

# GREEN 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. Ratnadevi Purohit College of  
Home Science and Home Science Technology**  
Shankar Nagar, Nagpur – 440010, Maharashtra, India

**Studied in the capacity of**  
**Accredited Green Building Professional**  
with the Indian Green Building Council



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

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

Background reference image Sasin Tipchai on unsplash



### Inferences of the Site visit

Audit conducted by : Nahida Shaikh, IGBC AP, GEM CP, Architect  
 Accredited and Certified Green Building Professional

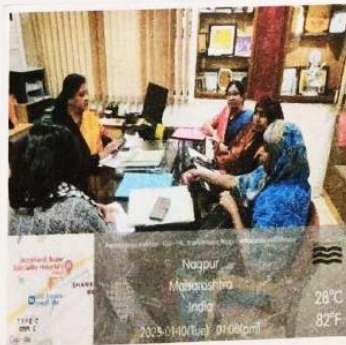
ASSOCHAM GEM Certified Professional Registration number 22/718

Link for the Verification website [https://www.green-assocharm.com/manage\\_gem\\_cp.php?page=12](https://www.green-assocharm.com/manage_gem_cp.php?page=12)

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

Observations	Inferences
<ul style="list-style-type: none"> <li>- Immense initiatives related to environment</li> <li>- plastic ban, compost, bio toilet,</li> <li>- xeriscaping,</li> <li>- NO Vehicle zone/ Botanical</li> </ul>	<ul style="list-style-type: none"> <li>- Include smart lighting/landscape</li> <li>- Increase awareness posters/signage</li> <li>- solar - parking</li> <li>- awareness on compound wall.</li> </ul>

#### Evidence of the site visit



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



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

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



# 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. Ratnadevi 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

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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 Green 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

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# 1. Introduction

## 1.1 About the Institution

The Lady Amritbai Daga College for Women of Arts, Commerce & Science and Smt. Ratnadevi 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
<b>CGPA</b>	84.25	3.11	3.1
<b>Grade</b>	A	A	A
<b>Year</b>	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	<b>55</b>
Non-Teaching staff	28	35	<b>63</b>
<b>Total Staff Members</b>	<b>29</b>	<b>89</b>	<b>118</b>

*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	<b>65</b>
Non-Teaching staff	33	38	<b>71</b>
<b>Total Staff Members</b>	<b>34</b>	<b>102</b>	<b>136</b>

*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 Date: 10-1-2023  
Nasapur  
 Audits covered: Green, Energy, Environment Day: Tuesday

S. No	Name	Designation	Signature
1.	Mrs. Farida Sheikh	Project Manager	
2.	Dr. Nalida Abdulla	IGOsL Co-FMCP	
3.	Dr. Pooja Pathak	Principal	
4.	Dr. Archana Masram	IGAC-coordinator	
5.	Mrs. Maya Jadhao	Incharge Green Audit	
6.	Ms. Madhavi Gaikwad	member	
5.	Ms. Kanchan Bade	IGAC Co-coordinator	
6.	Dr. Surashmie Kadam	Criterion-7-Head	
7.	Dr. Charita Patil	Criterion-7-Head	
8.	Dr. Ashwini Balkaji	member	
9.	Mrs. Mrumali Malkhede	member	
10.	Lalita Renke	member	
11.	Anita Sontakke	member	



L.A.D. & Smt. R.P. College for Women,  
 College Name: Nasapur  
 Signature:   
 Name: Dr. ARCHANA MASRAM  
 Designation: Coordinator, IGAC  
 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 Ashikh	Project Manager	<i>[Signature]</i>
2.	Dr. Nalini Abdulla	IGBL; GMEP	<i>[Signature]</i>
3.	Dr. Pooja Pathak	Principal	<i>[Signature]</i>
4.	Dr. Archana Masram	IBAC-COORDINATOR	<i>[Signature]</i>
5.	Mrs. MARYA TADHAO	Incharge-Green Audit	<i>[Signature]</i>
6.	Mrs. Madhavi Gaikwad	member	<i>[Signature]</i>
7.	Mrs. Kamdhan BADE	IBAC-COORDINATOR	<i>[Signature]</i>
6.	Dr. Susashmie Kaalmesh	Criterion-7-Head	<i>[Signature]</i>
7.	Dr. Charita Patil	Criterion-7-Head	<i>[Signature]</i>
8.	Dr. Ashwini Balki	member	<i>[Signature]</i>
9.	Mrs. Mumali Malkhede	member	<i>[Signature]</i>
10.	Lalita Renke	member	<i>[Signature]</i>
11.	Anita Santakke	member	<i>[Signature]</i>

L.A.D. & Smt. R.P. College for Women,  
College Name: Nagpur  
Signature: *[Signature]*  
Name: Dr. ARCHANA MASRAM  
Designation: COORDINATOR, IBAC  
Date: 10-1-2023

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



## 4. Green Practices Audit

The increasing global warming and climate change have made us realise that apart from the enormous strategies the individual small efforts need to be taken by individuals and Educational Institutes as the younger generations are the future of the world and once they are taught about these practices only then can we assume a better future.

### 4.1 Green practices

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

- ➔ **Energy management** – *More than 50% of the premises has LED Lights.*
- ➔ **Waste management** – *Bio toilet in the Shankar nagar campus; initiatives undertaken towards green chemistry practices; Availability of the compost pit.*
- ➔ **Garden committee** – *The College has a distinguished garden committee who is responsible for the beautification for the premises. This team undertakes a lot of activities related to the enhancement of the landscape features of the premises. As part of our research what we observed as the best feature was the involvement and enthusiasm of each member in this activity.*
- ➔ **Social awareness** - *The College has taken up awareness drives on various social issues for rural upliftment and regeneration in the college and surrounding villages.*
- ➔ **Fresh environment** – *The College provides an eco-friendly ambience with fresh air and soothing environment which helps to maintain a physical and mental balance. This kind of a space it a must for an educational specially technical institute which is inviting and gives the stakeholders an opportunity to explore indoor and outdoor learning to a great extent.*
- ➔ **Team work** – *The best quality of the College which sets it apart from other institutes is its coordinating and cooperative staff members, as for a building the foundation plays the most important role for its future similarly for an educational institute its staff members do.*



## 4.2 Community Development

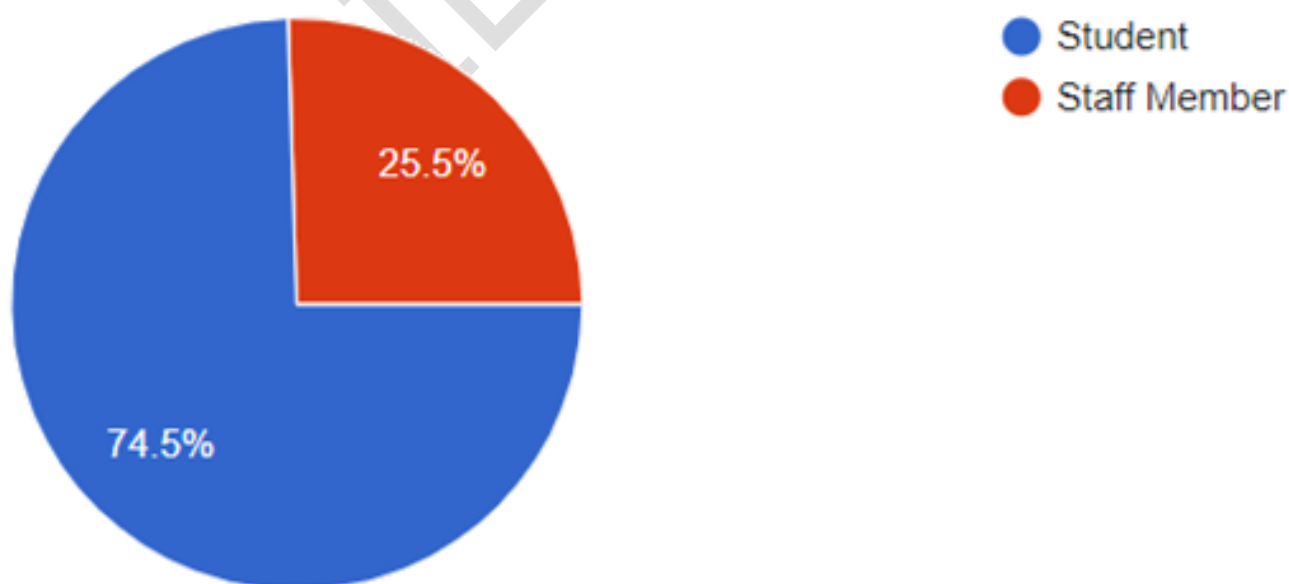
The NSS; NCC Unit of the College is involved in multiple community development programs which include, **Blood Donation Camp, Food Kit Distribution Program to the neighbourhood community, Relief fund programs.** Some of the key events are documented below:

- ➔ *50 NSS Volunteers enthusiastically participated in the Tree Plantation programme on 13 July 2018 at the adopted village Pipaldhara;*
- ➔ *35 NSS Volunteers along with Programme Officers, Ms. Varsha Bhujbal and Mrs. Maya Meshram participated in University Level Tree Plantation Programme on 3 July 2018*
- ➔ *Tree Plantation activity was carried out where 75 Gulmohar and Neem trees were planted around the campus of Women's Technical Education and Research Institute, Seminary Hills campus on 19 July 2018.*

## 4.3 Survey Results

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

### 4.3.1 Participation



*Figure 1: Participation analysis in the survey*

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



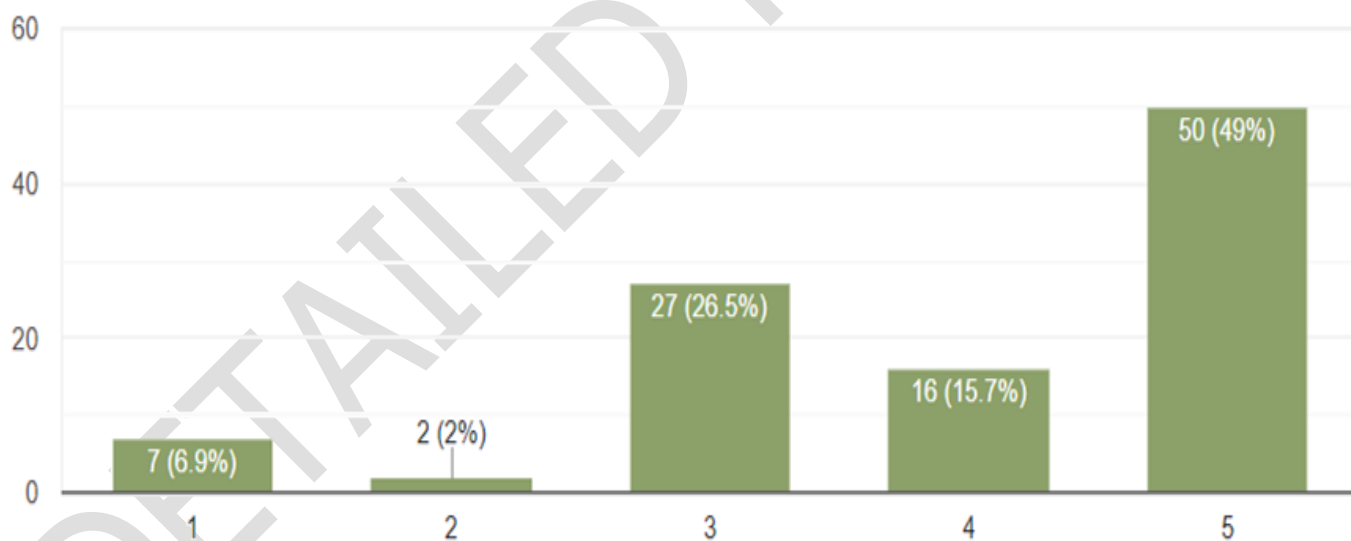
### Note about the review-rating survey

The Participants were asked to review (Though an online mode) the practice on a scale of 1-5 with scale components as follows:

- ➔ Scale 1 – Poor
- ➔ Scale 2 – Satisfactory
- ➔ Scale 3 – Good
- ➔ Scale 4 – Very good
- ➔ Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)

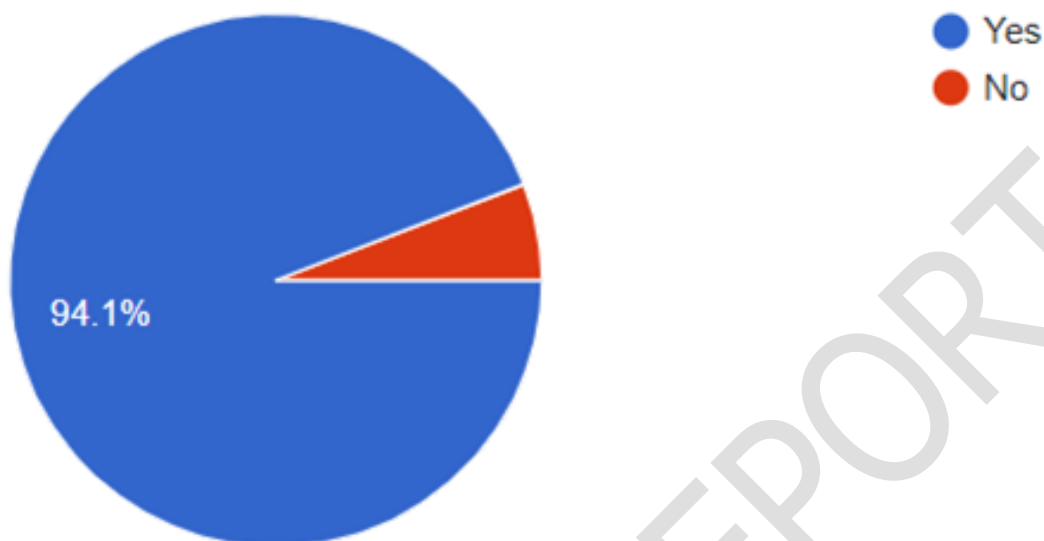
#### 4.3.2 Rate the Green awareness practices in College



*Figure 2: Green awareness practices in College*

There were mixed responses received the highest was for **rating 5 (Excellent) at 49%** followed by **16% for rating 4 (Very good)**.

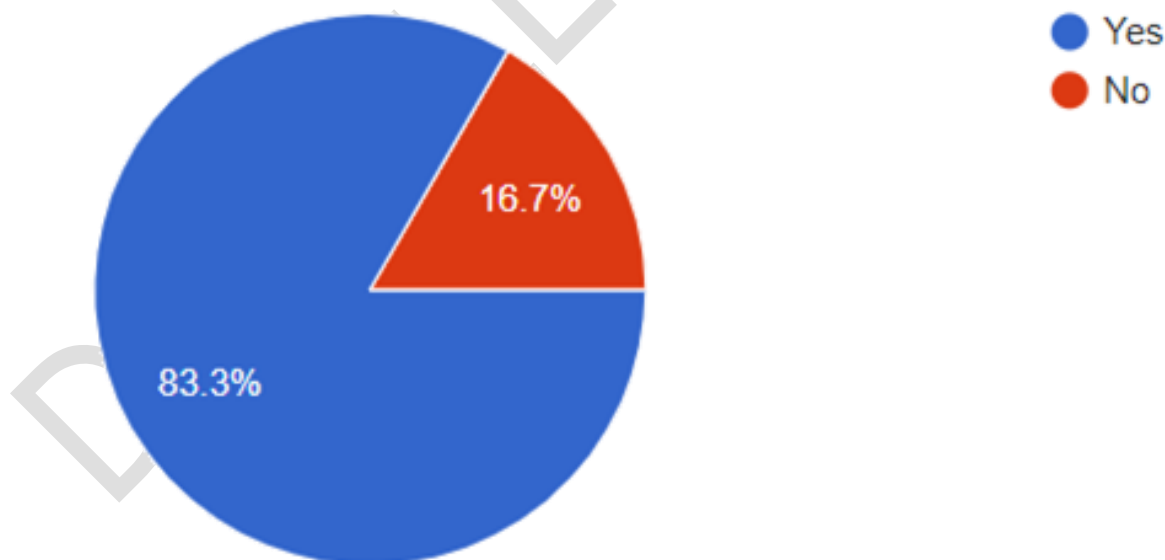
### 4.3.3 Does your College conduct environment awareness programs/ webinars/ plantations/ cleanliness or similar programs?



*Figure 3: Confirmation of the environment awareness programs/ webinars/ plantations/ cleanliness or similar programs conducted by the College*

The students, staff **94%** of responses confirmed that the activities are conducted this is excellent.

### 4.3.4 Do you participate in such events?



*Figure 4: Participation in the environment awareness programs/ webinars/ plantations/ cleanliness or similar programs conducted by the College*

The students, staff **almost 83%** of the responses confirmed their participation, **this is an excellent response.**

## 4.4 Eco-friendly initiatives undertaken

The Institution has undertaken the following initiatives through **excellent efforts** towards save environment measures.

### 4.4.1 Physical events

- ➔ **Tree Planation Programme** on 26 January 2021
- ➔ **Catch the rain online pledge certificate** during May 2021
- ➔ **Ground Water Knowledge and Training Programme** on 19 July 2021
- ➔ **Tree plantation** on 01 February 2022
- ➔ **Eco bricks workshop** on 26 March 2022
- ➔ **Tree Plantation** on 04 September 2022
- ➔ **Rain water recharge at L.A.D. College and PGTD Hostel premises at Gandhi Nagar** during the month of July 2022

### 4.4.2 Virtual events

**Department of Zoology organized an Online Quiz on Wildlife Awareness** on 1-8 October 2021

## 4.5 Suggestions related to section 'Green practices audit'

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.

### a) Environmental awareness

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

### b) QR codes on the plants mentioning scientific names

The practice of having the codes with details of each plant and tree will provide awareness among the staff and students.

## 5. Waste Audit

Waste is an inevitable part of our lives. Over the years as the awareness about waste management techniques has given a rise to rethink how the waste can be avoided from being sent to the landfills.

The audit provides an approximation of the types of waste generated, location of waste collections, disposal techniques used, waste segregation methodologies adopted, waste management strategies that are and implemented in addition to the newer ways the can be adopted aiming to make the premise clean and sustainable.

Here sustainable refers to a broader aspect to analyse whether the current techniques are having positive or negative effect on the stakeholders of the premises.

### 5.1 Waste produced and managed

#### 5.1.1 Solid waste management

- Dustbins are placed in every classroom and at different locations of the campus.
- **Colour coded dustbins, according to international standards are used for different types of wastes.**
- Waste collected on a daily basis from campus, hostel, and class rooms is segregated at source.
- Waste from the hostel and canteen is processed in the manure production unit 140 kg of manure was harvested and marketed in 2018-19.
- **Two paper shredding Machines are installed on both the campuses one in the Shankar Nagar office and one in the library**
- Daily garbage collection and disposal mechanism is integrated with the city municipal mechanism for further processing.

#### 5.1.2 Liquid waste management

- **The waste water from canteen is used for watering trees and for non-potable usage.**



- **Biotoilet is installed in Commerce building to minimize waste.**
- **During 2017-18 & 2018-19, a 6 week course on 'Water conservation right to safe and clean water' was conducted under the aegis of Jiwan Shikshan Abhiyan, RTMNU.**
- A 12 week course in 2018-19 on 'Water Conservation and Water Audit' was conducted under the aegis of Jiwan Shikshan Abhiyan, RTMNU.
- **National aqua conference on "Water Conservation: Role of Educators" was organized.**
- A household survey on water was conducted for Nagpur City by staff and students and findings were presented.
- Sensitizing students and public by participation in Aqua awareness rally was initiated.
- **Lecture on Rainwater harvesting and ground water management was organized by inviting experts.**
- **Yearlong programs were organized on the theme of water conservation. Various intercollegiate competitions were organized like poster making, slogan competition, aqua video, model making for school students.**
- Street play competition was held at different areas to sensitize the importance of water conservation.

### 5.1.3 Waste recycling systems

- **On 11.10.2017, a waste management unit was started in the college premises to produce compost manure from the canteen solid waste and waste from other sources.**
- **The Chemistry department contributed for reduced use of chemicals by using micro- techniques.**
- **The Microbiology Department disposes micro-biological waste by neutralizing /sterilizing it before disposing in the municipal drainage**

**system.**

- ⇒ Old monitors, CPUs are repaired and reused.
- ⇒ **The departments of Family Resource Management and Interior Design carry out “Best out of Waste” activities to use the waste generated.**

#### **5.1.4 E-waste management:**

- ⇒ **The E-waste like empty toners, cartridges, out-dated computers and electronic items are collected, stored and disposed every year according to international disposal procedures.**

## **5.2 Waste management**

*There are Small-sized, medium-sized and large-sized dustbins made of plastic material available at present in a total of 101 nos. in the interiors and 34 nos. in the exteriors.*

## **5.3 Survey Results**

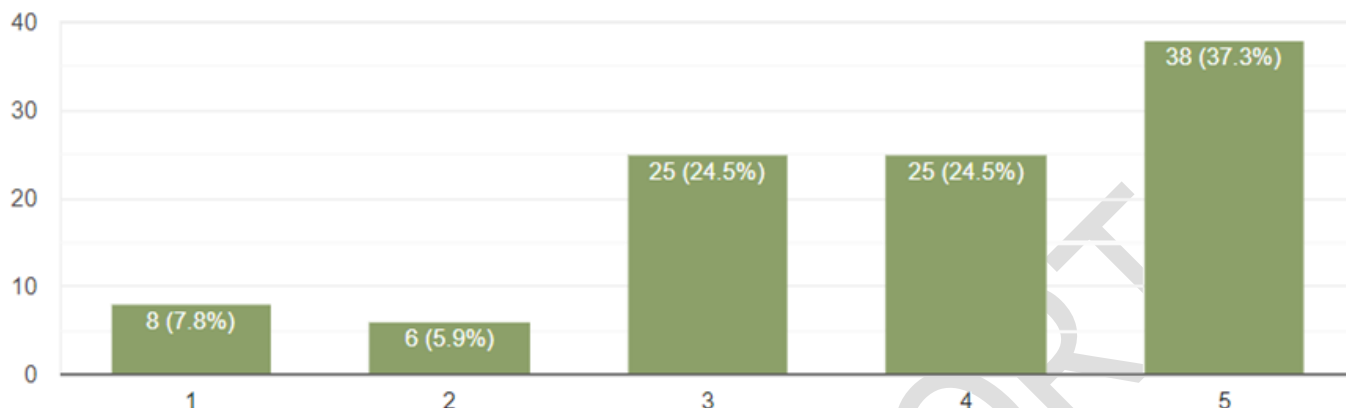
### **Note about the review-rating survey**

The Participants were asked to review (Though an online mode) the practice on a scale of 1-5 with scale components as follows:

- ⇒ Scale 1 – Poor
- ⇒ Scale 2 – Satisfactory
- ⇒ Scale 3 – Good
- ⇒ Scale 4 – Very good
- ⇒ Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)

**Rating for the views regarding the Waste management practices adopted in College, following is the result received.**



*Figure 5: Waste management practices in College*

There were mixed responses received the highest was for **rating 5 (Excellent) at 37%** followed by **25% for rating 4 (Very good)**.

#### **5.4 Suggestions related to section 'Waste Audit'**

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.

##### **a) Twin Dual Litter Dustbin Bins**

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

##### **b) Signages**

Messages about avoiding wastage should be placed at appropriate locations.

##### **c) Dustbins at every 100m**

There should be a dustbin at every 50-100 in the open spaces

##### **d) Material of the dustbin**

The current plastic dustbins should be replaced with eco-friendly material.

## 6. Water Audit

Water is one of the basic needs. Pure drinking water is a resource which needs to be preserved efficiently. Water audit helps to identify the sources of water consumption, the water requirement by the premises met by these sources. The points and effective usage of without any wastage. Understanding the techniques which are best suited to the site to increase water conservation in terms of awareness and practice.

### 6.1 Water availability and consumption

#### 6.1.1 Sources of Primary water supply

**The primary water supply refers to the drinking water.** The main source of water is the Local Municipality. The water received is stored in water tanks at various locations. These are periodically cleaned and well maintained for hygiene purpose. **At present there are multiple water tanks in each block which suffices for entire premises.**

#### 6.1.2 Sources of Secondary water supply

**The secondary source of water is the source of water supply available through wells which is used for wash basin, kitchens, and toilet purposes.** **At present there is 1 well available on site.**

#### 6.1.3 Sources of Tertiary water supply

**The tertiary source of water is the additional source of water harvesting.** **At present there is natural rain water harvesting practiced to increase recharge of groundwater by capturing, by rainwater harvesting from rooftop run-offs; collected water from rooftop was discharge in well.**

### 6.2 Water requirement

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

- **Drinking water** – Consumption of around 850-950 litres of water through Aquaguard like system available in the premise, the taps and water cooler.
- **Toilet blocks**– General usage by occupants in toilets, urinals, bathrooms, wash basins using approx. 400-600 litres of water daily.

- **Cleaning of the premises** – The entire Institution is very well maintained with respect to hygiene and cleaning is one of the major uses of water requirement. The toilet areas are cleaned twice on a daily basis.
- **Garden and surrounding open space** – Cleaning, watering the plants requires approximately 500 litres of water.

### 6.3 Areas of water usage

Based on the inventory done and data shared by the staff it was found that the premise has the following facilities:

- Urinals – 10 Nos.
- Toilets – 74 Nos.
- Wash basins – 191 Nos.
- Taps (Indoors) – 236 Nos.
- Taps (Outdoors) – 40 Nos.

**As per the data shared by the College and on site observation, it was noted that there is no water wastage of water in the form of Cleanliness of toilets.**

### 6.4 Site investigation about water management.

**The College has an excellent management system which is very appreciable. We have observed the following points.**

- There is **no water leakage in the entire premise;** the pipes are well maintained with adequate hygiene.
- **The premise has an efficient water management in terms of operations and maintenance.** The toilets are kept very tidy and are cleaned every day.
- The **waste water does not mix with ground water and gets directed to storm water drains.** There are sufficient numbers of taps in the premise.



## 6.5 Survey Results

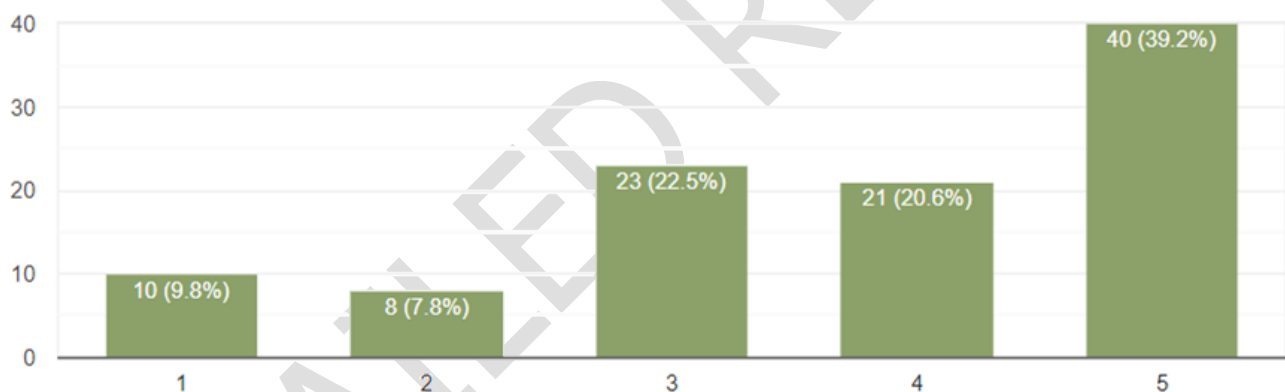
### Note about the review-rating survey

The Participants were asked to review (Though an online mode) the practice on a scale of 1-5 with scale components as follows:

- ➔ Scale 1 – Poor
- ➔ Scale 2 – Satisfactory
- ➔ Scale 3 – Good
- ➔ Scale 4 – Very good
- ➔ Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)

**Rating for the views regarding the Water management practices adopted in College, following is the result received.**



*Figure 6: Water management practices in College*

There were mixed responses received the highest was for **rating 5 (Excellent) at 39%** followed by **21% for rating 4 (Very good)**.

## 6.6 Suggestions related to section Water audit'

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.

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

## 7. Health and Hygiene Audit

The hygiene is a part and parcel of our daily life. It is extremely essential to keep the surroundings clean in the same manner as we would want our houses to be. Educational Institutes have a bigger role to play in order to affect the young minds in the positive manner through better hygienic practices.

### 7.1 Facilities available

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

### 7.2 Smoke Exposure

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

- The College has No Smoking signages in premises as part of the awareness.
- The Institution is a tobacco and smoke free premises which helps in adapting to a Healthy Institution

### 7.3 Hygiene

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

- For overall hygiene of the students and staff there are facilities such as Washroom facility on ground floor, hand wash. The hygiene of toilet areas is well maintained.
- The staffs keep a regular check about the operation and maintenance of the equipments each floor.
- Water management initiative with appropriate hygiene is undertaken. The areas of water tanks in site on ground floor are clean and no mosquito breeding spots are there.

### 7.5 Suggestions related to section 'Health and Hygiene'

**The existing facilities are excellent and no suggestions are required for this section.**

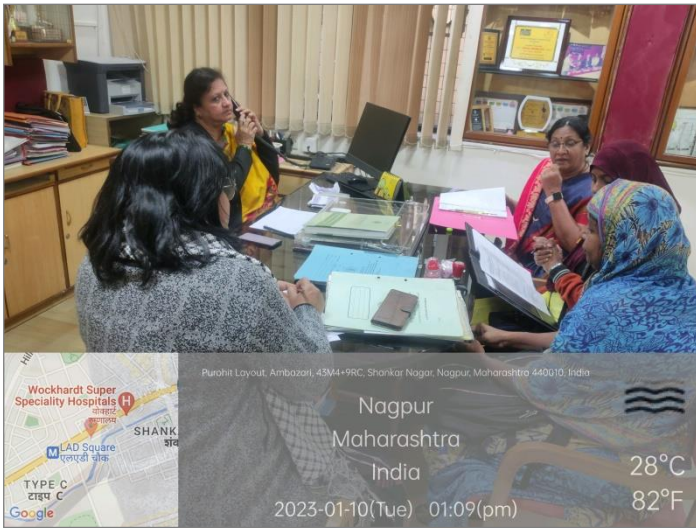
## 8. Inferences as a consolidated study

The following suggestions are to be considered as a **second priority** for implementation. These **should be executed within the next 2.5 to 3.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

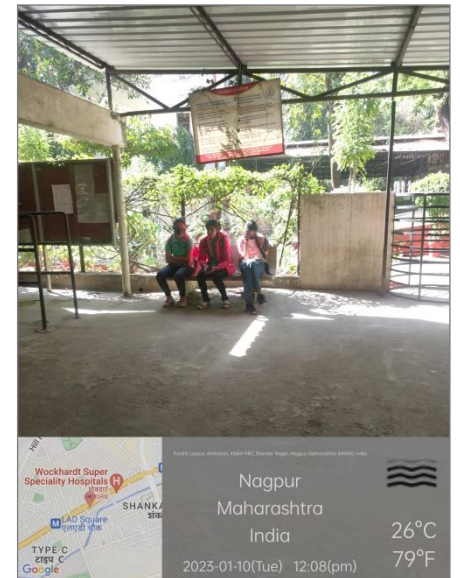
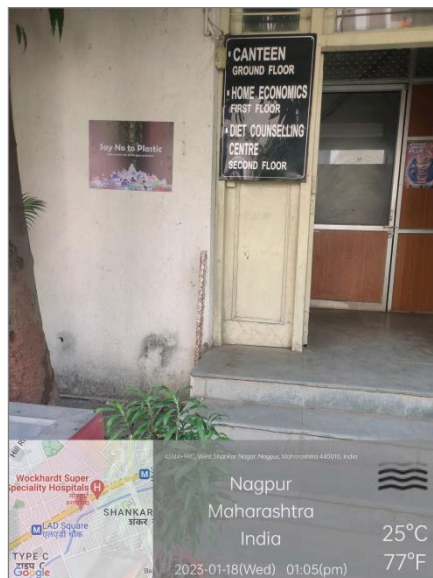
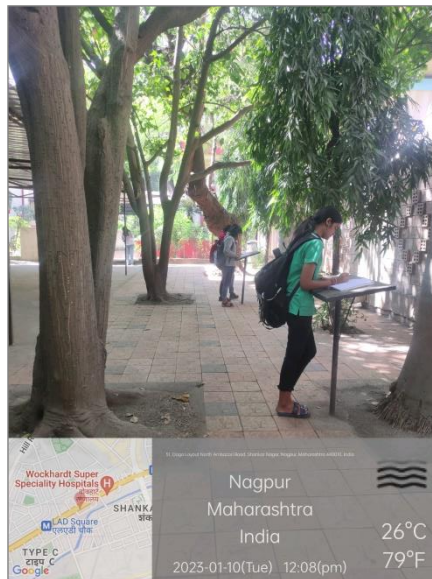
- ➔ **Cutlery in the Canteen** – The regular plastic and steel plates, and spoons used in Canteen can be replaced with eco-friendly and organic leaves, paper straws, disposable plates, edible spoons, and tables made out of sugarcane waste or bamboo. This will be the first of its kind initiative to be adopted and practiced thus also inculcating healthy practices in students.
- ➔ **Terrace farming (Applicable only for the buildings with a flat roof)** - There can be the provision of terrace farming in a designated area of the open space this would enhance the biodiversity and be useful in training students and staff about the healthy practices and food grown which would be used in Canteen.
- ➔ **Waste vio** – University can tie-up with our organization and students can be encouraged to collect dry waste and electronic waste such as newspapers, old laptops, and others and hand them over on a weekly or monthly basis thereby making a waste reduction approach in the community. This has benefits such as awareness, and eco-friendly habits in becoming a responsible citizen.
- ➔ **Signages** – In addition to the signages being in regular language there can be additional signages in braille language for the specially-abled students.



# On-site investigation and physical verification Audit Team during the visit on Tuesday, 10 January 2023)



Discussion with the Core Team



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

## 9. 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](http://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/heat-islands/what-you-can-do-reduce-heat-islands>
- ➔ <https://www.epa.gov/heat-islands/learn-about-heat-islands>
- ➔ <https://earthbound.report/2021/07/14/5-ways-to-reduce-the-urban-heat-island-effect/>



