Environment Audit

Study Period (One Year) 2023 - 2024

Sustainability study

AUDIT REPORT

Studied for

Rayat Shikshan Sanstha's,

Annasaheb Awate Arts, Commerce and Hutatma Babu Genu Science College, Manchar

Post-Manchar, Tal. Ambegaon, Dist. Pune.

Pin code- 410 503, Maharashtra

Studied in the capacity of

Accredited and Certified

Green Building Professional

Studied by

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

Email: greenviosolutions@gmail.com

Disclaimer

The Audit Team has prepared this report for **Rayat Shikshan Sanstha's Annasaheb Awate Arts, Commerce and Hutatma Babu Genu Science College, Manchar** located at *Post-Manchar, Tal. Ambegaon, Dist. Pune Pin code- 410 503, 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 **Rayat Shikshan Sanstha's Annasaheb Awate Arts, Commerce and Hutatma Babu Genu Science College, Manchar, 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.

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

Sustainable Academe
Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

1. Introduction

1.1 About the Institution

1.1.1 Vision

The Institute proposes *"Education for masses is principal instrument and the tool for eradication of all pervasive social evils and desirable effective social change. Education through self-help is a significant and chief drive of social change to achieve different tasks of nation building by establishing social equality and social justice."*

1.1.2 Mission

The Institute's information includes:

- *To import higher Education through the University formal courses and non-traditional self financing and short term courses*
- *By imparting higher education for the upliftment of the backward, the depressed, and the underprivileged and tribal communities of the region*
- *To inculcate values and virtues among the students as mentioned the aims and the objectives of the college.*

2. Overview

2.1 Summarised Populace analysis for 2023-24

2.1.1 Students data

The data (shared by Institute) shows there were 645 male; 930 female and thus 1,584 students.

2.1.2 Staff data

Sl. No.	Particulars	Male	Female	Total
1	Admin Staff	06	04	10
2	Teaching Staff	50	30	80
3	Non-teaching Staff	14	02	16
Total		**70**	**36**	**106**

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

Above data documents 106 staff members.

Thus, total populace stands at 1,690 nos.

3. Observation

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 ☑ Environment audit ☑ Gender Audit ~~Energy audit~~

Institute: Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College. **Date:** 16-12-2024

Document objective: Inferences of the Site visit

Observations (Positive aspects)	**Suggestions** (Improvement aspects)
Green Audit	
- Cleanliness (Hygiene); 'No plastic' & vermi-compost for (waste); 3 types of rain water harvesting (landscape-tank & pit)	- Undertake Unnat Bharat Abhiyan project - Document facilities & display same
Gender ~~Energy~~ Audit	
- Posh & Vidyarthi Manch doing initiatives	- Newsletter - Magzine - Undertake SDG 5, 10, 16
Environment Audit	
- AQI levels around 57 ppm - Good green cover (Oxygen hub, medicinal, botanical, organic farm & Miyawaki)	- Undertake carbon sequestration study on Institute level

Signature & round seal
Name: [illegible] Gavit
Designation: IQAC Co-ordinator
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 1: Evidence files related to inferences

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 (IIA's)
Audit objective: Green Building up gradation of the premises

Audits covered: ☑ Green audit ☑ Gender Energy audit ☑ Environment audit

Institute: Annasaheb Apate Arts, Commerce & Hutatma Babu Genu Science College. **Date:** 16-12-2024

Document objective: Proof of the Site visit

Meeting with the core team

Investigation of the systems

Signature & round seal
Name: Ms. H. J. Gavit
Designation: IQAC Co-ordinator
For the said Institute

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

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

Plate 2: Evidence files related to proof

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~~ Gender audit ☑ Environment audit

Institute: Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College **Date:** 16-12-2024

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.	Ms. H. J. Gavit	Internal	IQAC - Co-ordinator	
4.	Dr. S. C. Mahakal	Internal	POSH Committee Chairman.	
5	Prof. Pokale S. T	Internal	Member	
6	Ms. P. J. Pawar	Internal	Student Representative	

Signature & round seal
Name: Ms. H. J. Gavit
Designation: IQAC Co-ordinator
For the said Institute

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

Plate 3: Evidence files related to induction

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~~ Gender audit ☑ Environment audit

Institute: Annasaheb Ahoate Arts Commerce & Hutatma Babu Genu Science College. **Date:** 16-12-2024

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.	Ms. H. T. Gavit	Internal	IQAC Co-ordinator	
4.	Mr. S. T. Pokale	Internal	Member	

Signature & round seal
Name: Ms. H. T. Gavit
Designation: IQAC Co-ordinator
For the said Institute

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

Plate 4: Evidence files related to discussion

4. Investigation

The following results were carried out during visit on ***16 December 2024***.

4.1 Micro-site study

1. Admin A bldg Iqac room second floor @ 10:51 (Enclosed area)

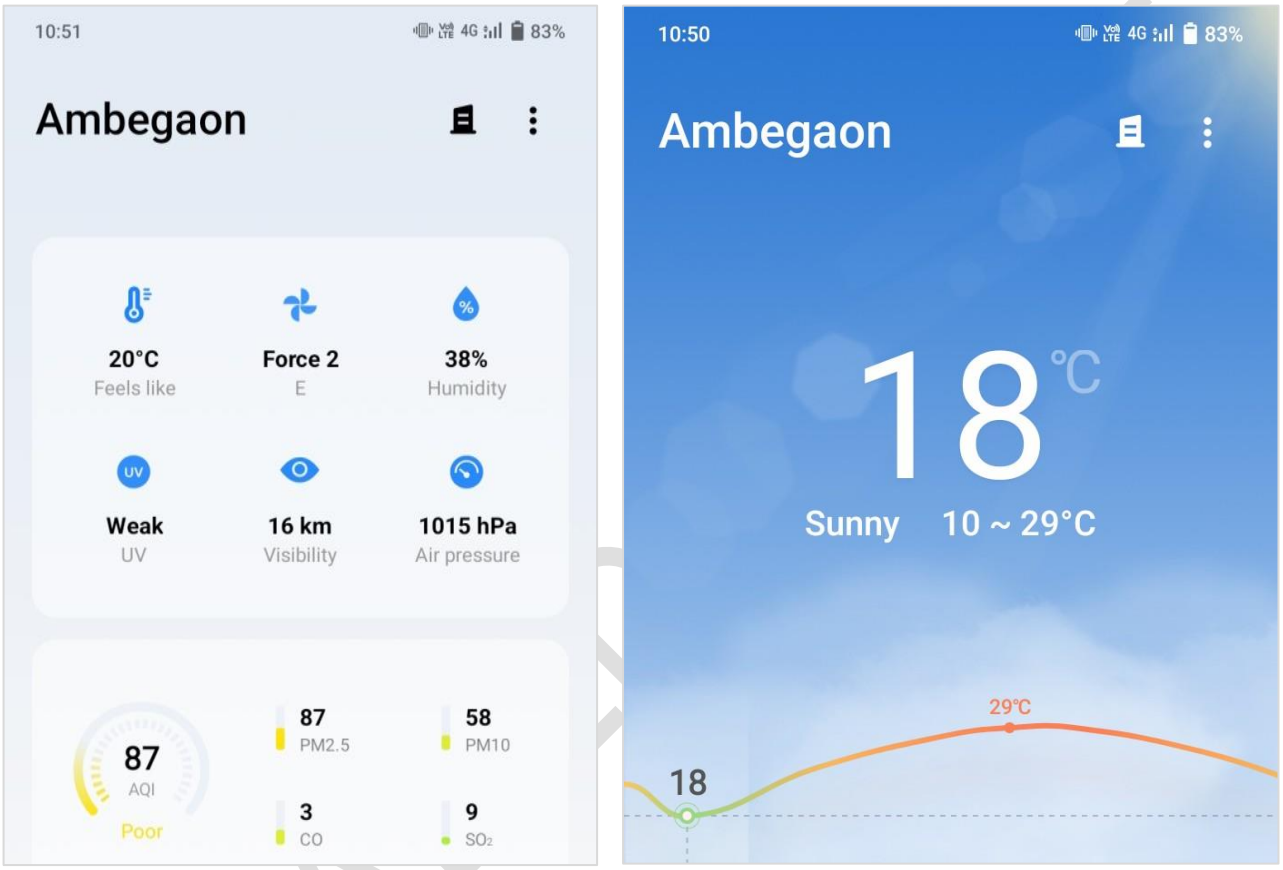


Figure 1: Study at Admin A bldg Iqac room second floor

The details are noted below:

- Micro-climate temperature of site in (degree Celsius) – 18
- Particulate matter 2.5 micrometres or less in diameter ($PM_{2.5}$) – 87
- Particulate matter 10 micrometres or less in diameter (PM_{10}) – 58
- Carbon Monoxide (CO) – 3
- Sulphur dioxide (SO_2) – 9
- **As per the application the AQI was 89 and found to be Poor**

2. Outdoor (Open area) @ 12:06

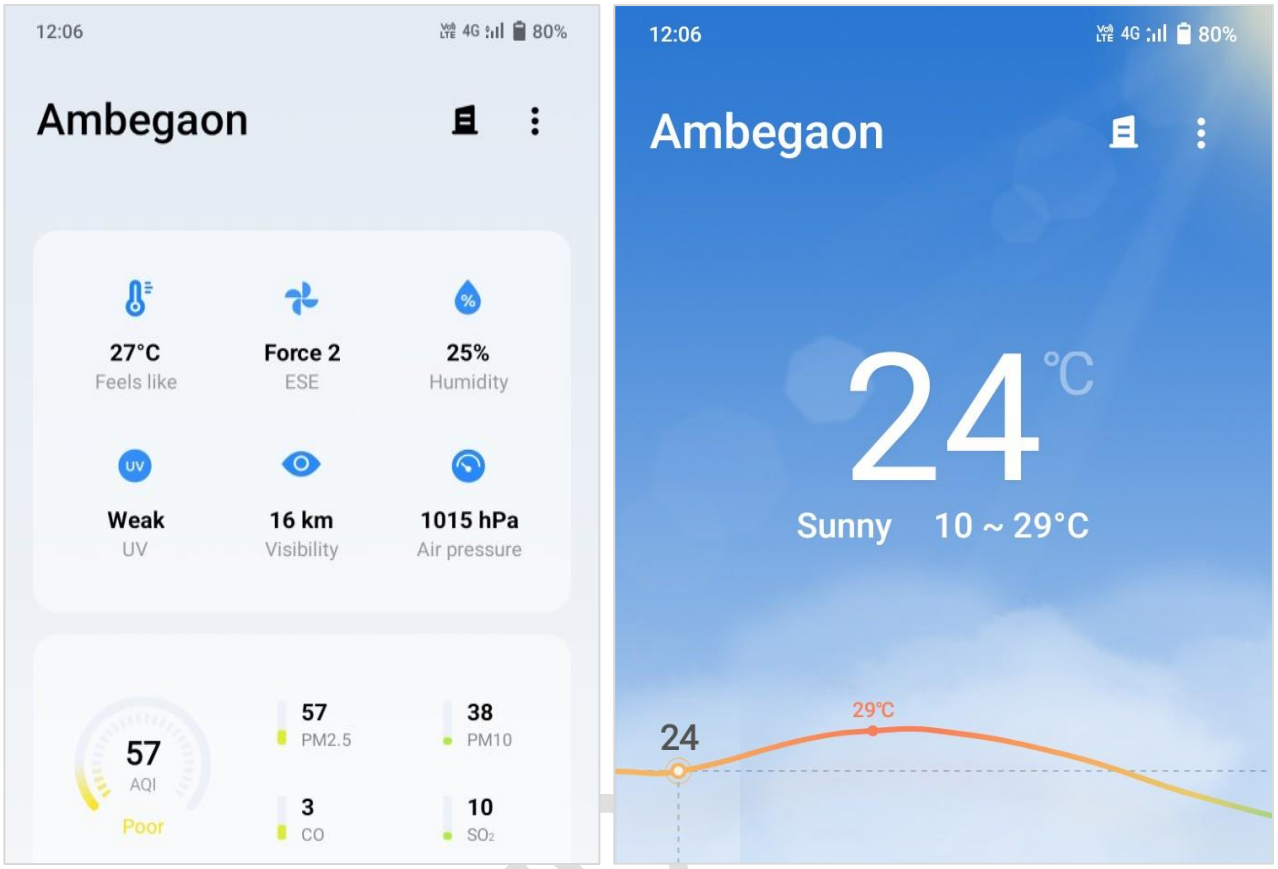


Figure 2: Study at Outdoor (Open area)

The details are noted below:

- Micro-climate temperature of site in (degree Celsius) – 24
- Particulate matter 2.5 micrometres or less in diameter ($PM_{2.5}$) – 57
- Particulate matter 10 micrometres or less in diameter (PM_{10}) – 38
- Carbon Monoxide (CO) – 3
- Sulphur dioxide (SO_2) – 10
- **As per the application the AQI was 57 and found to be Poor**

3. Library block (Enclosed space) @ 12:24

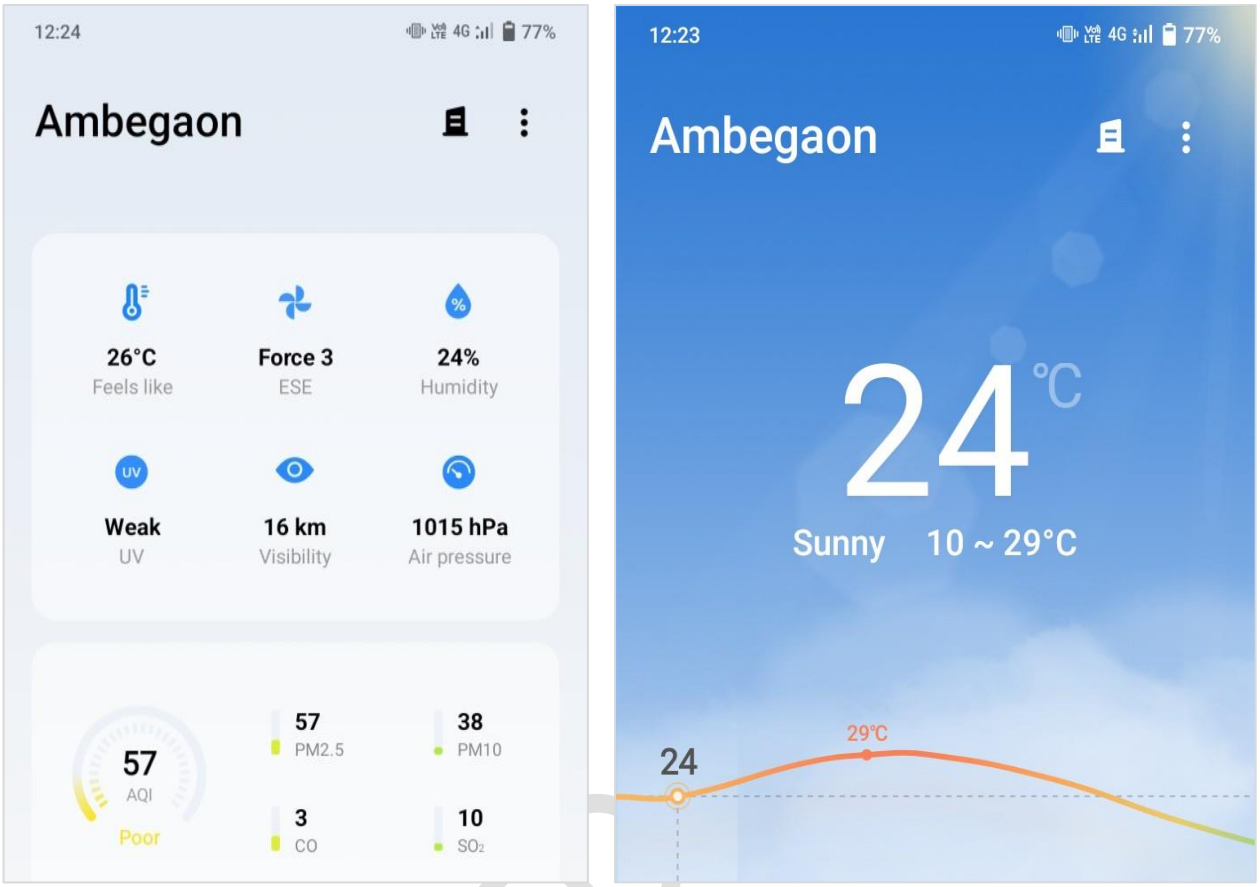


Figure 3: Study at Library block (Enclosed space)

The details are noted below:

- Micro-climate temperature of site in (degree Celsius) – 24
- Particulate matter 2.5 micrometres or less in diameter ($PM_{2.5}$) – 57
- Particulate matter 10 micrometres or less in diameter (PM_{10}) – 38
- Carbon Monoxide (CO) – 3
- Sulphur dioxide (SO_2) – 10
- **As per the application the AQI was 57 and found to be Poor**

4.2 Macro summary study

4.2.1 Institute level

This study is the combined study of all the micro-studies taken place in previous section to draw a specific conclusion of overall AQI.

S. No.	Time	AQI as per meter	AQI Comment	Requires improvement
1.	Admin A bldg Iqac room second floor @ 10:51 (Enclosed area)	87	Poor	May be green cover can be increased to improve the AQI
2.	Outdoor (Open area) @ 12:06	57	Poor	
3.	Library block (Enclosed space) @ 12:24	57	Poor	

Table 2: Macro level study of the site – AQI parameters

The above study was conducted using the HuaFeng Accuweather software.

As the above study shows the sampling carried in all areas following are major observations:

- The AQI is 'Poor' in all areas (Indoor and outdoor)
- The time when testing was done was December month and winter season (Early morning to mid afternoon)

4.2.2 City level

Plate 5: AQI study - Macro level from a carbon footprint aspect

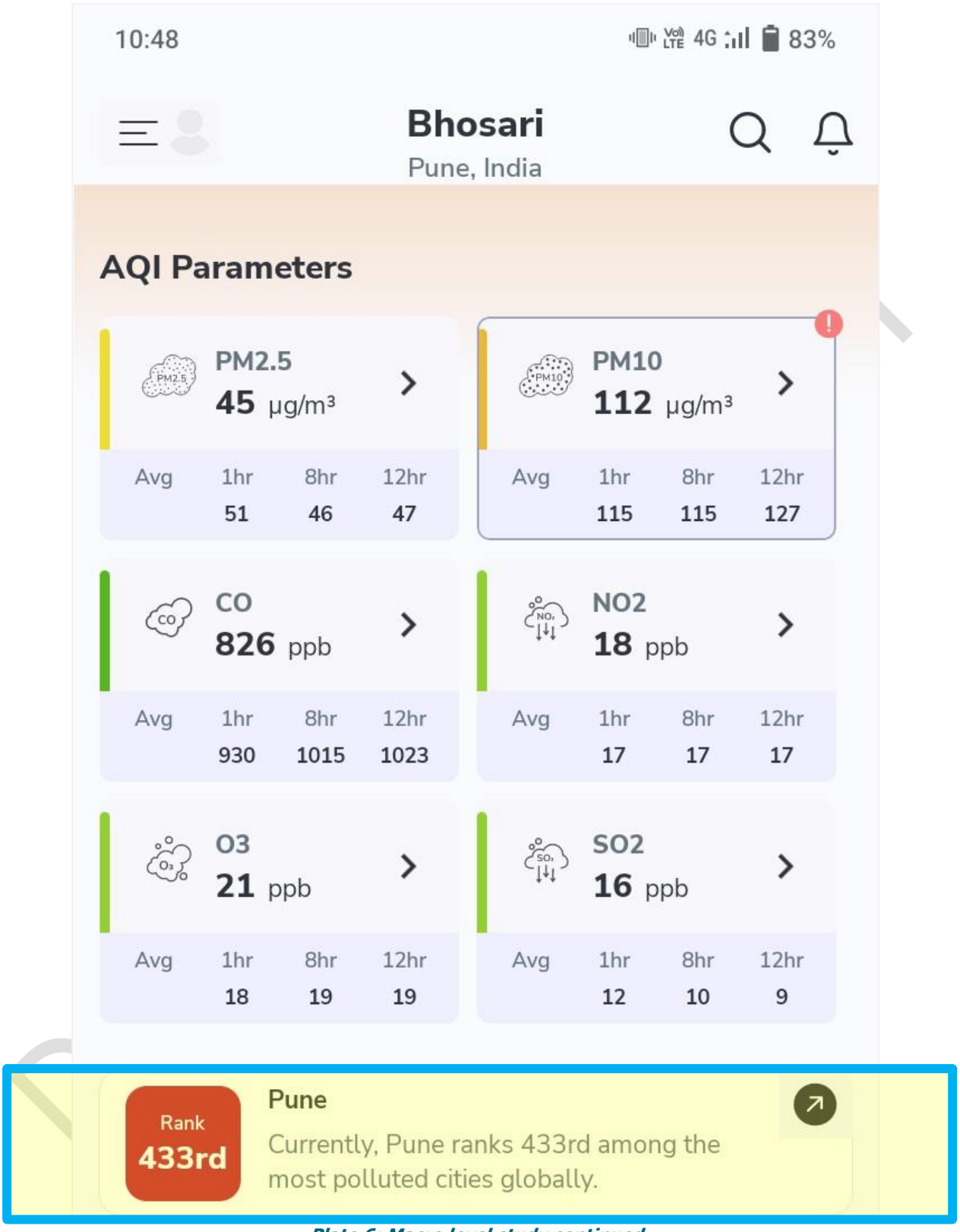


Plate 6: Macro level study continued

As per above study through the AQI software (Referring to the blue highlighted box) PUNE ranks 433rd among polluted cities which reflects it is not highly polluted.

5. Documentation

5.1 Ecological audit

The campus is well divided into:

- Open space – Further divided as:
  - Hardscape
    - Driveways
    - Walkways
  - Softscape
    - Garden
    - Play area
    - Open ground
- Built space – Further divided as:
  - Constructed area
  - Under construction area

Plate 7: Open ground with plantations

5.2 Biodiversity (Flora) audit

The provided information is documented below:

5.2.1 Flora audit

S. No.	Plant name	Type	Nos.
1	*Acacia nilotica Linn*	Tree	1007
2	*Adenium obesum Roem. &Schult.*	Shrub	06
3	*Aegle marmelos (L) Curreia*	Tree	06
4	*Ailanthus altissima Desf.*	Tree	10
5	*Albizia lebbeck (L) Benth*	Tree	02
6	*Allamanda cathartica L*	Shrub	20
7	*Aloe vera (L.) Burm.f.*	Herb	1003
8	*Alstonia scholaris (L.) R. Br.*	Tree	30
9	*Annona reticulate L.*	Tree	05
10	*Annona squamosa L.*	Tree	3007
11	*Araucaria columnaris (J.R.Forst.) Hook.*	Tree	02
12	*Araucaria excels R.Br.*	Tree	02
13	*Asparagus racemosus L.*	Climber	10
14	*Azadirachata indica L*	Tree	103
15	*Bambusa bambos (L) Voss.*	Tree	407
16	*Bauhonia purpuria L.*	Tree	25
17	*Bixa orellana L.*	Shrub	05
18	*Bombax cieba L.*	Tree	25
19	*Bougainvillea spectabilis Willd.*	Climber	51
20	*Butea monosperma L.*	Tree	08
21	*Callistemon lanceolatus R.Br.*	Shrub	06
22	*Canna indica L*	Herb	100
23	*Carica papaya L.*	Herb	66
24	*Caryota urens L.*	Tree	08
25	*Cascabela thevetia L. (Lippold)*	Shrub	12
26	*Cassia fistula Linn*	Tree	12
27	*Casurina equisetiflia L.*	Tree	04
28	*Ceropegia media L.*	Climber	01

29	*Cesalpinia pulcherrima (L.) Sw*	Tree	10
30	*Cestrum nocturnum L*	Shrub	04
31	*Calotropis gigantea (L.) Dryand*	Shrub	75
32	*Cocos nucifera L.*	Tree	137
33	*Combretum indicum (L.)*	Climper	25
34	*Cupressus sempervirens L.*	Shrub	04
35	*Cycas circinalis L.*	Tree	05
36	*Cycas revolute Thunb.*	Tree	02
37	*Cynodon barberi Rang. &Tadul.*	Herb	Many
38	*Cynodon dactylon (L.) Pers.*	Herb	Many
39	*Cynodon nlemfuensis Vanderyst.*	Herb	Many
40	*Cynodon plectostachyus (K. Schum) Pilg.*	Herb	Many
41	*Cyperus rotundus L.*	Herb	Many
42	*Cyperus alterniflolius Rottb.*	Herb	Many
43	*Dalbergia sisoo Roxb.*	Tree	45
44	*Datura metel L.*	Shrub	07
45	*Delonix regia Rafin*	Tree	10
46	*Dracaena braunii Engl.*	Shrub	40
47	*Dracaena marginata Lam.*	Tree	05
48	*Duranta erecta L.*	Shrub	1321
49	*Dypsis lutescens (H. Wendl.) Beentie & J.Dransf*	Tree	06
50	*Epipremnum aureum (Linden & André) G.S. Bunting*	Climber	25
51	*Eucalyptus globulus Labill.*	Tree	25
52	*Euphorbia bulbispina Rauh & Razaf.*	Shrub	01
53	*Euphorbia canariensis L.*	Shrub	10
54	*Euphorbia lacteal Hawk.*	Shrub	02
55	*Euphorbia tithymaloides L.*	Shrub	50
56	*Ficus bengalensis L.*	Tree	25
57	*Ficus benjamina L.*	Tree	50
58	*Ficus elastic Roxb.exHornem.*	Tree	01
59	*Ficus racemose Roxb.*	Tree	15

60	*Gliricidia sepium Kunth*	Tree	387
61	*Hamelia patens Jacq.*	Shrub	20
62	*Hibiscus rosa-sinensus L.*	Shrub	30
63	*Hyophorbe lagenicaulis (L.H.Bailey) H.E.Moore*	Tree	12
64	*Ipomoea purpurea (L.) Roth*	Climber	2751
65	*Ixora coccinea L.*	Shrub	15
66	*Jacaranda mimosifolia D. Don*	Tree	06
67	*Jasminum sambac (L.) Aiton*	Shrub	10
68	*Jatropha curcas L*	Shrub	107
69	*Justicia adhatoda L.*	Shrub	08
70	*Kalanchoe pinnata (Lam.) Pers*	Herb	97
71	*Lantana camara L.*	Shrub	2709
72	*Leucaena leucocephala (Lam.) de Wit*	Tree	5011
73	*Livistona rotundifloia (Lam)*	Tree	02
74	*Mangifera indica L.*	Tree	71
75	*Michelia champaca (L.) Baill. ex Pierre.*	Tree	02
76	*Millingtonia hortensis L. f.*	Tree	25
77	*Mimosa pudica L.*	Herb	109
78	*Monoon longifolium Sonn. B.Xue & R.M.K.Saunders*	Tree	50
79	*Moringa oleifera Lam.*	Tree	25
80	*Murraya koenigii (L.) Spreng*	Tree	10
81	*Nerium indicum MILL.*	Shrub	25
82	*Nyctanthes arbor-tristis L.*	Shrub	02
83	*Ocimum tenuiflorum L*	Herb	30
84	*Ocimum sanctum L*	Herb	100
85	*Oroxylum indicum (L.) Benth. ex Kurz*	Tree	02
86	*Passiflora endulis Sims*	Climber	04
87	*Phyllanthus emblica L.*	Tree	45
88	*Pithecellobium dulce (Roxb.) Benth*	Tree	10
89	*Plumeria rubra L.*	Tree	02
90	*Plumeria obtuse L.*	Tree	03
91	*Pongamia pinnata (L.) Pierre*	Tree	10
92	*Portulaca oleracea L.*	Herb	2967

93	*Prosopis juliflora (Sw.) DC.*	Tree	71
94	*Psidium guajava L.*	Tree	79
95	*Pyrostegia venusta (Ker Gawl.) Miers*	Climber	02
96	*Ricinus communis L.*	Shrub	97
97	*Rosa indica L.*	Shrub	07
98	*Saraca ashoka L*	Tree	01
99	*Santalum album L.*	Tree	25
100	*Senna siamea (Lam.) Irwin et Barneby*	Tree	05
101	*Spathodea campanulata P.*	Tree	08
102	*Beauv.*		
103	*Stereospermum chelonoides DC.*	Tree	01
104	*Syzygium cumini (L.)*	Tree	103
105	*Tabernaemontana divaricata (L.) R.Br. ex Roem. &Schult.*	Shrub	08
106	*Tamarindus indica L.*	Tree	850
107	*Tectona grandis Linn..*	Tree	30
108	*Terminalia catappa L.*	Tree	10
109	*Thespesia populnea*	Tree	10
110	*Sol. ex Corrêa*		
111	*Thevetia neriifolia Juss.ex A.DC.*	Shrub	20
112	*Thuja occidentalis L.*	Tree	60
113	*Tinospora cordifolia (Thunb.) Miers*	Climber	571
114	*Tradescantia spathacea Sw.*	Herb	07
115	*Vinca roseus (L.) G. Don.*	Herb	319
116	*Vitex negundo L.*	Tree	04
117	*Withania somnifera (L) Dunal*	Shrub	1931
118	*Ziziphus jujube Mill*	Tree	27
119	*Annona muricata L.*	Shrub	02
120	*Aegle marmelos*	Medicinal Plant	No info provided
122	*Aloe vera (L.) Burm.f.*	Medicinal Plant	
123	*Azadirachata indica L.*	Medicinal Plant	
124	*Bixa orellana L.*	Medicinal Plant	
125	*Butea monosperma*	Medicinal Plant	

126	*Cassia fistula Linn.*	Medicinal Plant	
127	*Cynodon dactylon (L.) Pers.*	Medicinal Plant	
128	*Dalbergia sisoo Roxb.*	Medicinal Plant	
129	*Eucalyptus globulus Labill.*	Medicinal Plant	
130	*Hibiscus rosa- sinensus L.*	Medicinal Plant	
131	*Jatropha curcas L*	Medicinal Plant	
132	*Justicia adhatoda L.*	Medicinal Plant	
133	*Kalanchoe pinnata (Lam.) Pers*	Medicinal Plant	
134	*Lantana camara L.*	Medicinal Plant	
135	*Ocimum sanctum L.*	Medicinal Plant	
136	*Oroxylum indicum (L.) Benth. ex Kurz*	Medicinal Plant	
138	*Phyllanthus emblica L.*	Medicinal Plant	
140	*Saraca ashoka L*	Medicinal Plant	
141	*Santalum album L.*	Medicinal Plant	
142	*Tinospora cordifloia (Thunb) Miers*	Medicinal Plant	
143	*Vitex negundo L.*	Medicinal Plant	

Table 3: Details about the flora in the campus

As per above study there are more than 26,748 nos. of plantations of various typologies.

Query	Yes/ No	If yes then details
Any research carried about flora?	Yes	A study was carried out entitled "Study of Diversity and Its Medicinal Impostance of Family Convolvulaceae in Ambegaon Tehsil, Dist. Pune, MS, India" by a College staff under Seed Money Project.
Any Publication presented about flora of campus?	Yes	-
Any book prepared about flora of campus?	No	Flora and Fauna of Annasaheb Awate College, Manchar

Table 4: Technical data about the flora

5.2.2 Fauna audit

The shared data is documented below:

Sr. No	Scientific Name	Category
1	*Jatropha podagrica Hook.*	Angiosperms
2	*Varanus bengalensis Daudin.*	Reptiles
3	*Eryx johnii Russell.*	Reptiles
4	*Nephrolepis exaltata (L.) Schott*	Pteridophyta
5	*Dalbergia melanoxylon Guill. & Perr.*	Angiosperms
6	*Bubulcus ibis Linnaeus*	Birds
7	*Hottentotta tamulus Fabricius*	Reptiles
8	*Felis chaus Schreber*	Mammals
9	*Hypolimnas bolina Linnaeus*	Butterflies
10	*Tirumala limniace Cramer*	Butterflies
11	*Ariadne merione Cramer*	Butterflies
12	*Charaxes solon Fabricius*	Butterflies
13	*Papilio demoleus Linnaeus*	Butterflies
14	*Leptotes plinius Fabricius*	Butterflies
15	*Eurema hecabe Linnaeus*	Butterflies
16	*Neptis hylas Linnaeus*	Butterflies
17	*Cepora Nerissa Fabricius*	Butterflies
18	*Junonia iphita Cramer*	Butterflies
19	*Junonia orithya Linnaeus*	Butterflies
20	*Junonia atlites Linnaeus*	Butterflies
21	*Iambrix salsala Moore*	Butterflies
22	*Danaus chrysippus Linnaeus.*	Butterflies
23	*Danaus genutia Cramer.*	Butterflies
24	*Canis lupus pallipes Sykes.*	Mammals
25	*Lonchura striata Linnaeus.*	Birds
26	*Eumyias thalassinus Swainson.*	Birds
27	*Corvus benghalensis Linnaeus*	Birds
28	*Luscinia svecica Linnaeus.*	Birds
29	*Eudynamys scolopaceus Linnaeus.*	Birds
30	*Psilopogon haemacephalus Statius Müller.*	Birds
31	*Hypothymis azurea Boddaert.*	Birds
32	*Copsychus malabaricus Scopoli.*	Birds
33	*Streptopelia decaocto Frivaldszky.*	Birds
34	*Lonchura malacca Linnaeus.*	Birds

35	*Cyornis tickelliae Blyth.*	Birds
36	*Copsychus saularis Linnaeus.*	Birds
37	*Nycticorax nycticorax Linnaeus.*	Birds
38	*Terpsiphone paradisi Linnaeus.*	Birds
39	*Glaucidium radiatum Tickell.*	Birds
40	*Pitta brachyura Linnaeus.*	Birds
41	*Corvus splendens Vieillot.*	Birds
42	*Corvus culminates Sykes.*	Birds
43	*Ardeola grayii Sykes.*	Birds
44	*Turnix suscitator Gmelin.*	Birds
45	*Prinia socialis Sykes.*	Birds
46	*Aegithina tiphia Linnaeus.*	Birds
47	*Amaurornis phoenicurus Pennant.*	Birds
48	*Oenanthe fusca Blyth.*	Birds
49	*Copsychus fulicatus Linnaeus.*	Birds
50	*Amandava amandava Linnaeus.*	Birds
51	*Pycnonotus jocosus Linnaeus.*	Birds
52	*Acridotheres tristis Linnaeus.*	Birds
53	*Centropus sinensis Stephens.*	Birds
54	*Ploceus philippinus Linnaeus.*	Birds
55	*Vanellus malabaricus Boddaert.*	Birds
56	*Zosterops japonicus Temminck and Schlegel.*	Birds
57	*Pycnonotus cafer Linnaeus.*	Birds
58	*Passer domesticus Linnaeus.*	Birds
59	*Merops orientalis Latham.*	Birds
60	*Lonchura punctulata Linnaeus.*	Birds
61	*Cinnyris asiaticus Latham*	Birds
62	*Dicrurus macrocercus Vieillot.*	Birds
63	*Columba livia Gmelin.*	Birds
64	*Leptocoma zeylonica Linnaeus.*	Birds
65	*Halcyon smyrnensis Linnaeus.*	Birds
66	*Ceyx erithaca Linnaeus.*	Birds
67	*Psittacula krameria Scopoli.*	Birds
68	*Pavo cristatus Linnaeus.*	Birds
69	*Vulpes bengalensis Shaw.*	Mammals
70	*Macaca mulatta Zimmermann.*	Mammals
71	*Semnopithecus entellus Dufresne.*	Mammals

72	*Ratufa indica Erxleben.*	Mammals
73	*Panthera pardus spp. fusca Meyer*	Mammals
74	*Oryctolagus cuniculus domesticus Linnaeus.*	Mammals
75	*Lepus nigricollis F. Cuvier*	Mammals
76	*Hyaena hyaena Linnaeus.*	Mammals
77	*Funambulus palmarum Linnaeus*	Mammals
78	*Chamaeleo zeylanicus Laurenti.*	Reptiles
79	*Urva edwardsii E. Geoffroy Saint Hilaire*	Mammals
80	*Calotes versicolo Daudin.*	Reptiles
81	*Craspedocephalus gramineus Shaw.*	Reptiles
82	*Lycodon aulicus Linnaeus.*	Reptiles
83	*Xenochrophis piscator Schneider*	Reptiles
84	*Rhabdophis plumbicolor Cantor*	Reptiles
85	*Python molurus Linnaeus*	Reptiles
86	*Ptyas mucosa Linnaeus.*	Reptiles
87	*Oligodon arnensis Shaw.*	Reptiles
88	*Naja naja Linnaeus*	Reptiles
89	*Sphenomorphus indicus Gray.*	Reptiles
90	*Eryx whitakeri Das*	Reptiles
91	*Eryx conicus Schneider*	Reptiles
92	*Daboia russelii Shaw & Nodder*	Reptiles
93	*Coelognathus helena Daudin.*	Reptiles
94	*Bungarus caeruleus Schneider*	Reptiles
95	*Boiga trigonata Schneider*	Reptiles
96	*Boiga beddomei Wall.*	Reptiles
97	*Platyceps plinii V. Deepak and Surya Narayanan*	Reptiles
98	*Amphiesma stolatum Linnaeus*	Reptiles
99	*Ahaetulla oxyrhyncha Bell.*	Reptiles
100	*Juniperus squamata D.Don*	Gymnosperms
101	*Lagerstroemia indica L.*	Angiosperms
102	*Dendrophthoe falcata (L.f.) Ettingsh.*	Angiosperms
103	*Nymphaea pubescens Willd.*	Angiosperms
104	*Ziziphus jujuba Mill.*	Angiosperms
105	*Zinnia peruviana (L.) L.*	Angiosperms
106	*Zamia furfuracea L.f. ex Aiton*	Gymnosperms
107	*Withania somnifera (L.) Dunal*	Angiosperms
108	*Vitex negundo L.*	Angiosperms

109	*Vachellia nilotica (L.) P.J.H.Hurter & Mabb.*	Angiosperms
110	*Tithonia diversifolia (Hemsl.) A.Gray*	Angiosperms
111	*Tinospora cordifolia (Willd.) Hook.f. & Thomson*	Angiosperms
112	*Thespesia populnea (L.) Sol. ex Corrêa*	Angiosperms
113	*Terminalia chebula Retz.*	Angiosperms
114	*Terminalia catappa L.*	Angiosperms
115	*Terminalia bellirica (Gaertn.) Roxb.*	Angiosperms
116	*Tectona grandis L.f.*	Angiosperms
117	*Tecoma stans (L.) Juss. ex Kunth*	Angiosperms
118	*Tecoma smithii W.Watson*	Angiosperms
119	*Tecomaria capensis (Thunb.) Spach*	Angiosperms
120	*Tamarindus indica L.*	Angiosperms
121	*Tabebuia aurea (Silva Manso) Benth. & Hook.f. ex S.Moore*	Angiosperms
122	*Syzygium cumini (L.) Skeels*	Angiosperms
123	*Sterculia foetida L.*	Angiosperms
124	*Stachytarpheta indica (L.) Vahl*	Angiosperms
125	*Spathodea campanulata P.Beauv.*	Angiosperms
126	*Solanum erianthum D.Don*	Angiosperms
127	*Solanum crispum Ruiz & Pav.*	Angiosperms
128	*Senna tora (L.) Roxb.*	Angiosperms
129	*Bougainvillea spectabilis Willd.*	Angiosperms
130	*Bombax insigne Wall.*	Angiosperms
131	*Bombax ceiba L.*	Angiosperms
132	*Bergera koenigii L.*	Angiosperms
133	*Beaucarnea recurvata Lem.*	Angiosperms
134	*Bauhinia racemosa Lam.*	Angiosperms
135	*Bauhinia purpurea L.*	Angiosperms
136	*Bambusa bambos (L.) Voss*	Angiosperms
137	*Azadirachta indica A.Juss.*	Angiosperms
138	*Asparagus racemosus Willd.*	Angiosperms
139	*Asclepias curassavica L.*	Angiosperms
140	*Artabotrys hexapetalus (L.f.) Bhandari*	Angiosperms
141	*Areca catechu L.*	Angiosperms
142	*Araucaria columnaris (G.Forst.) Hook.*	Gymnosperms
143	*Jatropha integerrima Jacq.*	Angiosperms
144	*Rosa indica L.*	Angiosperms
145	*Putranjiva roxburghii Wall.*	Angiosperms

146	*Murraya paniculata (L.) Jack*	Angiosperms
147	*Sapindus mukorossi Gaertn.*	Angiosperms
148	*Butea monosperma (Lam.) Kuntze*	Angiosperms
149	*Guilandina bonduc L.*	Angiosperms
150	*Caesalpinia pulcherrima (L.) Sw.*	Angiosperms
151	*Cryptostegia grandiflora Roxb. ex R.Br.*	Angiosperms
152	*Gloriosa superba L.*	Angiosperms
153	*Euphorbia neriifolia L.*	Angiosperms
154	*Cyperus alternifolius L.*	Angiosperms
155	*Semecarpus anacardium L.f.*	Angiosperms
156	*Acacia auriculiformis A.Cunn. ex Benth.*	Angiosperms
157	*Citrus aurantium L.*	Angiosperms
158	*Platycladus orientalis (L.) Franco*	Gymnosperms
159	*Pseuderanthemum maculatum (G.Lodd.) I.M.Turner*	Angiosperms
160	*Albizia amara (Roxb.) Boivin*	Angiosperms
161	*Senna auriculata (L.) Roxb.*	Angiosperms
162	*Vachellia leucophloea (Roxb.) Maslin, Seigler & Ebinger*	Angiosperms
163	*Saraca asoca (Roxb.) W.J.de Wilde*	Angiosperms
164	*Santalum album L.*	Angiosperms
165	*Roystonea regia (Kunth) O.F.Cook*	Angiosperms
166	*Ricinus communis L.*	Angiosperms
167	*Ravenia spectabilis (Lindl.) Engl.*	Angiosperms
168	*Ravenala madagascariensis Sonn.*	Angiosperms
169	*Combretum indicum (L.) DeFilipps*	Angiosperms
170	*Punica granatum L.*	Angiosperms
171	*Psidium guajava L.*	Angiosperms
172	*Prosopis juliflora (Sw.) DC.*	Angiosperms
173	*Monoon longifolium (Sonn.) B.Xue & R.M.K.Saunders*	Angiosperms
174	*Plumeria rubra L.*	Angiosperms
175	*Plumeria pudica Jacq.*	Angiosperms
176	*Plumeria obtusa L.*	Angiosperms
177	*Plumbago zeylanica L.*	Angiosperms
178	*Pithecellobium dulce (Roxb.) Benth.*	Angiosperms
179	*Pinus roxburghii Sarg.*	Gymnosperms
180	*Pimenta dioica (L.) Merr.*	Angiosperms
181	*Phyllanthus emblica L.*	Angiosperms
182	*Phyllanthus acidus (L.) Skeels*	Angiosperms

183	*Phoenix sylvestris (L.) Roxb.*	Angiosperms
184	*Petrea volubilis L.*	Angiosperms
185	*Peltophorum pterocarpum (DC.) Backer ex K.Heyne*	Angiosperms
186	*Passiflora incarnata L.*	Angiosperms
187	*Oroxylum indicum (L.) Kurz*	Angiosperms
188	*Ocimum tenuiflorum L.*	Angiosperms
189	*Opuntia elatior Mill.*	Angiosperms
190	*Nyctanthes arbor-tristis L.*	Angiosperms
191	*Nerium oleander L.*	Angiosperms
192	*Musa paradisiaca L.*	Angiosperms
193	*Muntingia calabura L.*	Angiosperms
194	*Morus alba L.*	Angiosperms
195	*Moringa oleifera Lam.*	Angiosperms
196	*Mitragyna parvifolia (Roxb.) Korth.*	Angiosperms
197	*Mimusops elengi L.*	Angiosperms
198	*Millingtonia hortensis L.fil.*	Angiosperms
199	*Pongamia pinnata (L.) Pierre*	Angiosperms
200	*Melia azedarach L.*	Angiosperms
201	*Mansoa alliacea (Lam.) A.H.Gentry*	Angiosperms
202	*Manihot esculenta Crantz*	Angiosperms
203	*Mangifera indica L.*	Angiosperms
204	*Magnolia champaca (L.) Baill. ex Pierre*	Angiosperms
205	*Madhuca longifolia (J.Koenig ex L.) J.F.Macbr.*	Angiosperms
206	*Livistona chinensis (Jacq.) R.Br. ex Mart.*	Angiosperms
207	*Limonia acidissima L.*	Angiosperms
208	*Datura innoxia Mill.*	Angiosperms
209	*Malpighia emarginata DC.*	Angiosperms
210	*Leucaena leucocephala (Lam.) de Wit*	Angiosperms
211	*Lantana camara L.*	Angiosperms
212	*Khaya senegalensis (Desv.) A.Juss.*	Angiosperms
213	*Justicia adhatoda L.*	Angiosperms
214	*Jatropha curcas L.*	Angiosperms
215	*Jasminum sambac (L.) Aiton*	Angiosperms
216	*Jasminum grandiflorum L.*	Angiosperms
217	*Jacaranda mimosifolia D.Don*	Angiosperms
218	*Ixora coccinea L.*	Angiosperms
219	*Ipomoea carnea Jacq.*	Angiosperms

220	*Hymenocallis speciosa (L.f. ex Salisb.) Salisb.*	Angiosperms
221	*Holoptelea integrifolia (Roxb.) Planch.*	Angiosperms
222	*Hibiscus rosa-sinensis L.*	Angiosperms
223	*Helicteres isora L.*	Angiosperms
224	*Hamelia patens Jacq.*	Angiosperms
225	*Gmelina arborea Roxb. ex Sm.*	Angiosperms
226	*Gliricidia sepium (Jacq.) Kunth*	Angiosperms
227	*Gardenia resinifera Roth*	Angiosperms
228	*Galphimia glauca Bartl.*	Angiosperms
229	*Flueggea virosa (Roxb. ex Willd.) Royle*	Angiosperms
230	*Ficus religiosa L.*	Angiosperms
231	*Ficus racemosa L.*	Angiosperms
232	*Ficus elastica Roxb. ex Hornem.*	Angiosperms
233	*Ficus benjamina L.*	Angiosperms
234	*Ficus benghalensis L.*	Angiosperms
235	*Euphorbia milii Des Moul.*	Angiosperms
236	*Corymbia citriodora (Hook.) K.D.Hill and L.A.S.Johnson*	Angiosperms
237	*Erythrina suberosa Roxb.*	Angiosperms
238	*Epipremnum aureum (Linden & André) G.S.Bunting*	Angiosperms
239	*Ehretia laevis Roxb.*	Angiosperms
240	*Duranta erecta L.*	Angiosperms
241	*Dracaena reflexa Lam.*	Angiosperms
242	*Dracaena marginata Lam.*	Angiosperms
243	*Dracaena angustifolia (Medik.) Roxb.*	Angiosperms
244	*Dolichandrone falcata (Wall. ex DC.) Seem.*	Angiosperms
245	*Diospyros malabarica (Desr.) Kostel.*	Angiosperms
246	*Dichrostachys cinerea (L.) Wight & Arn.*	Angiosperms
247	*Delonix regia (Bojer ex Hook.) Raf.*	Angiosperms
248	*Datura metel L.*	Angiosperms
249	*Dalbergia sissoo Roxb. ex DC.*	Angiosperms
250	*Cycas rumphii Miq.*	Gymnosperms
251	*Cycas revoluta Thunb.*	Gymnosperms
252	*Cryptolepis buchananii R.Br. ex Roem. & Schult.*	Angiosperms
253	*Colocasia esculenta (L.) Schott*	Angiosperms
254	*Cocos nucifera L.*	Angiosperms
255	*Clitoria ternatea L.*	Angiosperms
256	*Clerodendrum thomsoniae Balf.f.*	Angiosperms

257	*Clematis gouriana Roxb. ex DC.*	Angiosperms
258	*Citrus limon (L.) Osbeck*	Angiosperms
259	*Cissus quadrangularis L.*	Angiosperms
260	*Cestrum nocturnum L.*	Angiosperms
261	*Cestrum diurnum L.*	Angiosperms
262	*Catharanthus roseus (L.) G.Don*	Angiosperms
263	*Casuarina equisetifolia L.*	Angiosperms
264	*Cassia fistula L.*	Angiosperms
265	*Senna siamea (Lam.) H.S.Irwin & Barneby*	Angiosperms
266	*Carissa carandas L.*	Angiosperms
267	*Carica papaya L.*	Angiosperms
268	*Capparis zeylanica L.*	Angiosperms
269	*Calotropis procera (Aiton) Dryand.*	Angiosperms
270	*Canna indica L.*	Angiosperms
271	*Calotropis gigantea (L.) W.T.Aiton*	Angiosperms
272	*Melaleuca citrina (Curtis) Dum.Cours.*	Angiosperms
273	*Aphanamixis polystachya (Wall.) R.Parker*	Angiosperms
274	*Anthurium andraeanum Linden ex André*	Angiosperms
275	*Annona squamosa L.*	Angiosperms
276	*Annona reticulata L.*	Angiosperms
277	*Alstonia scholaris (L.) R. Br.*	Angiosperms
278	*Aloe vera (L.) Burm.f.*	Angiosperms
279	*Albizia lebbeck (L.) Benth.*	Angiosperms
280	*Calliandra haematocephala Hassk.*	Angiosperms
281	*Ailanthus excelsa Roxb.*	Angiosperms
282	*Agave americana (L.)*	Angiosperms
283	*Manilkara zapota (L.) P.Royen*	Angiosperms
284	*Aegle marmelos (L.) Correa*	Angiosperms
285	*Bursera linanoe (La Llave) Rzed., Calderón & Medina*	Angiosperms

Table 5: Information about the fauna in the premises

5.3 Carbon Footprint Audit – Heat Island Reduction

5.3. Light pollution study

This type of pollution is not experienced within premises

5.3.2 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 feature such as external temperature, internal temperatures, site context including available and site adjacent facilities. Observed features include:

- Light colored interior
- Ample space between blocks
- Huge green cover
- Light colored facades
- Provision for filtered and shaded area due to the building design

Plate 8: Elements related to heat island reduction

5.4 Noise Audit

This study is conducted within site premises.

5.4.1 Micro-level detail inputs

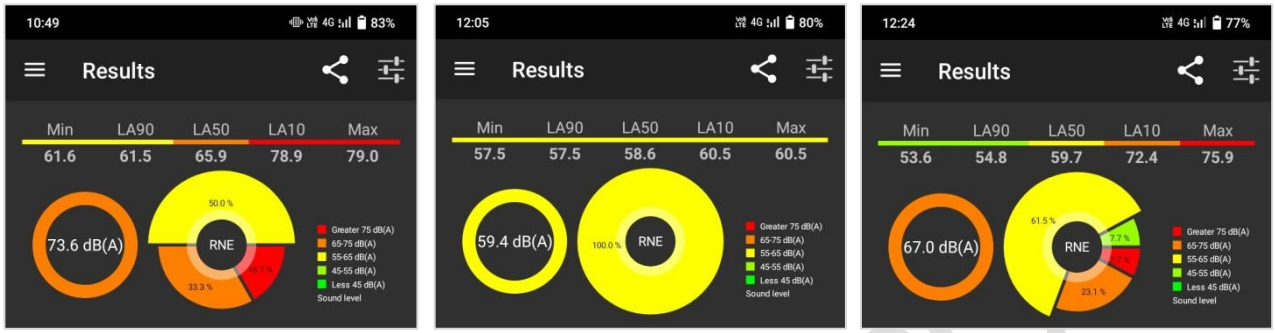


Figure 4: Noise study Principal office, outdoor area, auditorium

5.4.2 Macro level summary inputs

S. No.	Space	Type	Location	Level/ Floor	Actual Noise (dB)	Max. Noise (dB) as per norms	Requires improvement
1.	Iqac room second floor @ 10:51	Enclosed	A-Block	Ground	73.6	50	Yes
2.	Outdoor @ 12:06	Open	Not applicable	Ground	59.4	50	Not really
3.	Library block @ 12:24	Enclosed	Library Block	Ground	67.0	50	Yes

Table 6: Summary study of the noise

The above study was conducted using the NoiseCapture software.

As the above study shows the sampling carried in all areas following are major observations:

- The noise levels are more than the limit in enclosed spaces
- The outdoor areas noise levels were found to be good

5.5 Site audit (Amenities perspective)

The following amenities were observed for stakeholder assistance in the campus.

Plate 9: Shaded skylights

Plate 10: Benches for outdoor seating

6. Suggestion

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

- Conduct the 'Before' and 'After' study with photos
- Document the same in 'Action taken report'

S. No.	Aspect with evidence if any	Suggestion
1.	Ecological aspect	Suggestions are excluded for this section
2.	Biodiversity aspect **Aspect area:** **Numbering the plantations in the premises**	Make a list of all the plantations in the premises and start numbering the plantations in either of the ways: 1. Paint the nos. on iron plates and nail the same 2. Print nos. on paper, laminate and paste the same 3. Paint the nos. directly Sample image for 3 examples are noted below.  *Options for numbering the plantations* 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.

3.	Biodiversity aspect **Aspect area:** **Water and food feeders**	At appropriate locations there can be provisions for drinking water and some grains for birds as they visit the site much frequently.   ***Food and water feeder*** Waste plastic bottles can be recycled & used as a student activity
4.	Carbon footprint aspect **Aspect area:** **Environment monitoring**	Install CO_2 monitor in public areas of indoor areas such as porch and AQI meter in outdoor areas near compound wall
5.	Carbon footprint aspect **Aspect area:** **Cool rooftop**	➲ Keep terrace areas free of any kind of storage materials ➲ 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. ➲ Introduce signboards about 'No students are allowed to enter' ➲ Undertake feasibility study of before - after temperature reading. Current status for partial terrace 

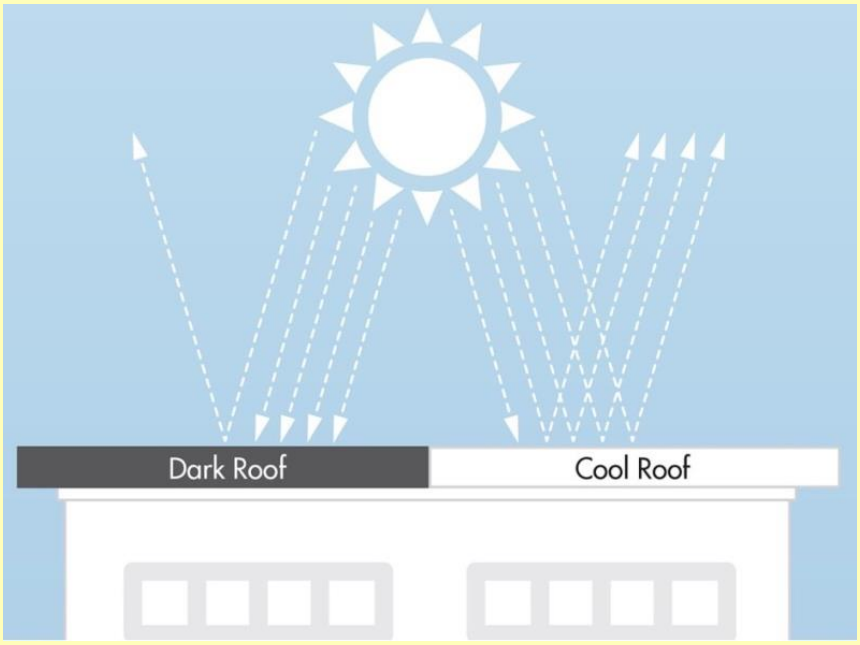
		Proposed status  ***Plate 11: Cool roof comparative analysis (For reference purpose only)*** *Source: Image by https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387*
6.	Noise aspect **Aspect area:** **Demark & display board about Silent zone**	A signboard highlighting and 'No honking or Silent zone' should be displayed outside campus near all entrance gates; near roadside approach of site (Outdoor areas) and 'Quite zone' outside the library space (Indoor areas)  
7.	**General** **Aspect area:** **Demark & display board about** zones	Intrdouce display about zones: ➲ Oxygen zone newr every type of garden ➲ Green zone near open areas

Table 7: Observation based suggestion study of the campus

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.

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