pictus</i>	Herb	2
24	<i>Bryophyllum pinnatum (Lam.) Oken</i>	Herb	5
25	<i>Kalanchoe laciniata (L.) DC</i>	Herb	4
26	<i>Leucas aspara (Willd.) Link</i>	Herb	1
27	<i>Mentha arvensis (L.)</i>	Herb	2
28	<i>Ocimum bacilum L.</i>	Herb	1
29	<i>Ocimum sanctum Linn</i>	Herb	15
30	<i>Oscimum americanum L.</i>	Herb	6
31	<i>Cinnamomum tamala (Buch.-Ham.) T.Nees & Eberm.</i>	Herb	2
32	<i>Abrus precatoris L.</i>	Herb	1
33	<i>Allium sativum L.</i>	Herb	1

34	<i>Asparagus racemosus Willd.</i>	Herb	5
35	<i>Tinospora sinensis (Lour.) Merr.</i>	Herb	5
36	<i>Nymphoides indicus (L.) Kuntze</i>	Herb	5
37	<i>Syzygium cumini (L.) Skeels</i>	Herb	8
38	<i>Syzygium aromaticum Merrill & perry</i>	Herb	1
39	<i>Syzygiums amarangense Merrill & perry</i>	Herb	1
40	<i>Syzygium aromaticum (L.) Merrill & Perry</i>	Herb	1
41	<i>Boerhavia repens var. diffusa (L.) Hook f.</i>	Herb	1
42	<i>Jasminum grandiflorum L.</i>	Herb	1
43	<i>Ludwigia sedioides (Humb. & Bonpl.) H. Hara</i>	Herb	2
44	<i>Oxalis corniculata L.</i>	Herb	***
45	<i>Passiflora edulis Sims</i>	Herb	2
46	<i>Piper betle L.</i>	Herb	2
47	<i>Portulaca oleracea L.</i>	Herb	2
48	<i>Solanum virginianum L.</i>	Herb	2
49	<i>Verbena hybrida Groenl. & Rumpler</i>	Herb	10
50	<i>Cissus quadrangifolia L.</i>	Herb	2
51	<i>Aloe vera (L.) Burm.f.</i>	Herb	10
52	<i>Curcuma longa L.</i>	Herb	2
53	<i>Elettaria cardamomum (L.) Maton.</i>	Herb	1
54	<i>Tribulus terrestris L.</i>	Herb	***
55	<i>Ruellia sps.</i>	Shrub	2
56	<i>Justicia adhatoda L.</i>	Shrub	3
57	<i>Barleria cristata L.</i>	Shrub	2
58	<i>Barleria involucrata var. elata (Dalzell) C.B. Clarke</i>	Shrub	3
59	<i>Barleria prionitis L.</i>	Shrub	2
60	<i>Crossandra infundibuliformis (L.) Nees</i>	Shrub	2
61	<i>Annona squamosa L.</i>	Shrub	8
62	<i>Nerium oleander L. (Yellow)</i>	Shrub	5
63	<i>Nerium oleander L. (Pink)</i>	Shrub	4
64	<i>Nerium oleander L. (White)</i>	Shrub	5
65	<i>Calotropis gigantea (L.) Dryand.</i>	Shrub	2
66	<i>Calotropis procera (Ait.) R. Br.</i>	Shrub	1
67	<i>Carissa carandus L.</i>	Shrub	2
68	<i>Holarrhena pubescens Wall. Ex G. Don</i>	Shrub	1
69	<i>Rouvolfia serpentina (L.) Kurz.</i>	Shrub	4
70	<i>Impatians balsamina L.</i>	Shrub	2
71	<i>Tecoma stans (L.) Juss. ex Kunth</i>	Shrub	2

72	<i>Bixa orellana L.</i>	Shrub	1
73	<i>Caparis species</i>	Shrub	4
74	<i>Clerodendrum thomsoniae Balf. f.</i>	Shrub	3
75	<i>Dichrostachys cinerea Brenen & Brummit</i>	Shrub	3
76	<i>Leucaena leucocephala (Lam.) de Wit</i>	Shrub	13
77	<i>Senna siamea (Lam.) H.S. Irwin & Barneby</i>	Shrub	5
78	<i>Prosopis cineraria (L.) Druce</i>	Shrub	4
79	<i>Acacia concinna (Willd.) DC</i>	Shrub	2
80	<i>Saraca asoka (Roxb.) Willd</i>	Shrub	2
81	<i>Punica granatum L.</i>	Shrub	3
82	<i>Cuphea ignea A.DC.</i>	Shrub	1
83	<i>Cuphea ignea A.DC.</i>	Shrub	1
84	<i>Hiptage benghalensis (L) Kurz.</i>	Shrub	1
85	<i>Hibiscus rosa-sinensis L.</i>	Shrub	2
86	<i>Abelmoschus moschatus Medik.</i>	Shrub	1
87	<i>Helicterus isora L.</i>	Shrub	1
88	<i>Azadirachta indica A.Juss.</i>	Shrub	73
89	<i>Myristica fragrans</i>	Shrub	1
90	<i>Bougainvillea spectabilis Willd.</i>	Shrub	5
91	<i>Bougainvillea spectabilis Willd.</i>	Shrub	10
92	<i>Jasminum sambac (L.) Aiton</i>	Shrub	4
93	<i>Jasminum auriculatum Vahl</i>	Shrub	1
94	<i>Nyctanthus arbor-tritis</i>	Shrub	1
95	<i>Sauropus adndrogynus (L.) Merrill</i>	Shrub	1
96	<i>Russelia equisetiformis Schltld. & Cham.</i>	Shrub	2
97	<i>Plumbago zeylanica L.</i>	Shrub	50
98	<i>Dendrocalamus strictus (Roxb.) Nees</i>	Shrub	5
99	<i>Crysopogon zizinoides (L.) Roberty</i>	Shrub	1
100	<i>Cymbopogon aromaticum Watson</i>	Shrub	2
101	<i>Cymbopogon citrates (DC) Stapf.</i>	Shrub	3
102	<i>Dendrocalamus asper Baker ex. Heyne</i>	Shrub	2
103	<i>Dendrocalamus stockssi K. M. Kumar & Unnikr.</i>	Shrub	10
104	<i>Naravelia zeylanica (L.) DC.</i>	Shrub	1
105	<i>Ziziphus mauritiana Lam.</i>	Shrub	3
106	<i>Rosa indica L.</i>	Shrub	4
107	<i>Ixora Sps.</i>	Shrub	11
108	<i>Coffea arabica L.</i>	Shrub	2
109	<i>Hamelia patens Jacq.</i>	Shrub	2

110	<i>Ixora Sps. (White)</i>	Shrub	1
111	<i>Ixora Sps. (Singapur)</i>	Shrub	15
112	<i>Pentas lanceolata (Forssk.) Deflers (Pink)</i>	Shrub	15
113	<i>Pentas lanceolata (Forssk.) Deflers (Red)</i>	Shrub	10
114	<i>Spermadictyonsu aveolens Roxb</i>	Shrub	1
115	<i>Citrus maxima (Burm.) Men.</i>	Shrub	2
116	<i>Citrus limon (L.) Osbeck</i>	Shrub	6
117	<i>Cestrum nocturnum L.</i>	Shrub	1
118	<i>Withania somnifera</i>	Shrub	3
119	<i>Duranta erecta L.</i>	Shrub	***
120	<i>Premna integrifolia Willd.</i>	Shrub	3
121	<i>Lantana camara L.</i>	Shrub	115
122	<i>Stachytarpheta cayennensis (Rich.) Vahl (Purple)</i>	Shrub	10
123	<i>Stachytarpheta cayennensis (Rich.) Vahl (Red)</i>	Shrub	15
124	<i>Lawsonia alba Lam.</i>	Shrub	***
125	<i>Vitex nigundo L.</i>	Shrub	1
126	<i>Vitis vinifera L.</i>	Shrub	5
127	<i>Hedychium coronarium J.Koenig</i>	Shrub	5
128	<i>Anacardium occidentale L.</i>	Tree	1
129	<i>Mangifera indica L.</i>	Tree	2
130	<i>Mangifera indica (Alphonso)</i>	Tree	1
131	<i>Mangifera indica (Amrapali)</i>	Tree	1
132	<i>Mangifera indica (Chandrama)</i>	Tree	1
133	<i>Mangifera indica (Dsheri)</i>	Tree	1
134	<i>Mangifera indica (Dudhpeda)</i>	Tree	1
135	<i>Mangifera indica (Fernandin)</i>	Tree	1
136	<i>Mangifera indica (Goa mankur)</i>	Tree	1
137	<i>Mangifera indica (Karel)</i>	Tree	1
138	<i>Mangifera indica (Keitt)</i>	Tree	1
139	<i>Mangifera indica (Kensington)</i>	Tree	1
140	<i>Mangifera indica (Kent)</i>	Tree	1
141	<i>Mangifera indica (Kesar)</i>	Tree	1
142	<i>Mangifera indica (Kingfon)</i>	Tree	1
143	<i>Mangifera indica (Kokanruchi)</i>	Tree	1
144	<i>Mangifera indica (Lily)</i>	Tree	1
145	<i>Mangifera indica (Mallika)</i>	Tree	1
146	<i>Mangifera indica (Nilam)</i>	Tree	1
147	<i>Mangifera indica (Palmar)</i>	Tree	1

148	<i>Mangifera indica (Payri)</i>	Tree	1
149	<i>Mangifera indica (Ratna)</i>	Tree	1
150	<i>Mangifera indica (Shehar)</i>	Tree	1
151	<i>Mangifera indica (Sindhu)</i>	Tree	1
152	<i>Mangifera indica (Suvernarekha)</i>	Tree	1
153	<i>Mangifera indica (Tomi Atkins)</i>	Tree	1
154	<i>Mangifera indica (Totapuri)</i>	Tree	1
155	<i>Mangifera indica (Vanraj)</i>	Tree	1
156	<i>Semecarpus anacardium L. f.</i>	Tree	1
157	<i>Polyalthia longifolia (Sonn.) Thwaites</i>	Tree	15
158	<i>Artabotrys hexapetalus (L. f.) Bhandari</i>	Tree	5
159	<i>Annona reticulata L.</i>	Tree	2
160	<i>Alstonia scholaris (L.) R.Br.</i>	Tree	29
161	<i>Plumeria alba L. (Yellow)</i>	Tree	2
162	<i>Plumeria alba L. (White)</i>	Tree	2
163	<i>Gymnema sylvestris R. Br.</i>	Tree	1
164	<i>Tabernaemontana alternifolia (Roxb.) Nicols & Suresh</i>	Tree	1
165	<i>Tylophora indica (Burm.f.) Merr.</i>	Tree	1
166	<i>Araucaria columnaris (G.Forst.) Hook.</i>	Tree	2
167	<i>Archontophoenix alexandrae (F.Muell.) H. Wendl. & Drude</i>	Tree	1
168	<i>Arecacatechu L.</i>	Tree	4
169	<i>Cocos nucifera L.</i>	Tree	2
170	<i>Tabebuia aurea (Silva Manso) Benth. & Hook.f. ex S. Moore</i>	Tree	2
171	<i>Millingtonia hortensis L. f.</i>	Tree	5
172	<i>Spathodea campanulata P. Beauv.</i>	Tree	4
173	<i>Jacrandia acutifolia Humb.</i>	Tree	2
174	<i>Kigelia africana (Lam) Benth.</i>	Tree	2
175	<i>Oroxylum indicum (L.) Kurz.</i>	Tree	1
176	<i>Steropermum chelonoides DC.</i>	Tree	1
177	<i>Tabobia rosea DC.</i>	Tree	2
178	<i>Cordia dichotoma G. Froster</i>	Tree	1
179	<i>Commiphora wightii (Arn.) Bhandari</i>	Tree	1
180	<i>Mesua ferrea L.</i>	Tree	4
181	<i>Carica papaya L.</i>	Tree	2
182	<i>Garcinia indica (Thouars) Choisy</i>	Tree	2
183	<i>Terminalia catappa L.</i>	Tree	12

184	<i>Terminalia bellirica (Gaertn.) Roxb.</i>	Tree	3
185	<i>Terminalia arjuna (Roxb. ex DC.) Wight & Arn.</i>	Tree	10
186	<i>Combretum indicum (L.) DeFilipps</i>	Tree	2
187	<i>Terminalia chebula Retz.</i>	Tree	1
188	<i>Terminalia elliptica Willd.</i>	Tree	1
189	<i>Terminalia paniculata Roth</i>	Tree	1
190	<i>Cycas revoluta Thunb</i>	Tree	2
191	<i>Dispyrus melanoxyllum Roxb.</i>	Tree	1
192	<i>Elaeocarpus angustifolius Blume</i>	Tree	2
193	<i>Jatropha gossypifolia L.</i>	Tree	17
194	<i>Ricinus communis L.</i>	Tree	5
195	<i>Jatropha curcas L.</i>	Tree	2
196	<i>Euphorbia geniculata Orteg</i>	Tree	***
197	<i>Mallotus philippensis (Lam.) Mull Arg</i>	Tree	5
198	<i>Phyllanthus officinalis (L.)</i>	Tree	2
199	<i>Nothopodytis nimoniana (Grahm)</i>	Tree	1
200	<i>Tectona grandis L. f.</i>	Tree	7
201	<i>Gmelina arborea Roxb.</i>	Tree	1
202	<i>Peltophorum pterocarpum (DC.) K. Heyne</i>	Tree	41
203	<i>Tamarindus indica L.</i>	Tree	14
204	<i>Gliricidia sepium (Jacq.) Walp.</i>	Tree	10
205	<i>Albizia saman (Jacq.) Merr. Syn: Samaneasaman (Jacq.) Merr.</i>	Tree	26
206	<i>Parkia biglandulosa Wight & Arn.</i>	Tree	5
207	<i>Pongamia pinnata (L.) Pierre</i>	Tree	29
208	<i>Dalbergia sissoo DC.</i>	Tree	15
209	<i>Sesbania sesban (L.) Merr.</i>	Tree	10
210	<i>Delonix regia (Hook.) Raf.</i>	Tree	28
211	<i>Bauhinia variegata L.</i>	Tree	8
212	<i>Mitragyna parvifolia (Roxb.) Korth.</i>	Tree	8
213	<i>Pithecellobium dulce (Roxb.) Benth.</i>	Tree	2
214	<i>Cassia fistula L.</i>	Tree	9
215	<i>Murraya paniculata (L.) Jack</i>	Tree	1
216	<i>Caesalpinia pulcherrima (L.) Sw.</i>	Tree	22
217	<i>Senna tora (L.) Roxb.</i>	Tree	6
218	<i>Acacia auriculoformis Cunn ex. Benth</i>	Tree	1
219	<i>Bauhinia recemosa Lam.</i>	Tree	1
220	<i>Butea monosperma(Lam.) Kuntze</i>	Tree	2

221	<i>Caesalpinia bonduc (L.) Roxb.</i>	Tree	1
222	<i>Cassia surattensisBurm. F.</i>	Tree	1
223	<i>Leucaena latisiliqua (L.) Gillis</i>	Tree	5
224	<i>Pterocarpus marsupium Roxb</i>	Tree	4
225	<i>Lagerstroemia reginae Roxb.</i>	Tree	1
226	<i>Lagerstroemia speciosa (L.) Pers.</i>	Tree	2
227	<i>Magnolia champaca (L.) Baill. ex Pierre</i>	Tree	5
228	<i>Ceiba pentandra (L.) Gaertn.</i>	Tree	1
229	<i>Sterculia foetida L.</i>	Tree	5
230	<i>Bombax ceiba L.</i>	Tree	1
231	<i>Adansonia digitata L.</i>	Tree	1
232	<i>Thespesia populnea Correa.</i>	Tree	2
233	<i>Memecylon umbellatumBurm.f</i>	Tree	1
234	<i>Swietenia mahagoni (L.) Jacq.</i>	Tree	10
235	<i>Khaya senegalensis (Desv.) A.Juss.</i>	Tree	2
236	<i>Ficus amplissima Sm.</i>	Tree	21
237	<i>Ficus hispida L. f.</i>	Tree	10
238	<i>Ficus benghalensis L.</i>	Tree	25
239	<i>Ficus religiosa L.</i>	Tree	16
240	<i>Ficus carica L.</i>	Tree	2
241	<i>Artocarpus hirsutus Lam.</i>	Tree	1
242	<i>Artocarpus heterophyllus Lam.</i>	Tree	1
243	<i>Morus alba L.</i>	Tree	200
244	<i>Artocarpus altilis Fosberg.</i>	Tree	2
245	<i>Muntingia calabura L.</i>	Tree	1
246	<i>Eucalyptus globulus Labill.</i>	Tree	5
247	<i>Callistemon brachyandrus Lindl.</i>	Tree	5
248	<i>Psidium guajava L.</i>	Tree	3
249	<i>Pimenta dioca Merrill</i>	Tree	1
250	<i>Averrhoa carambola L.</i>	Tree	1
251	<i>Phyllanthus emblica L.</i>	Tree	5
252	<i>Phyllanthus acidus (L.)</i>	Tree	1
253	<i>Grevillea robusta A. Cunn. ex R.Br.</i>	Tree	34
254	<i>Putranjiva roxburghii Wall.</i>	Tree	1
255	<i>Neolamarckia cadamba (Roxb.) Bosser</i>	Tree	3
256	<i>Morinda citrifolia L.</i>	Tree	1
257	<i>Murraya koenigii (L.) Spreng.</i>	Tree	4
258	<i>Limonia acidissima Groff</i>	Tree	3

259	<i>Aegle marmelos (L.) Corrêa</i>	Tree	3
260	<i>Santalum album L.</i>	Tree	23
261	<i>Sapindus trifoliatus L.</i>	Tree	2
262	<i>Mimusops elengi Bojer</i>	Tree	9
263	<i>Madhuca indica J.f. Gmel.</i>	Tree	1
264	<i>Manilkara hexandra (Roxb.) Dubard</i>	Tree	3
265	<i>Manilkara zapota (L.) P. Royan</i>	Tree	2
266	<i>Alianthus excels Roxb.</i>	Tree	4
267	<i>Simarouba glauca DC.</i>	Tree	2
268	<i>Cestrum diurnum L.</i>	Tree	2
269	<i>Gauzuma ulmifolia Lam.</i>	Tree	1
270	<i>Ravenala madagascariensis Sonn.</i>	Tree	1
271	<i>Rotha serrata (L.) Steane & Mabb.</i>	Tree	1

Table 3: Details of the Flora in the premises

5.2.2 Fauna audit

The information provided is noted below:

Fauna available	Names
Birds	<i>Black shouldered kite, Long tailed shrike, Tricoloured Munia, Indian Koel, Jacobin cuckoo, Black Drongo, Scaly breasted Munia, Crested Lark, House Crow, Common Myna, Magpie Robin, Pied Bushchat, Baya Weaver bird, Indian Roller, Common Hoopoe, Brahminy Starling, Green Bee eater, Purple Sunbird, Coppersmith Barbet, White browed flycatcher, Red wattled Lapwing,, Ashy Prinia, Brahminy Kite, Small Minivet, Grey Hornbill, House sparrow, Greater Coucal, Red vented Bulbul, Yellow wattled Lapwing</i>
Insects	<i>Common Banded Awl, Grass Demon, Zebra Blue, Common Cerulean, Red Pierrot, Stripped Tiger, Plain Tiger, Blue Tiger, Common Crow, Black Rajah, Tawny coster, Common Baron, Common Caster, Angled Caster, Blue Pansy, Chocolate Pansy, Peacock Pansy, Lemon Pansy, Great Eggfly, Daniad Eggfly, Common Grass yellow, Mottled Emigrant, Common Emigrant, Common Wanderer, Common Gull, Common Jezebel, Common Jay, Common Mormon, Blue Mornon, Lime Butterfly, Common Rose, Crimson Rose and Honey Bee</i>
Invertebrates	-
Reptiles	<i>Garden Lizard, Spectacle Cobra, Common Rat Snake, Green Keelback</i>
Amphibians	<i>Indian Bull frog</i>
Mammals	<i>Rat, Three stripped squirrel</i>

Table 4: Details of the fauna in the premises

5.4 Noise Audit

The following results are based on the investigation carried out during the site visit.

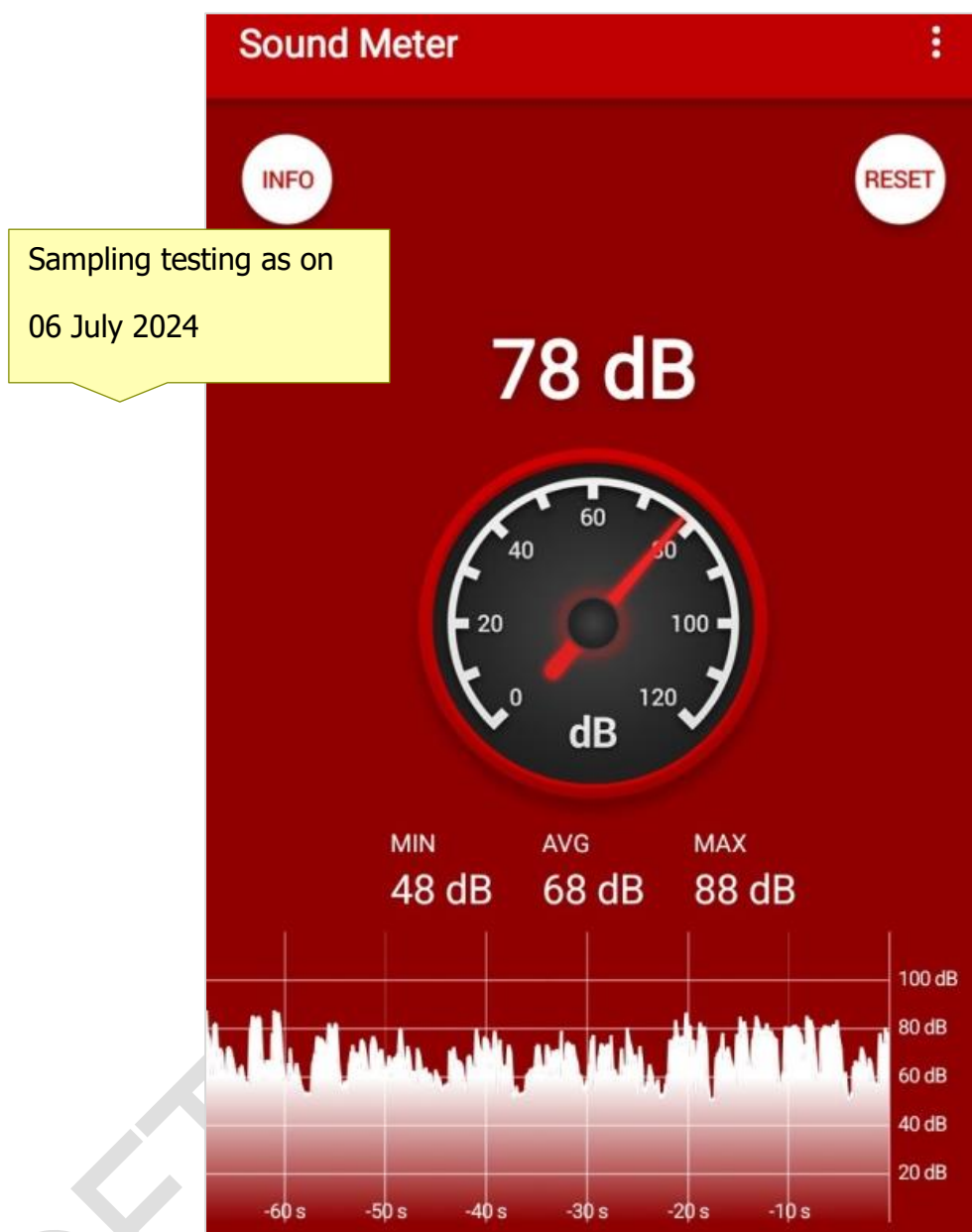


Figure 2: Sound parameters investigation study

As per Indian standards the desirable noise pollution for educational institutions and hospitals in daytime is 50 dbA, with technical reference from the research paper.

(Ref: <https://iopscience.iop.org/article/10.1088/1755-1315/80/1/012053/pdf#:~:text=As%20per%20Indian%20standards%20the,in%20daytime%20is%2050%20dbA.>)

However the average level is 68dB and actual level 78dB; this can be improved with certain measures.

5.5 Carbon Footprint Audit

5.5.1 Eco-friendly Commuting Practices

- The site is located in a rural locality.
- After a certain point, vehicles are not allowed.



Plate 12: No vehicle zone of the premises

The study suggests to include display boards about the no vehicle practice and to improvise it further by diaplying area bifuctaions about:

- 1. No carbon vehicles - Cycles***
- 2. E-vehicles***
- 3. Carbon vehicles – Diesel, CNG, etc.***

5.5.2 Heat Island Reduction

The heat island effect refers to the study of micro climatic feature within a site. There are multiple factors that add on to the feature such as external temperature, internal temperatures, site context including available and site adjacent facilities. The shaded areas (Due to the built space and green cover) add to low heat island effects of campus:

There are huge areas covered in plantations providing a good micro-climate of site.



Plate 13: Light colored roof in the premises

The study suggests no major changes required in this aspect.

5.5.3 Outdoor Light Pollution Study

The campus is located in an urban area however this phenomena was not majorly experienced.

The study suggests that the Institute can undertake sensitization program related to the subject.

6. Investigation

6.1 About AQI

The Air Quality Index (AQI) is used for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health affects you may experience within a few hours or days after breathing polluted air.

The reference for the above data is <https://www.weather.gov/safety/airquality-aqindex>

6.2 AQI Basics for Ozone and Particle Pollution

As per the research of AirNow Organization following are details of the AQI STUDY.

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Table 5: AQI Basics for Ozone and Particle Pollution

The reference for the above data is <https://www.airnow.gov/aqi/aqi-basics/#:~:text=AQI%20values%20at%20or%20below,is%20divided%20into%20six%20categories.>

6.3 Micro-site study

The following results are based on the investigation carried out during the site visit.

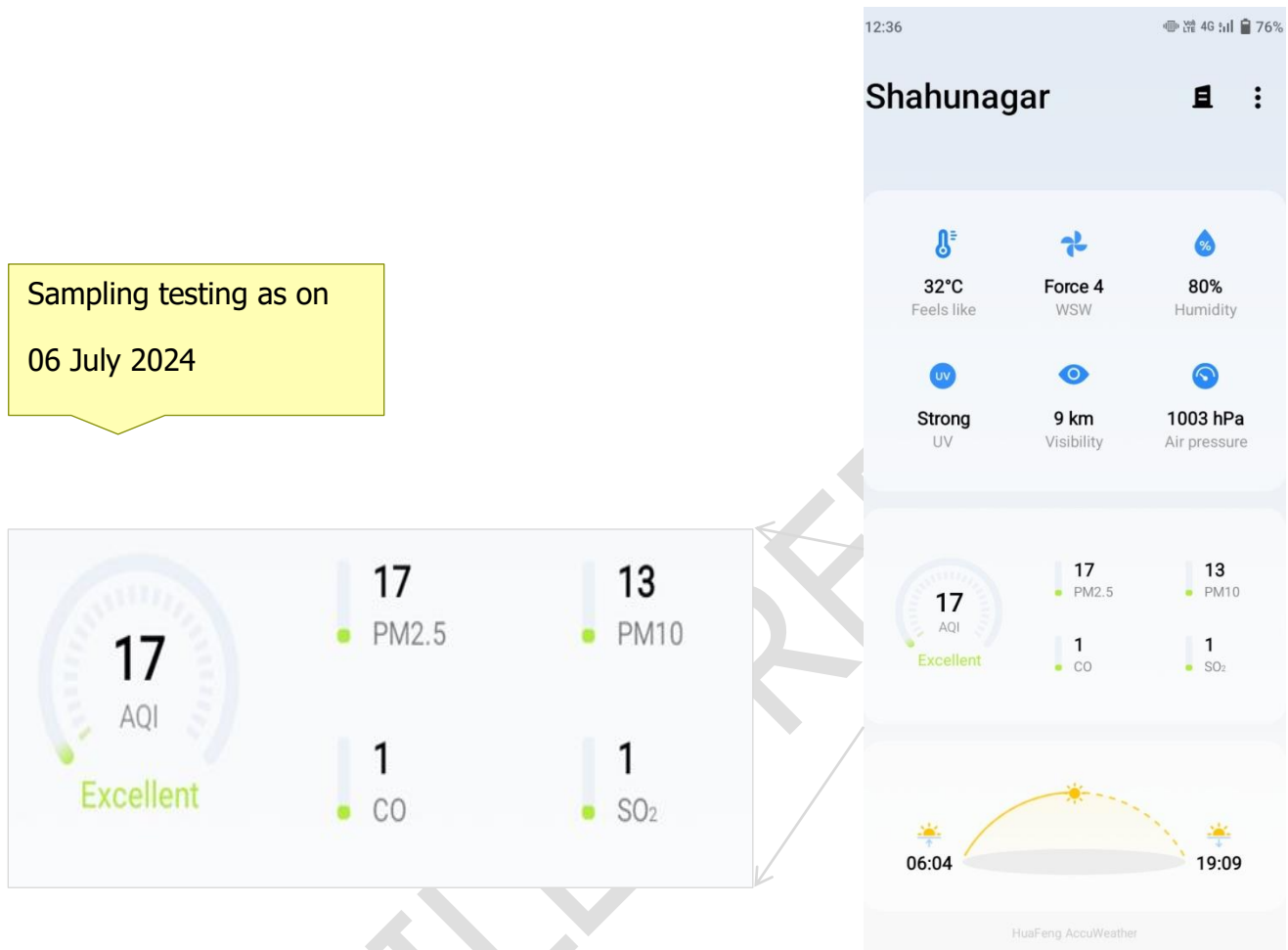


Figure 3: Environmental parameters investigation study

The application HuaFeng AccuWeather was used to analyse the parameters of Air Quality Index (AQI) of the micro-site, the details are noted below:

- Micro-climate temperature of site – 32°C
- Time of the testing – Afternoon 12:36 pm
- Particulate matter 2.5 micrometres or less in diameter (PM_{2.5}) – 17
- Particulate matter 10 micrometres or less in diameter (PM₁₀) – 13
- Carbon Monoxide (CO) – 1
- Sulphur dioxide (SO₂) – 1
- As per the application the AQI was 17 and found to be excellent

7. Suggestion

The suggestion (inference) would act as a 'PLAN OF ACTION' to implement all the suggestions in a detailed manner.

➔ Phase 1

- Duration: One year from the date of Report submission – Shared currently
- These are first hand suggestions
- They are easy and quick to implement
- They involve close very less or almost no expenses
- They can serve as a foundation for the entire plan of action

Section 1 – Eco-restoration of outdoors (Landscape perspective)

➔ Feeders

- At appropriate locations there can be provisions for drinking water and some grains for birds as they visit the site much frequently.

➔ Numbering the plantations in the premises

- Make a list of all the plantations in the premises
- Secondly, start numbering the plantations in either of the ways:
 - i. Painting the nos. on iron plates and nailing the same
 - ii. Printing the nos. on paper, laminating and pasting the same
 - iii. Painting the nos. with letters and nos. directly
- Care should be taken that the display should be visible
- Uniform color palette should be identified and used
- Measures should be taken to avoid withering during monsoon
- This could be undertaken as a student activity



Reference suggestions 1: Numbering the plantations

➔ Improve the ecological footprint of the premises

- Undertake the landscape ecological redesign to increase green cover
- Opportunity can be explored to have a dedicated:
 - i. Organic farm
 - ii. Kitchen garden in backyard

➔ Plant as an extension of 'Green motto'

- External resource persons visiting the premises can share the goal of green environment in the following ways:
 - i. Plant a sapling within the premises
 - ii. Handover a sapling as a gesture

➔ Nutrition pits

- Certain pits (mound of earth covered in green grass/ shrubs) can be demarcated as 'Nutrition pits' where the organic food from the kitchen and Canteen fruit peels and fruits or vegetables can be degraded for making nutrition-rich soil.

Section 2 – Documentation

➔ Messages on the beam area

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

➔ Awareness

- Introduce zone wise display boards at relevant locations

Section 3 – Amenities

➔ Facilities

- Speed limit signage
- Speed breakers
- Zebra crossing
- First aid box near the administrative area
- Suggestion box every floor of the premises

Section 4 – Environmental management systems

➔ Noise pollution measures

- Adding rugs to bare floors to act as noise barriers
- Introduce hanging curtains over windows to act noise barriers
- Display signboard in outdoor areas of campus highlighting 'Silent zone' and 'No honking zone'
- Encourage the use of electric vehicles to reduce traffic noise
- Educate and raise awareness through program and promote quiet zone
- Plant more trees as they are good noise absorbents and act as natural sound buffers additionally according to studies, it can reduce noise by 5 to 10 decibels dB around them

➔ Heat island control measures

○ Cool rooftops

- i. Terrace rooftops can be painted with Cooltop (Reflective material) to reflect the harsh sun rays and reduce the heat absorption in the top most floor and surrounding areas of the building.
- ii. Introduce signboards about 'No students are allowed to enter'
- iii. Undertake feasibility study of before - after temperature reading.

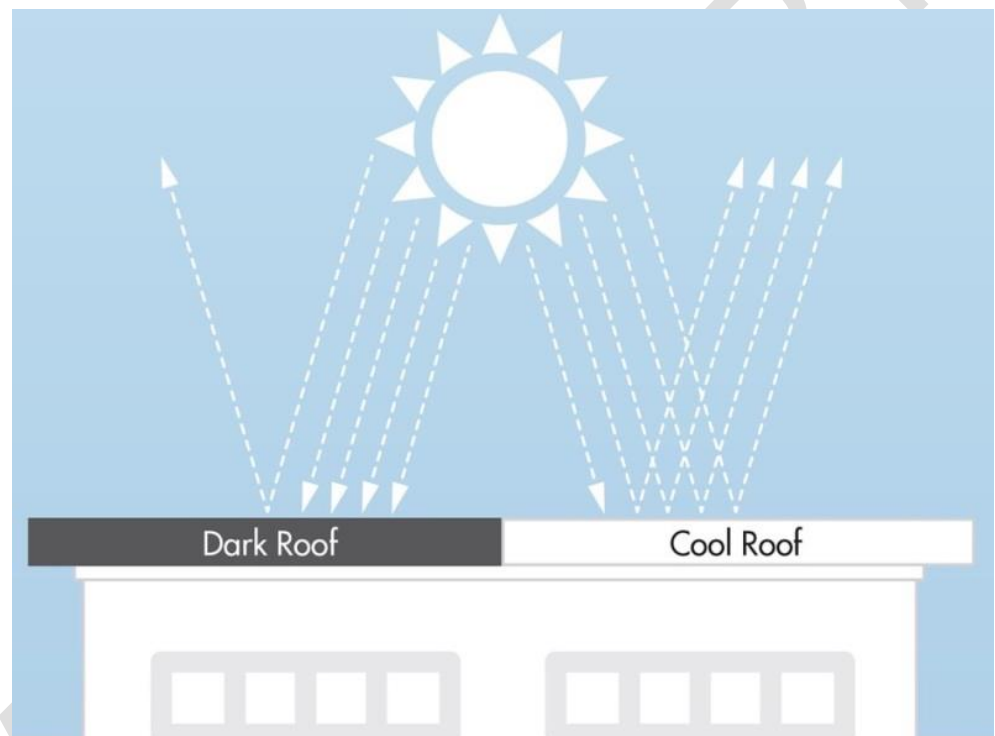


Plate 14: Cool roof comparative analysis (For reference purpose only)

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

➔ Pollution control measures

- Vehicle usage - Restricting the speed limit of vehicles on the premises to 10 km per hour, not honking on the premises will help in maintaining the sound in control and emphasis on a silent zone.
- Avoid burning waste - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff

8. 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.

National references

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

International references

- ➔ The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- ➔ Streetscape elements – Chapter 6 on San Francisco
- ➔ American lung association <https://www.lung.org/>
- ➔ Study related to air pollution <https://www.airgle.com/>
- ➔ Exploring the light pollution <https://education.nationalgeographic.org/>
- ➔ Urban heat island effect <https://www.epa.gov/heatislands/what-you-can-do-reduce-heat-islands>

Investigation study references

- ➔ <https://www.airnow.gov/aqi/aqi-basics/#:~:text=AQI%20values%20at%20or%20below,is%20divided%20into%20six%20categories.>
- ➔ <https://www.weather.gov/safety/airquality-aqindex>
- ➔ <https://iopscience.iop.org/article/10.1088/1755-1315/80/1/012053/pdf#:~:text=As%20per%20Indian%20standards%20the,in%20day time%20is%2050%20dbA.>
- ➔ <https://www.ppsthane.com/blog/how-to-reduce-noise-pollution>

