Environment Audit

Study Period (Two Years) 2020 – 2021 & 2021 – 2022

Sustainability study

AUDIT REPORT

Studied for

Women's Education Society's

Lady Amritbai Daga College for Women of Arts, Commerce and Science & Smt. Ratnidevi Purohit College of Home Science and Home Science Technology

Shankar Nagar, Nagpur – 440010, Maharashtra, India

Studied in the capacity of

Accredited with IGBC and **Certified with ASSOCHAM GEM**

Registered Architect & Green Building Professional

Studied by

Greenvio Solutions

Website https://thegreenviosolutions.co.in/

Issued on **28 January 2023** and Valid till **January 2024**

Background reference image Nic Y C Gua on unsplash

Inferences of the Site visit

Audit conducted by : Nahida Shaikh, IGBC AP, GEM CP, Architect
Accredited and Certified Green Building Professional
ASSOCHAM GEM Certified Professional Registration number 22/718
Link for the Verification website https://www.green-assocham.com/manage_gem_cp.php?pageno=12

Institute: L.A.D. & Smt. R.P. College for Women, Nagpur Date: 10-1-2023
Audits covered: Green, Energy, Environment Day: Tuesday

Observations	Inferences
- Immense ~~we~~ initiatives related to environment - plastic ban, compost, - bio toilet, - xeriscaping, - NO Vehicle zone/ Botanical	- Include smart lighting/landscape - Increase awareness/ signage - solar - parking - awareness on compound wall.

Evidence of the site visit

Signature of Ar. Nahida Shaikh,
ASSOCHAM GEM CP 22/718

L.A.D. & SMT. R.P. COLLEGE FOR WOMEN NAGPUR-10

College Name: L.A.D. & Smt. R.P. College for Women, Nagpur
Signature:
Name: Dr. ARCHANA MASRAM
Designation: Coordinator-IQAC
Date: 10-1-2023

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Name: Mrs F. A. Shaikh
Designation: Manager
Date: 10/01/2023

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Disclaimer

The Audit Team has prepared this report for the **Women's Education Society's Lady Amritbai Daga College for Women of Arts, Commerce and Science & Smt. Ratnidevi Purohit College of Home Science and Home Science Technology** located at *Shankar Nagar, Nagpur – 440010, Maharashtra, India* based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National 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 Hon'ble Management and College. 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

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Acknowledgement

The Audit Assessment Team thanks the **Women's Education Society's Lady Amritbai Daga College for Women of Arts, Commerce and Science & Smt. Ratnidevi Purohit College of Home Science and Home Science Technology, 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 due to **Adv. Sunil V. Manohar,** President; **Dr. Avinash Deshmukh,** Vice President; **Mr. Kishore Dewani,** Vice President; **Mr. Murali M. Pantula,** Treasurer; **Dr. Shyamala Nair,** Secretary; **Dr. Nanda Rathi,** Jt. Secretary and everyone from the Management.

Our heartfelt thanks to Chairperson of the entire process **Dr. Pooja Pathak,** Officiating Principal for the valuable inputs.

We are also thankful to **College's Task force the faculty members** who have collected data required

Mrs. Maya Jadhao, Asso. Prof. Dept. Botany; **Ms. Madhavi Gaikwad**, Asso. Prof. Dept. Botany; **Dr. Ashwini Balki**, Asst. Prof. Dept. Biotechnology; **Dr. Lata Katre**, Asst. Prof. Dept. Botany; **Ms. Mrunali Malkhede**, Asst. Prof. Dept. Biotechnology and **Ms. Mugdha Ranganath**, Asst. Prof. Dept. Biotechnology.

We highly appreciate the assistance of Non-teaching staff members - **Mrs. Lalita Renke, Mrs. Anita Sontakke** and the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

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

Contents

1. Introduction

1.1 About the Institution

The Lady Amritbai Daga College for Women of Arts, Commerce & Science and Smt. Ratnidevi Purohit College of Home Science and Home Science Technology is a premier Women's College in Central India in existence for the last 82 years with its goal centered around women's progress in educational, social and cultural fields. **It was established at a time when a women's College was considered a path breaking venture. The beginnings were humble.**

The College known as "College of Arts for Women" from 1932 to 1935 and as "Central College for Women" from 1935, moved to its own building in 1942 on a sprawling campus of 26 acres of land donated by the Governor Central Provinces and Berar in 1940 at Seminary Hills.

Today the versatility of the range of its programmes is its strength. **The original strength was of 23 students and presently the College has more than 4,000 students on roll in the Junior and Senior College.** The handful of staff, is now approximately 300 involved in the faculties of Arts, Science, Home Science, (B.Sc.,H.Sc. and B.Tech) and Commerce.

The institution has completed 82 years of sustained progress in the field of empowering women through access to higher education. Poised for further growth and expansion since its platinum year, the College has introduced non-conventional, innovative courses. These courses are designed to support self-help initiatives and will go beyond the traditional core degree requirements which also continue to take up community imperatives to fulfil academic social responsibilities through training initiatives in the four villages adopted by the college.

The College started initially with only the Arts faculty, today offers multiple courses in different faculties at Under Graduate, Post Graduate and Junior College level.

1.2 Statements of the Institution

1.2.1 Vision

The College proposes *"To develop the institute into a reputed brand name for excellence in academics and empower women with higher learning and research capabilities through dynamic and value based education for global competency and strength of character."*

1.2.2 Mission

The College adheres and focuses "*To foster higher education In women and thereby enlighten and empower them."*

1.2.3 Aim

The College is working towards aim of being *"Centered around women's progress in educational, social and cultural fields."*

1.2.4 Motto

The College channelizes its efforts towards the motto of *"Women Empowerment."*

1.2.5 Objective

It is the objective of the College is:

- *To introduce new courses and reinforce existing ones within the framework of the University norms.*
- *To honour academic scholarship and outstanding achievements in sports and extracurricular activities.*
- *To develop amongst its students, an academic as well as all round competency.*
- *To foster value-based, creative and critical learning.*
- *To hone skills for living in a technologically globalized and ecologically aware, environment.*
- *To ensure awareness of gender rights and gender justice in the institution.*
- *To develop amongst its students a commitment to Society.*
- *To promote life-long learning through proactive teaching and learning process.*
- *To develop in its culture a commitment to excellence.*

1.3 Assessment of the Institute

1.3.1 Affiliations

The Institute is affiliated to **Rashtrasant Tukadoji Maharaj Nagpur University (R.T.M.U.N.),** formerly Nagpur University, is a public state university located in Nagpur, Maharashtra. It is one of India's oldest universities, as well as the second oldest in Maharashtra.

1.3.2 Accreditation

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

Cycle	First	Second	Third
CGPA	84.25	3.11	3.1
Grade	A	A	A
Year	2003	2011	2016

Table 1: NAAC Accreditation details of the Institute

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

1.3.3 Certification

The College has received the following Certifications

- NIRF – Participated in the National Institutional Ranking Framework.
- AISHE – The All India Survey of Higher Education code is C-18237.

1.4 Infrastructure of the Institute

The college has two Campuses one is situated at Shankar Nagar and another at Seminary Hills. There following infrastructure facilities are available at present:

- *Around 7 Smart (Digitally enabled) classrooms.*
- *Seminar Halls for conducting seminars, association meetings, paper presentations, and various teaching-learning activities.*
- *Library with OPAC, Audio Visual Section for visually impaired students to listen audio books; Abrar the audio book reader is also available for these students. Library is partially*

automated with SOUL 2.0 software at both the campuses.

- *The Shankar Nagar campus has around 14 laboratories for the Faculty of Science like Microbiology, Biochemistry, Biotechnology, Zoology , Applied Electronics, HMCT, Interior Design , Cosmetic Technology provide advanced experiential learning.*
- *The Seminary Hills Campus has around 20 Laboratories with one Research lab which has all modern facilities required for the Research as Brookfield Viscometer, Single Pan, pH Meter, Penetrometer, Spectrophotometer, and Laptop. Department Of HMCT has modern equipment like under counter Refrigerator, Ice machine, bottle cooler rack and display counter with adjustable temperature.*
- *Shankar Nagar campus has one Big Auditorium Justice BhavanishankarNiyogi Hall having accommodation capacity of 1000 students as well an additional Conference Hall (closed auditorium) having capacity of 200 students. Similarly Seminary Hills Campus has D. J. Deshmukh Hall having capacity of 300 students.*
- *Department of Botany has maintained a Botanical Herbal Garden. Department of Zoology & Applied Electronics have started Manure Production unit and managing the garbage generated at both the campuses.*
- *Sports facilities - include – Indoor sports include 1- Gymnasium Hall , 1-Table tennis Table, 3-Carrom, Karate, 1 Electronic Tread Mills, 1 Rowing Machine, 1 Electronic Bicycle , 1 Cross Trainer, Functional Trainer. While the Outdoor sports include - Basketball Court -1, Volleyball Court-1 , Kho-Kho, Court- 1, Kabaddi Ground, Cricket Pitches -2 Half Pitches (1 Cement -1 Mud Wickets)*
- *The Department of History has collection of rare coins.*
- *The Department of Geography has Tracing table, A-View Open access software for virtual meetings and Nagpur district atlas contains nine major maps, two satellite images of Nagpur city of 2005, World Clock, Survey instruments.*
- *The Department of Psychology performs Intelligence testing, Personality testing for students and Aptitude testing for junior college students and on the basis of aptitude guidance is provided for selection of further studies also personality testing is also carried out Clinical testing like anxiety, stress, and depression .The testing tools are approved by American Psychological Association.*
- *The college cafeteria at both the campuses caters hygienic food to staff and students. The canteen works under supervision of Canteen Committee and Health Committee. The food menu and the rate are decided by the Canteen Committee.*
- *There are Hostel facilities for outside girl students in the premises of both campuses.*

2. Institution overview

2.1 Populace analysis for Academic year 2021 – 2022

2.1.1 Students data

The student data (shared by the College) shows there were a total of **2,896 female students** on the premises.

2.1.2 Staff data

Type	Male	Female	Total
Teaching staff	1	54	**55**
Non-Teaching staff	28	35	**63**
Total Staff Members	**29**	**89**	**118**

Table 2: Staff data of the Institution for 2021 - 2022

The staff data shows the premises had a total of **118** Staff Members.

2.2 Populace analysis for Academic year 2020 – 2021

2.2.1 Students data

The student data (shared by the College) shows there were a total of **3,123 female students** on the premises.

2.2.2 Staff data

Type	Male	Female	Total
Teaching staff	01	64	**65**
Non-Teaching staff	33	38	**71**
Total Staff Members	**34**	**102**	**136**

Table 3: Staff data of the Institution for 2020 - 2021

The staff data shows the premises had a total of **136** Staff Members.

2.3 Total College Area & College Building Spread Area

The **total site area is 30.10 acres** & **total Built-up area of College is 4,83,232 sq. ft. for around 3,014 populace footfalls.**

2.4 College Infrastructure

2.4.1 Establishment

The College was established in 1932.

2.4.2 Spatial Organisation

The College has ample and wide open classes with facilities appropriate for an educational space. There are open spaces with a beautiful entrance approach. The balance of hardscape and softscape provides a landscape serene ambience. **Overall the Infrastructure of the Building is excellent in terms of the Architecture Design.**

2.4.3 Operation and maintenance of the premises

The data collection session was held with the staff regarding the operation and working hours. The schedule is mentions that the College is working Monday to Saturday with timings being 07:00 hours to 16:00 hours.

3. Green Building Study as a Research based technical audit

3.1 About the Green Building Study Audit

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

3.2 Analysis of the Green Building Study Audit

The procedure included detailed verification for the following:

Energy Audit

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

Green Audit

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

Environmental Audit

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

3.3 Strategy adopted for Green Building Study Audit

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

3.4 Activities undertaken for the Green Building Study Audit

- Allotment and Initiation by the Institute
- Survey of students and staff completed
- Site visit at the Institute
- Submission of the Certificate

Induction Meeting

Institute: L.A.D. & Smt. R.P. College for Women, Nagpur Date: 10-1-2023
Audits covered: Green, Energy, Environment Day: Tuesday

S. No	Name	Designation	Signature
1.	Mrs. Farida Shaikh	Project Manager	
2.	Ar. Nalida Abdulla	IGBC CFM CP	
3.	Dr. Pooja Pathak	Principal	Pooja Pathak
4.	Dr. Archana Masram	IQAC-coordinator	
5.	Mrs. Maya Jadhao	Incharg-Green Audit	
6.	Ms. Madhavi Gaikwad	member	
5.	Ms. Kanchan Bade	IQAC Coordinator	
6.	Dr. Sugashmie Kaalmegh	Criterion-7-Head	
7.	Dr. Charita Patil	Criterion-7 Head	
8.	Dr. Ashwini Balki	member	
9.	Mrs. Mrunali Malkhede	member	Mrunali
10.	Lalita Renke	member	Mrs. L.P. Renke
11.	Anita Sontakke	member	

L.A.D. & Smt. R.P. College for Women, Nagpur
College Name:
Signature:
Name: Dr. ARCHANA MASRAM
Designation: Coordinator, IQAC
Date: 10-1-2023

For Greenvio Solutions
Signature:
Name: Mrs F. A. Shaikh
Designation: Manager
Date: 10/01/2023

Exit Meeting

Institute: L.A.D. & Smt. R.P. College for Women, Nagpur Date: 10-1-2023
Audits covered: Green, Energy & Environment Day: Tuesday

S. No	Name	Designation	Signature
1.	Mrs. Farida A Shaikh	Project Manager	
2.	Ar. Nalini Abdulla	IGBC; GIMEP	
3.	Dr. Pooja Pathak	Principal	Pooja Pathak
4.	Dr. Archana Masram	IQAC-Coordinator	
5.	Mrs. Maya Tadhao	Incharge-Green Audit	
6.	Ms. Madhavi Gaikwad	Member	
7.	Ms. Kanchan Badle	IQAC-Coordinator	
6.	Dr. Susashmie Kaalmegh	Criterion 7- Head	
7.	Dr. Chasita Patil	Criterion-7- Head	
8.	Dr. Ashwini Balki	member	
9.	Ms. Mrunali Malkhede	Member	mrunali
10.	Lalita Renke	Member	Mrs L P. Renke
11.	Anita Sontakke	member	

L.A.D. & Smt. R.P. College for Women,
College Name: Nagpur
Signature:
Name: Dr. ARCHANA MASRAM
Designation: Coordinator, IQAC
Date: 10-1-2023

For Greenvio Solutions
Signature:
Name: Mrs F. A. Shaikh
Designation: Manager
Date: 10/01/2023

4. Site Study

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

4.1 Actual positive points based on the site visit

The following points are based on the site visit observations:

- Well planned blocks and architectural spaces.
- Eco-friendly buildings as a technical experiment by the students.
- State of the art auditorium
- Well planned roads for internal traffic and circulation
- Heritage buildings within the premises.
- Green building parameters utilised in the new buildings.
- Vegetative cover inside the premises, though this can be improved.

4.2 General positive points

The following points are based on the general observations of discussions:

- **Eliminating the transmission signal inside the premise -** The College has eliminated transmission signal in the interiors to protect ecosystem.
- **OPAC system -** The system in the library is beneficial for the students.
- **Greenery in the indoors -** There are a lot of potted plants inside the premises.

5. Ecological (Environmental) Audit

Environment is an essential part for human survival. We co-exist with the environment and it cannot be termed as a separate entity. The Ecological audit helps to understand the flora, fauna that exists and steps that can be taken to improve the same. To denote if there are problems related to sound in and around the surrounding.

In terms of the carbon footprint it helps in keeping a tab on the eco-friendly habits incorporated by the inhabitants of the premises. Health today is the topmost priority, a general understanding of the initiatives undertaken along with sufficient hygiene practices adopted. Universal design is applicable to all built and unbuilt spaces.

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

5.1 Open Spaces

There is an open space in the premises used by students at present for sports and cultural gatherings. **There are provisions for natural plantations which have enhanced the beauty of the space.**

5.2 Flora and fauna audit

5.2.1 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 constituting hundreds of surveyed trees in premises documented as follows.

S. No.	Plant Name	Type	Nos.
Campus 1 - Shankar Nagar Campus			
1	*Acacia Leucophloea*	Tree	5
2	*Aegle Marmelos*	Tree	2
3	*Abrus Precatorius*	Tree	2
4	*Uraria Picta -*	Herb	2

5	*Bauhinia Acuminate*	Shrub/Tree	2
6	*Parkinsonia Aculeate*	Tree	1
7	*Kalanchoe Pinnata -*	Herb	15
8	*Mimosa Pudica*	Herb	5
9	*Gymnema Sylvestre*	Herb	1
10	*Solanum Nigrum -*	Herb	1
11	*Justicia Adathoda*	Shrub	3
12	*Thunbergia Grandiflora*	Herb	2
13	*Vitex Negundo -*	Shrub	2
14	*Plectranthus Amboinicus -*	Herb	3
15	*Ocimum Sanctum -*	Herb	20
16	*Piper Betle -*	Herb	2
17	*Piper Longum*	Herb	1
18	*Piper Nigrum -*	Climber	1
19	*Euphorbia Tirucalli -*	Shrub	5
20	*Casuarina Equisetifolia*	Tree	1
21	*Ficus Species -*	Shrub	2
22	*Galphimia Gracilis*	Shrub	1
23	*Cissus Quadrangularis*	Tree	2
24	*Hibiscus Rosa-Sinensis*	Shrub	5
25	*Mucuna Pruriens –*	Tree	1
26	*Centella Asiatica –*	Herb	2
27	*Allamanda Cathartica -*	Shrub	4
28	*Catharanthus Roseus -*	Herb	8
29	*Rauvolfia Serpentine -*	Shrub	3
30	*Plumbago Zeylanica*	Herb	1
31	*Jasminum Officinale -*	Shrub	5
32	*Murraya Paniculata -*	Shrub	5
33	*Tinospora Cordifolia --*	Herb	2
34	*Tecoma Stans --*	Tree	5
35	*Clerodendron Splendens --*	Shrub	2
36	*Clerodendron Thompsona*	Shrub	2

37	*Duranta Erecta –*	Herb	50
38	*Oroxylum Indicum --*	Tree	1
39	*Commiphora Wightii*	Tree	1
40	*Clerodendrum Phlomidis*	Herb	6
41	*Cymbopogon Citrate--*	Herb	4
42	*Clematis Sp.--*	Herb	2
43	*Bacopa Monnieri*	Herb	2
44	*Barleria Cristata*	Herb	6
45	*Andrographis Paniculata*	Herb	4
46	*Asparagus Racemosus*	Herb	6
47	*Plumbago Auriculata*	Herb	4
48	*Withania Somnifera*	Herb	5
49	*Solanum Indicum --*	Shrub	6
50	*Artemisia Annua--*	Herb	1
51	*Aloe Indica --*	Herb	8
52	*Phyllanthus Emblica*	Tree	2
53	*Abelia Chinensis*	Herb	4
54	*Bryophyllum Pinnatum*	Herb	30
55	*Asparagus Officinalis*	Herb	5
56	*Mangifera Indica*	Tree	4
57	*Syzygium Cumini*	Herb	1
58	*Phyllanthus Niruri*	Tree	2
59	*Clitoria Ternatea*	Herb	3
60	*Barleria Prionitis*	Tree	6
61	*Boerhavia Diffusa*	Climber	2
62	*Ruscus Aculeatus*	Shrub	2
63	*Annona Squamosa*	Herb	4
64	*Bryophyllum Pinnatum*	Herb	8
65	*Thuja Occidentalis*	Shrub	10
66	*Hibiscus Rosa-Sinensis*	Herb	10
67	*Tradescantia Pallida*	Shrub/Tree	25
68	*Ixora Coccinea*	Shrub	20

69	*Pothos (Scindapsus Aureus)*	Herb	20
70	*Syzygium Aromaticum*	Shrub	1
71	*Musa Paradisiacal*	Climber	1
72	*Bambusa Bambos*	Climber	20
73	*Cypress Sp*	Shrub	1
74	*Nephrolepis Sp.*	Tree/Shrub	3
75	*Tabernaemontana Divaricata*	Tree	4
76	*Curcuma Longa*	Herb	1
77	*Croton Sp.*	Shrub	20
78	*Citrus Limetta*	Herb	13
79	*Crinum Asiaticum*	Herb	1
80	*Impatiens Balsimia*	Tree	5
81	*Nerium Indicum*	Shrub	12
82	*Mirabilis Jalapa*	Herb	10
83	*Gymnema Sylvestre*	Shrub	1
84	*Myristica Fragrans*	Herb	1
85	*Zamia Skinneri*	Herb	1
86	*Azadiracta Indica*	Tree	10
87	*Psidium Guajava*	Tree	12
88	*Cinnamomum Tamala*	Tree	1
89	*Mimusops Elengi*	Tree	1
90	*Polyalthiya Longifolia*	Tree	25
91	*Tectona Grandis*	Tree	40
Total			**574**
Campus 2 - Seminary Hills Campus			
1	*Lebek Tree*	Tree	2
2	*Acasia*	Tree	1
3	*Amla*	Tree	2
4	*Ashoka*	Tree	10
5	*Sausage Tree*	Tree	3
6	*Badaam*	Tree	6
7	*Bael*	Tree	1

8	*Banyan*	Tree	2
9	*Bauhinia*	Tree	4
10	*Ber*	Tree	12
11	*Bottle Brush*	Tree	2
12	*Butea / Flame Tree*	Tree	10
13	*Teak*	Tree	150
14	*Casuarina*	Tree	4
15	*Copper Pod*	Tree	10
16	*Custard Apple*	Tree	10
17	*Drumstick*	Tree	6
18	*Eucalyptus*	Tree	10
19	*Frangipani*	Tree	25
20	*Golden Champa*	Tree	5
21	*Guava*	Tree	15
22	*Indian Rosewood*	Tree	15
23	*Indian Fig Tree*	Tree	10
24	*Indian Cork Tree*	Tree	10
25	*Jamaica Cherry*	Tree	3
26	*Juniper*	Tree	3
27	*Lime*	Tree	50
28	*Malabar Plum*	Tree	8
29	*Mango*	Tree	40
30	*Manilla Tamarind*	Tree	6
31	*Milea / Bead Tree*	Tree	4
32	*Neem*	Tree	30
33	*Orange*	Tree	40
34	*Palm*	Tree	20
35	*Pride Of India*	Tree	5
36	*Royal Poinciana*	Tree	10
37	*Rubber*	Tree	4
38	*Sacred Fig*	Tree	6
39	*Sago Palm*	Tree	2

40	*Sandalwood*	Tree	2
41	*Senna Or Cassia (Old)*	Tree	8
42	*Soapnut*	Tree	4
43	*Spanish Cherry*	Tree	10
44	*Tamarind*	Tree	6
45	*Tecoma*	Tree	10
46	*The Indian Laburnum*	Tree	10
47	*The Rain Tree*	Tree	4
48	*Tree Of Heaven*	Tree	4
49	*White Cedar*	Tree	4
50	*White Lead Tree*	Tree	4
51	*Adenium*	Tree	4
Total			**626**

Table 4: Details of the Flora in the premises

At present there are more than 1,200 numbers of plantations comprising of plants, trees, shrubs. Timely maintenance with sufficient care has resulted in positive benefits for the surroundings.

5.2.2 Fauna Audit

The details of the fauna in the premises are documented below.

S. No.	***Local names***	***Scientific Names***
1	*SPIDERS*	*Myrmachne orientalis (Family Salticidae); Nephila plipes (Family-Nephilidae); Heteropoda sp (Family-Sparassidae);Phintella vitatta (Family Salticidae)*
2	*MOTHS & BUTTERFLIES*	*Antheria assmensis;Bombyx mori;Philosamia ricini; Junonia atlites atlites; Commander (Moduza procris procris); Ethope himachala; Melanitis leda leda; Paltoporia paraka paraka; Ypthima baldus; Acraea terpsicore; Elymnias hypermnestra undularis; Mycalesis perseus blasius; Tanaecia lepidea lepidae; Euploea core core*

3	*OTHER INSECTS*	*Apis indica; Apis dorsata; Apis florae, Crocothemis erythraea (Scarlet dragonfly); Pantala flavescens (wandering glider)*
4	*AMPHIBIANS*	*Duttaphrynus melanostictus (Assian common toad), Leptobrachium smithi; Fejervarya pierrei; Hoplobatrachus tigerinus; Hylarana tytleri; Humerana humeralis; Hylarana leptoglossa; Polypedates leucomystax.*
5	*REPTILES*	*Calotes versicolor; Hemidactylus frenatus; Hemidactylus brookii; Hemidactylus platyurus; Hemidactylus flaviviridis; Gekko gecko; Eutropis multifasciata; H. Sphenomorphus maculates Enhydris enhydris; Xenochrophis schnurrenbergeri; Xenochrophis cerasogaster; Rhabdophis subminiatus; Amphiesma stolatum; Chrysopelea ornate*
6	*BIRDS*	*Acridotheres tristis (Common myna); Streptopelia orientalis (Oriental Turtle Dove); Athene noctua (little owl); Pycnonotus cafer (Redvented Bulbul)*
7	*MAMMALS*	*Macaca mulatta (The rhesus macaque); Sciurus carolinensis (Eastern gray squirrel); Pteropus giganteus (The Indian flying fox)*

Table 5: Details of the fauna in the premises

5.3 Noise Audit

5.3.1 Macro level

On a macro level the College being an educational institute falls under silent zone and thus **there is no negative effect related to noise felt by the students / staff in the premises.**

5.3.2 Micro level

The College has ample vegetation trees. These act as a noise barriers. There are no particular equipments which cause any noise effect. **Overall the noise levels inside the premises are low that is a good approach.**

5.4 Carbon Footprint Audit

5.4.1 Eco-friendly Commuting Practices

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

- Owing to close proximity to public transport the accesses is feasible and walk able.
- There are wide roads and appropriate traffic management inside the premises.
- There are dedicated areas for parking around each block.

5.4.2 Heat Island Reduction

The Institution is geographically located in an urban area with appropriate climatic and architectural design parameters in place; the Institute does not face any 'Urban heat island effect'

5.4.3 Outdoor Light Pollution Study

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

5.5 Universally accessible premises

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

- **Ramps at the entrance area.**
- **Handrails along the staircase and Low height risers in the staircases.**
- **Availability of wheelchair.**
- **Audio Visual Section for visually impaired students to listen audio books; Abrar the audio book reader is also available for these students.**

The design of the premises is appropriate for access with passages and corridors being wide enough in size and naturally ventilated and are safe from the fire safety aspect.

5.6 Fire Safety

Our observation states that the current measures are adequate however; an additional fire extinguisher in every space that has an air-conditioner will be beneficial.

5.7 Positive site features

5.7.1 Based on our study

a) Paperless technologies

The college has gone technology-friendly and paperless in the functioning of the Premises.

b) Avoid using plastic in premise

There are provisions for a ban on the use of plastic bags or products on the Premise.

c) Ample greenery

There are provisions for the garden and plenty of traditional trees on the premises.

d) Breakout zones

There is availability recreational and breakout zones for the students.

5.7.2 Based on survey study

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

5.7.2.1 Survey participation

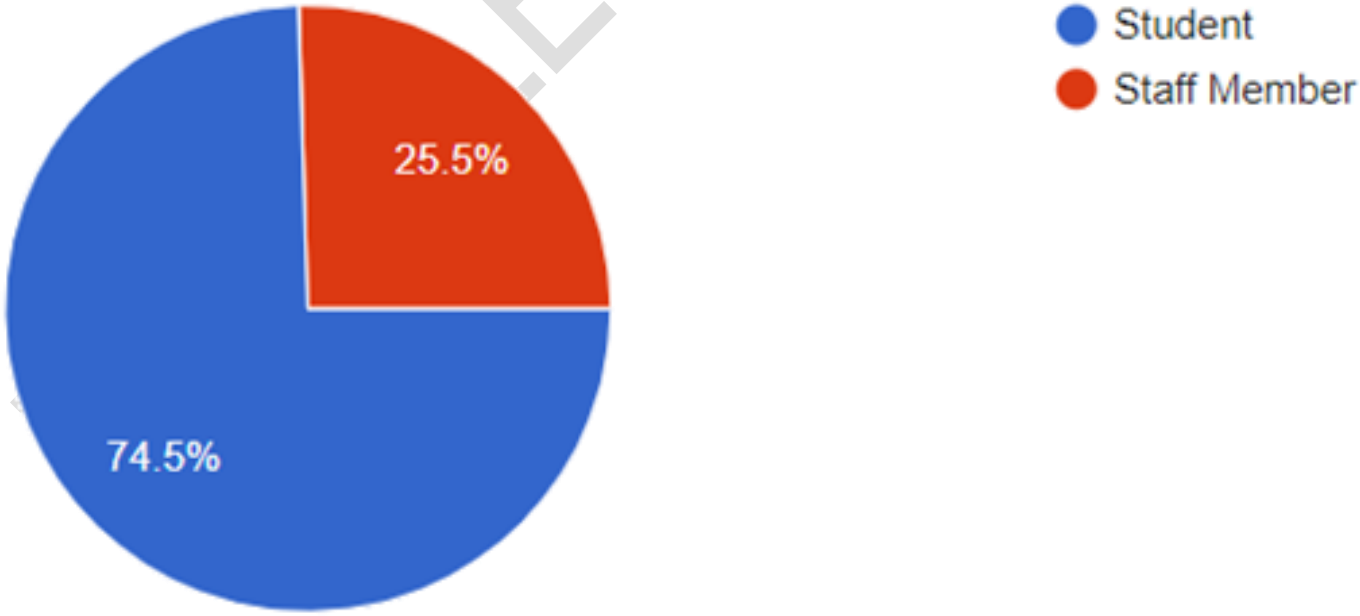


Figure 1: Participation analysis in the survey

A total of **102 responses** were received out of which 75% were students.

5.7.2.2 Survey review

Some of the key reviews as per the responses received are listed below.

- Increasing tree cover , Nesting birds awareness, minimising plastic usage, fostering caring towards fauna and flora .
- Non concrete flooring allowing water seepage in ground.
- College has installed main switches outside every classroom to turn off all lights at one go.
- Lots of trees are observed in the campus. Cutting n cleaning is observed sometimes.
- Started Manure Production, organised various awareness programs, Initiated Green audit
- Students clubs are made which look after such maintenance.
- Educate students about green environment
- The maintenance is good and baby steps are being taken up for green building.
- Plantations, daily garbage collection, cleaning of college daily
- According to me the positive steps taken by the institute towards green building/good maintenance is that every is to followed with the rules and regulations. The institute takes all the responsibility of green building and the good maintenance of it.
- Organizing seminars and spreading awareness among students
- Daily watering the plants good garbage management
- Regular cleaning and maintaining classroom and other utilities

5.8 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 1.5 to 2.5 years from the date of the Report submission.** The Institute can execute a plan after discussion with Project Head.

5.8.1 Pollution Control

a) **Specific area designated for E-vehicles** – There should be designated area dedicated to E-vehicles parking and charging and this zone should be demarcated as 'Eco-Zone'

b) **Promote the use of Eco-friendly vehicles -** There can be provision for eco-friendly and battery-operated vehicles/ low emission vehicles for internal circulation. These could be used as a course of public transport inside the premises.

c) **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.

d) **Plant more carbon dioxide absorbing plants** - The following plantations should be planted as they will help in Carbon neutralisation.

- *Pine – It is known for its ability to sequester carbon.*
  (https://www.single.earth/blog/which-trees-absorb-the-most-carbon#:~:text=Pine%20trees%20as%20carbon%20sinks,their%20ability%20to%20sequester%20carbon.&text=These%20trees%20are%20found%20in,also%20make%20good%20landscape%20plants)
- *Neem – It helps to reduce greenhouse gases through photosynthesis absorbing large quantities of CO_2 and producing oxygen.*
  (https://neemfoundation.org/greening-india-with-neem/#:~:text=The%20planting%20of%20Neem%20trees,of%20CO2%20and%20producing%20oxygen)
- *Peepal – It can uptake CO_2 during the night as well because of its ability to perform a type of photosynthesis called Crassulacean Acid Metabolism (CAM)*
  (https://nurserylive.com/blogs/sustainable-living/do-you-know-plants-that-give-oxygen-24-hours#:~:text=2.-,Peepal,Crassulacean%20Acid%20Metabolism%20(CAM))
- *Bamboo - It can absorb as much as 12 tonnes of carbon dioxide per hectare per year, giving the plant a potentially crucial role in stabilising our planet's atmosphere.*

(https://www.theguardian.com/environment/2003/mar/20/research.science#:~:text=Research%20in%20Japan%20and%20elsewhere,in%20stabilising%20our%20planet's%20atmosphere) and https://www.nelda.org.in/15-indian-trees-that-produce-the-most-oxygen

- *Teak – It has the highest capacity for carbon sequestration among trees in India. This is the finding of a study conducted by the Gujarat Ecological Education and Research (GEER).*

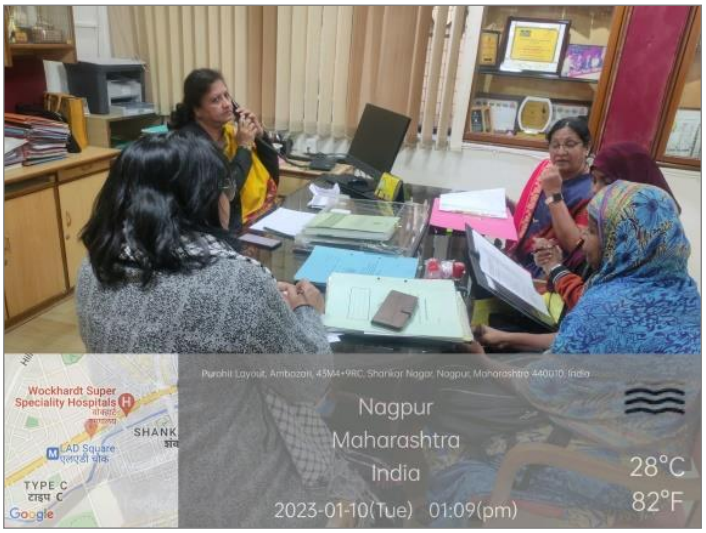
(https://timesofindia.indiatimes.com/city/ahmedabad/teak-absorbs-max-co2-from-air-helps-check-global-warming/articleshow/51721842.cms)

5.8.2 Universally accessible premises

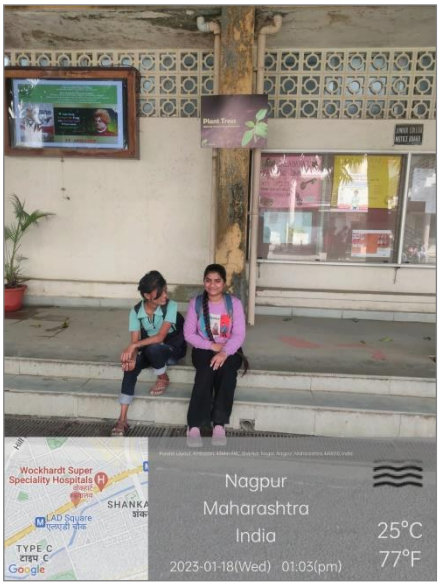
Universal Toilet - There should be a minimum of 1 toilet for the specially-abled people as per guidelines prescribed by the National Building Code 2016 with size being a minimum of more than 1.5m x 1.5m

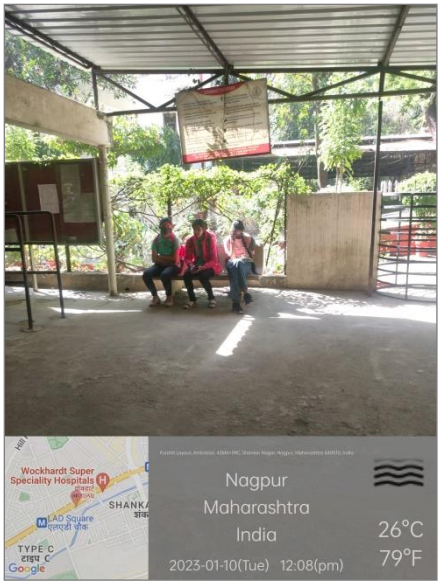
5.8.3 Fire and Life safety

- Every space which has a gas cylinder or combustible equipment should have a provision for additional safety including the barricade around the gas cylinders, appropriate safety boards.
- Every laboratory space should have both sand bucket and fire extinguisher.
- A fire drill and safety evacuation drill should be undertaken every 6 months for students and staff.
- One fire extinguisher in every space which has an air conditioner and in the immediate spaces outside the lift areas.
- 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.



Discussion with the Core Team





On-site review with the team for site management and other features

6. References

The study is based on the data collected, analysed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyse and study the data collected.

7.1 National references

- Uniform Plumbing Code – India, 2008
- IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- IGBC Green Landscape Rating system, March 2013

7.2 International references

- BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
- Used only for understanding Universal design - Universal Accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National center for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation and www.umassd.edu
- The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- Streetscape elements – Chapter 6 on San Francisco
- American lung association https://www.lung.org/
- Study related to air pollution https://www.airgle.com/
- Exploring the light pollution https://education.nationalgeographic.org/
- Accessibility study https://www.washington.edu/
- Urban heat island effect https://www.epa.gov/heatislands/what-you-can-do-reduce-heat-islands
- https://www.epa.gov/heatislands/learn-about-heat-islands
- https://earthbound.report/2021/07/14/5-ways-to-reduce-the-urban-heat-island-effect/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