

ENVIRONMENT AUDIT

STUDY PERIOD (TWO YEARS) 2019 – 2020 AND 2020-2021

Sustainability study
AUDIT REPORT

Studied for
Swami Shukdevanand College
Mumukshu Ashram, Shahjahanpur (U.P.) 242226

Studied in the capacity of
An accredited & Certified Green Building Professional



Studied by

Greenenvia
Solutions

Valid till May 2023

Disclaimer

The Audit Team has prepared this report for the **Swami Shukdevanand College** located at Mumukshu Ashram, Shahjahanpur (U.P.) 242226 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 has completed audits of multiple Institutes including Technical, State University, Private University and Single Faculty Colleges for a total of more than 60 lakhs+ sq. ft. of Built-up area audited till date Pan India as an Accredited and Certified Green Building Professional-Architect; ISO Certified I.A. (IMS). Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

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

Greenvio Solutions

Developing Healthy and Sustainable Environments

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

Palghar District, Maharashtra- 401208

sustainableacademe@gmail.com

Acknowledgement

The Audit Assessment Team thanks the **Swami Shukdevanand College, Shahjahanpur, Uttar Pradesh** 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 **Swami Chinmayanand Saraswati**, President; **Shri. Ramchandra Singhal**, Vice President; **Dr. A. K. Mishra**, Secretary; **Dr. A. Massey**, Joint Secretary and everyone from the Management.

Our heartfelt thanks to Chairperson of the entire process **Dr. Anurag Agarwal**, Principal for the valuable inputs.

We are also thankful to **College's Task force the faculty members** who have collected data required **Dr. Shaleen Kumar Singh**, Head, Dept. of English (*Special mention for the excellent coordination*); **Dr. Madhukar Shyam Shukla**, Head, Dept. of Economics (In-Charge, Green Audit Committee); **Dr. Deepak Singh**, Asst. Prof., Dept. of History (Co-incharge, Green Audit Committee); **Dr. K.K. Mishra**, Asst. Prof., Dept. of Teacher Education (Member, Green Audit Committee); **Shri. Mridul Patel**, Asst. Prof., Dept. of Sociology (Member, Green Audit Committee); **Dr. Manoj Kumar Mishra**, Head, Dept. of Education (Member, Green Audit Committee); **Dr. Mumutaz Husain**, Asst. Prof., Dept. of Botany (Member, Green Audit Committee); **Dr. Santosh Pratap Singh**, Asst. Prof., Dept. of Commerce (Member, Green Audit Committee); **Ms. Brij Lally**, Asst. Prof., Dept. of Commerce (Member, Green Audit Committee); **Ms. Aparna Tripathi**, Asst. Prof., Dept. of Commerce (Member, Green Audit Committee); **Dr. Prajjawal Pundir**, Asst. Prof., Dept. of Drawing & Painting (Member, Green Audit Committee); **Mr. Akhilesh Tiwari**, Asst. Prof., Dept. of Teacher Education (Member, Green Audit Committee); **Mr. Abhishek Kumar Bajpai**, Asst. Prof., Dept. of Teacher Education (Member, Green Audit Committee) and **Ms. Kumud**, Asst. Pro., Dept. of English (Member, Green Audit Committee).

We highly appreciate the assistance of the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

Disclaimer	1
Acknowledgement	2
Contents.....	3
1. Introduction.....	4
2. Institution overview	7
3. Green Building Study Audit.....	9
4. Site Study.....	10
5. Ecological (Environmental) Audit	11
6. Towards a Healthy & Sustainable Institution.....	19
7. References	21

DETAILED REPORT

1. Introduction

1.1 About the Institution

Swami Shukdevanand College, started with BA first year classes, and within a short span of time it touched the great heights of development, the B. Ed classes were started in 1965 in the college.

The same year B. Sc. classes were also added to the institution. With the glorious talent show in the field of Arts, Science and Education, the institute continued its journey for years. The efforts of the new management committee bore fruits with the addition of B. Com courses in 1985. The college got the permission from the government to run M. Ed. and M. Com courses.

A complete new look was given to the library and reading room in 2003, when it was constructed with all the facilities. Various lecture halls, lecture theatres, and indoor stadium were built in the year 2004 and were inaugurated on February 26, 2006, by the ex-president of NCERT, Dr. J.S. Rajpoot, and the then director of higher education, Dr RK Baslas.

Administrative building of the college was renovated in 2004-2005. The college got the approval for botany and zoology subjects from the university and started its classes from 2006-2007. Staff room for arts and commerce faculties, 14 lecture halls on the second floor and other important halls were constructed in 2007-2008.

PGDCA and BCA classes were started from July 2008. BP Ed classes are also under proposal. New laboratories for Chemistry, Zoology and Botany have been constructed and other lecture halls are under construction.

Beautification work for the college remains constantly under progress. In the year 2009, BBA Program was commenced. Besides, B.Com (Finance) and B.Com. (Hons.) programs were also started in the year 2013. After two years in 2015, seven postgraduate courses in Arts streams and Five Postgraduate courses in Science stream were launched. And recently in the year 2016, one more self-financed unite of B.Ed. was started in the college.

The college takes pride in proclaiming that each year; many students of the college take Chancellor's medal.

1.2 Statements of the Institution

1.2.1 Vision

The College has envisioned “Being a dynamic organisation contributing to a transformed, equitable and quality higher education and training system in India.”

1.2.2 Mission

The College adheres and focuses to the following mission:

- ⇒ To Ensure and sustain high quality value based Education
- ⇒ To inculcate values of lifelong learning develop their unique and innovative ideas.
- ⇒ To mould the youth into a self-reliant and responsible citizen.

1.3 The surrounding premises around the Institution

The Premises is situated amidst the landscape serene of **Shahjahanpur district of Uttar Pradesh** with immense peace and calmness in the surroundings. There is a frontal approach which provides quite a beautiful appreciation space while approaching the premises; this area is surrounded by huge trees which positively complement the background-foreground aspect in terms of Natural space and built-form Architecture. It also provides ample shade which enhances the micro climate of the region. The location of College is feasible to the nearby essential amenities such as Public Health Center, Fire Station, Civic body-Public administrative buildings, Recreational gardens and Police Station which are not too close but nearby.

1.4 Assessment of the College

1.4.1 Affiliations

The College has all its courses approved and affiliated to **the Mahatma Jyotiba Phule Rohilkhand University**, a government university in Uttar Pradesh, India and the premises is spread over 206 acres.

1.4.2 Certification

- ⇒ **AISHE** – The College has the AISHE Code C-13367-2020.

- **ISO** – The University is 9001:2015 Certified for Quality Management System from SP Certification Limited in March 2022.

1.4.3 Recognition

The College is recognised by **University Grant Commission (UGC)** under section 2 (f) and 12 (b) of the UGC Act, 1956 vide by University Grants Commission, New Delhi.

1.4.4 Accreditation

The College received 2.53 CGPA with a 'B+' Grade in its First cycle of NAAC in October 2006. The College is due for its second cycle of NAAC soon.

1.5 Achievements of the Institute

The College has a tremendous track record of excellence for the educational services provided; it received the **"Swachhta Action Plan Award for 2021-22"**

2. Institution overview

2.1 Populace analysis for Academic year 2020-2021

2.1.1 Students data

The student data (shared by the College) shows there were a total of **3,654 Boys and 2,226 Girl students**, thus there were **a total of 5,880 students** on the premises.

2.1.2 Staff data

Type	Male	Female	Total
Admin staff	13	1	14
Teaching staff	51	24	75
Non-Teaching staff	33	9	42
Total Staff Members	97	34	131

Table 1: Staff data of the Institution for 2020-2021

The staff data shows the premises had a total of **131** Staff Members.

2.2 Populace analysis for Academic year 2019-2020

2.2.1 Students data

The student data (shared by the College) shows there were a total of **3,117 Boys and 2,074 Girl students**, thus there were **a total of 5,191 students** on the premises.

2.2.2 Staff data

Type	Male	Female	Total
Admin staff	14	1	15
Teaching staff	51	24	75
Non-Teaching staff	33	9	42
Total Staff Members	98	34	132

Table 2: Staff data of the Institution for 2019-2020

The staff data shows the premises had a total of **132** Staff Members.

2.3 Total College Area & College Building Spread Area

The **total site area is 6.17 Acres** and the **total Built-up area of College is 1,87,260 sq. ft.** for a **total of 6,011 footfalls.**

2.4 College Infrastructure

2.4.1 Establishment

The College was established in 1964. The college is located pretty close to nature and hence has very fresh environment which is absolutely pollution free and healthy. The Building is a Reinforced Cement Concrete (RCC) framework building. **Overall the Infrastructure of the Building is excellent in terms of the Architecture Design and Green Building Design. The Premises covers quite a few of the requirements for a Green Habitat.**

2.4.2 Spatial Organisation

The overall ambience of the College is warm and inviting. The classrooms and other spaces have ample natural ventilation in the form of clear glass windows with fresh air ventilation. The architecture of the building is quite well designed. The colour palette not just helps the building to stand out but also provides an Institutional arena. It balances with the local architecture with the natural landscapes of huge trees all around. The design emphasis on providing calmness to the built form and gradually merges with the serene landscape. The floor to floor height is more than 11 feet. There is no provision for lifts in the premises, whereas there are amenities such as CCTV, Fire extinguishers, Library and first aid box.

2.4.3 Operation and maintenance of the premises

The interview session with the staff regarding the operation and working hours is summarized in the table. The Institution is open from Monday to Saturday. The detail wise timing for each is mentioned below.

S. No.	Section	Days	Time	Hours/ day	Days in a year
1	Teaching	Monday to Saturday	09.00 am to 03.00 pm	6	280
2	Non-teaching	Monday to Saturday	10:00 am to 05:00 pm	7	280

Table 3: Schedule of the timings of the premises

3. Green Building Study Audit

3.1 About the Green Building Study Audit

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

3.2 Analysis for 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 premises; Scope to include Rain water harvesting and Waste water treatment in 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 campus
- Analysis of the flora and fauna of campus
- 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 admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collected and preparation of the Report.

3.4 Timeline of the activities for Green Building Study Audit

- 11 April 2022 – Allotment and Initiation by the College
- 12 April 2022 – Induction meeting
- 05 May 2022 – Survey of the Student and staff submitted
- 12 May 2022 - Site visit at the Institute
- 12 May 2022 – Submission of the report

On-site investigation and physical verification
Audit Team during the visit on 12 May 2022



Discussion session with the Management, Principal and College Faculties



On-site review with the Team

4. Site Study

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

- **Location** - The Swami Shukdevanand College located at Mumukshu Ashram, Shahjahanpur (U.P.) 242226 and falls under the Nagar Nigam Shahjahanpur.
- **Neighbourhood context** - The premises is surrounding by open spaces and Residential, Commercial and Educational areas on the immediate surroundings of the site.
- **Natural physical features** – The premises includes a rich biodiversity and huge number of plants in the adjacent open space. The site does not have major difference in the land levels (contours).
- **Manmade features** – The premises is situated in a semi-urban area amidst residential areas and open spaces with appropriate proximity to necessary amenities. There is sufficient appreciation space for entrance. The materials used for construction are RCC and the landscaping includes innumerable natural trees as well as potted plants.
- **Circulation** – There is a smooth transition of pedestrian traffic inside the premises due to the large entrance gate and the huge open space where vehicles of students and staff are parked.
- **Climate** – The climate in Shahjahanpur is warm and temperate. In winter, there is much less rainfall than in summer. The climate here is classified as Cwa by the Köppen-Geiger system. The average annual temperature in Shahjahanpur is 24.5 °C | 76.1 °F. The rainfall here is around 1058 mm | 41.7 inch per year.

(Source: <https://en.climate-data.org/asia/india/uttar-pradesh/shahjahanpur-4950/>)

Ecological (Environment) Audit



Background reference image Yugal Shrivastava on pexels

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.

The College has huge open space used by all. The students use it as a leisure place for study and College ground is used for sports activities. There are ample resting spaces as part of building design which provide a resting and warm welcoming approach in the premises.

5.1 Open Spaces

There is a beautiful balance of natural and open spaces in the premises and the open/vegetation spaces are balanced overall. The ground is used by students at present for sports and cultural gatherings. The design on the entire is such that the landscape and softscape spaces are very well oriented and located thus being extremely useful to Institutions in the site. **There are provisions for natural plantations which have enhanced the beauty of the space.**

There are adequate numbers of Maintenance staff allotted for the upgrading the open spaces and they have done an excellence job in terms of the duty allotted. The infrastructure committee too is involved in this process. The traditional tap and pipe facility is adopted for watering and the College has taken special provisions for the same. The spaces are watered daily in summer. **The efforts to maintain the existing space are commendable.**

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 every year. The landscape area has a variety of plantations constituting hundreds of surveyed trees in premises in the last few years as follows with detail description of each.

S. No.	Plant name	Type	Nos.
1	<i>Ficus religiosa</i>	Peeple tree	5
2	<i>Polyalthia longifolia</i>	False ashoka	33
3	<i>Cycas revoluta</i>	Sago palm	35
4	<i>Roystonea regia</i>	Royal bottle palm	60
5	<i>Yucca gloriosa</i>	Spanish dagger	10
6	<i>Araucaria araucana</i>	Monkey puzzle tree	20
7	<i>Schefflera arbaricola</i>	Dwarf umbrella tree	25
8	<i>Tabernaemontana divaricata</i>	Pinwheel flower	20
9	<i>Yucca gigantea</i>	Spineless flower	10
10	<i>Epipremnum aureum</i>	Silver vine	20
11	<i>Ficus benjamina</i>	Weeping fig	40
12	<i>Dracaena reflexa</i>	Song of india	20
13	<i>Plumeria alba</i>	White frangipani	20
14	<i>Washingtonia robusta</i>	Maxican fan palm	4
15	<i>Tectona grandis</i>	Teak tree	97
16	<i>Artocarpus heterophyllus</i>	Jack fruit	1
17	<i>Ipomoea batatas</i>	Sweet potato	Many
18	<i>Thymus vulgaris</i>	Garden thyme	Many
19	<i>Schinus molle</i>	False pepper tree	Many
20	<i>Psidiu guajava</i>	Guava	5
21	<i>Plumeria rubra</i>	Red jasmine	10
22	<i>Euphorbia milli</i>	Crown of thorns	50
23	<i>Ocimum tenuiflorum</i>	Tulsi	100
24	<i>Mangifera indica</i>	Mango	8
25	<i>Robinia pseudoacacia</i>	Black locust	Many
26	<i>Cassia fistula</i>	Golden shower	5
27	<i>Delonix regia</i>	Flame tree	5

28	<i>Callistemon citrinus</i>	Bottle brush	4
29	<i>Cascabela thevetia</i>	Kaner	6
30	<i>Bougainville spectabilis</i>	Paper flower	Many
31	<i>Ficus elastic</i>	Rubber plant	50
32	<i>Bixa orellana</i>	Sindur plant	Many
33	<i>Phoenix dactylifera</i>	Date palm	4
34	<i>Eucalyptus globules</i>	Tasmanian blue gun	10
35	<i>Coffea arabica</i>	Arabian coffee	Many
36	<i>Impatiens balsamina</i>	Balsam	Many
37	<i>Cardyline fruitcosa</i>	Cabbage palm	Many
38	<i>Tecoma stans</i>	Yellow trumpet bush	Many
39	<i>Ligustrum lucidum</i>	European privet	Many
40	<i>Dracaena draco</i>	Dragon tree	10
41	<i>Azadirachta indica</i>	Neem tree	5
42	<i>Caesalpinia gilliesii</i>	Red bird of paradise	7
43	<i>Monstera deliciosa</i>	Swiss cheese plant	Many
44	<i>Dalbergia sissoo</i>	Shisham	1

Table 4: Details of the Flora in the premises

At present there are 700+ plantations comprising of plants, trees, shrubs. All of these are planted on various occasions while some have grown naturally. Timely maintenance with sufficient care has resulted in positive benefits for the surroundings.

5.2.2 Fauna Audit

It is a beautiful site to have the birds chirping around the College premises. It highlights the ecological co-existence concept in the most beautiful way.

5.3 Noise Audit

5.3.1 Macro level

On a macro level there are open grounds in the site. The approach road too has very minimal traffic. As the College is oriented amidst the residential areas with immense vegetation the noise levels do not affect the students and staff in their day to day functioning. The approach road too is pretty away. **Overall the noise level in terms of bad effect is extremely low and there are positive outcomes as per our analysis on macro level.**

5.3.2 Micro level

The College has an adequate open space covered with huge trees prevailing naturally in the premises which act as a noise barrier; in addition the Institution building is surrounded by Residential Buildings which further act as a benefit in reducing any noise pollution. There are parking provisions provided in the premises which causes minimum noise as they are situated near the entrance which is a bit away from the College building.

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:

- **Ease of commuting** – Owing to close proximity to public transport the access is very feasible and walk able.
- **Parent's commute** - There are 2 Parent-teacher meetings held in a year and the turn-out is around 40-60%
- **Vehicles details** – The provision provided by College includes vehicle parking is allowed at present as follows.

S. No.	Type	Nos.	For (student/ Staff)
1.	Cars	15-20	Staff
2	Bikes	25-30	Staff and Students
3	Cycles	40-50	Students
4	Electric vehicles	0	Staff and Students

Table 5: Details of the Parking in the premises

5.4.2 Heat Island Reduction

The Institution has **adopted the following practices which are yielding positive results** in terms of Urban Heat Island Effect which refers to increase in temperature of the surrounding because of ineffective strategies.

- **Exposed roof areas** – The top floor has a sloping roof which is absolutely clean and well maintained. The Buildings are covered with white paint and the Maintenance staffs along with Management have taken ample measures to

maintain the same. **There was no weathering of roof observed.** The current practices are well maintained.

- **Exposed non-roof hardscape areas** - There are pathway on all sides of the premises. These include some natural and potted plantations along the pathways. Huge garden spaces are available in the premises.

There are adequate measures adopted in the premises to reduce heat island effect of Building roofs and in site.

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 that makes it 15% of total population of India. **There are Ramps, Handrails along staircase and low height risers in the Staircases as part of universal campus initiatives.** The design of the premises is appropriate for access with passages and corridors being wide enough in size and naturally ventilated. The doubly and singly loaded corridors are safe from fire safety aspect. The College has resting places (seating areas) in the outdoor along the trees thereby making it user friendly for the especially abled students.

5.6 Fire Safety

The Institution has undertaken adequate fire safety measures. Each floor has an open staircase without any barriers for fire safety measures. These staircases are free of any kind of storage or combustible material. The windows in each classroom are at a low height with fresh air and natural light thereby adding to ample ventilation throughout the day. **The College should adopt additional fire safety practices such as fire hydrant, sprinkler, and fire alarm in future.**

5.7 Survey Results

An online survey was conducted to analyse the views about the premises, following are some of the reviews.

5.7.1 Participation

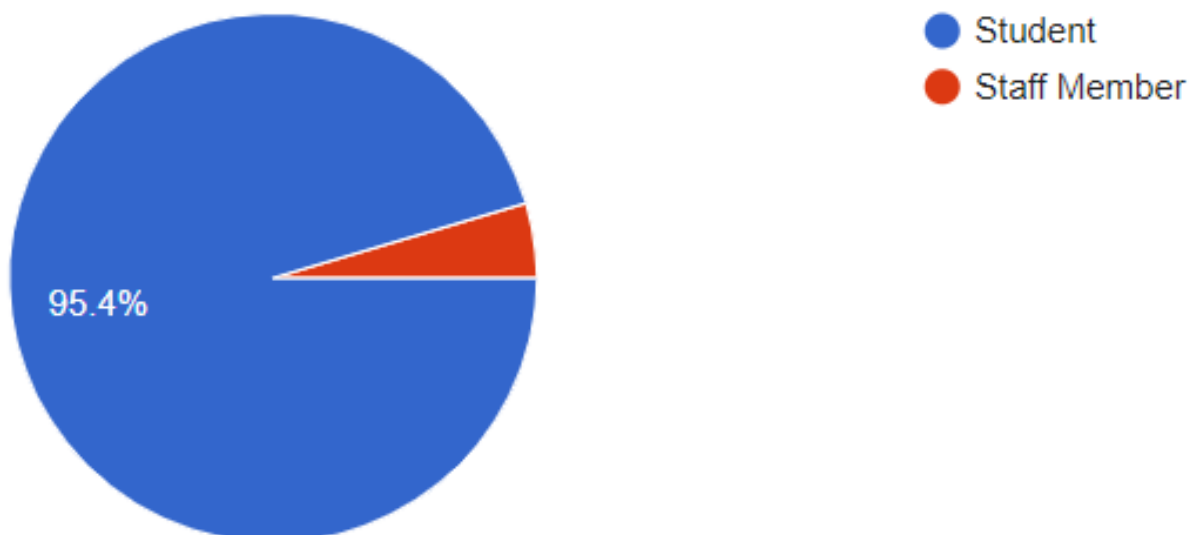


Figure 1: Participation analysis in the survey

A total of **1,094 responses** were received out of which 95% were students.

5.7.2 What according to you are the positive steps taken by the College towards Green Building/ Good maintenance?

We have listed some of the key responses below.

- Clean every area
- Because our all Teachers are very reasonable for the nature and our environment of the word so my collages grounding is green by the plants green trees and other flowers plant.
- Good faculty of maintaining of collage building's and better settlement of dustbins and other cleaning activities.
- Encouraging students toward planting trees saving water conducting speeches on such topics and giving prizes to keep our moral up towards these practices
- No mobile zone.

5.8 Positive site features as per our study

a) Avoid using plastic in premises

There are provisions for ban on the use of plastic bags or products in the Premises.

b) OPAC system

The system in the library is beneficial for the students.

c) User friendly movability in premises

There are provisions for Kerb Ramp near the main entrance of the Building premises, also low height hand rail for ease of access.

5.9 Recommendations for a Sustainable Habitat by Greenvio Solutions

Site beautification

a) Additional facilities for birds

There can be provision for drinking water and food facility for birds visiting the College premise.

Heat island reduction

a) Cool rooftops

It is suggested that the College gets the Terrace roofs painted with Cooltop as it will help reduce the temperature of the spaces.

Pollution Control

a) Promote the use of Eco-friendly vehicles

There can be provision for battery-operated vehicles/ low emission vehicles such as electrically driven vehicles parking in open spaces along with battery charge points, this would inspire students to change their mode of transportation and adopt sustainable practices.

b) Bicycles as a gift

As an appreciation gesture maybe the student's toppers/ staff best performers can be awarded a bicycle occasionally.

c) Paperless technologies for offices

The college can go technology-friendly and go paperless in the functioning of the Premise to a certain extent maybe not fully.

d) Plant more carbon dioxide absorbing plants

Specific plantations such as follow 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 CO₂ 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 CO₂ 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\(CAM\)\)](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>)

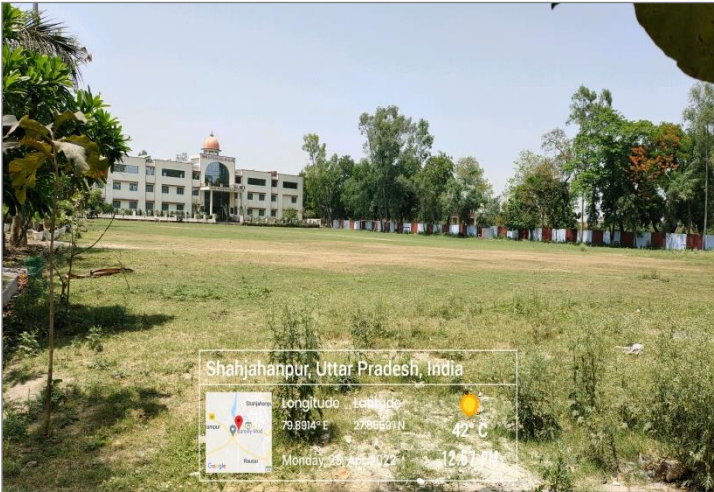
Responsible environment systems

Community gardening.

There can be provisions for community gardening in addition to allowing the general public to use the parks on the premises for walks and jogging.

On-site investigation and physical verification

The ecologically friendly ambience with facilities such as open spaces, lifts and gardens



Plantations and playground in the premises



Lush green premises

6. Towards a Healthy & Sustainable Institution

6.1 Inputs by Greenvio Solutions

Based on the analysis of the study of premises in addition to the recommendations provided in each section of Ecological, Water, Waste, and Energy Audit the University can adopt the following strategies for a Healthy and Sustainable Institution practices.

- a) **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.
- b) **Environment Certificate Courses** – The College could begin courses such as Bachelor's, Diploma, or Certificate courses with National and International Collaboration related to Environment as part of the courses provided. Though, this is not a requirement or compulsion.
- c) **Terrace farming** - 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. It helps in smaller steps are taken have huge impacts when each student would adopt these practices in their homes or societies and grow kitchen garden, and terrace garden there will be a long term benefit for the environment as a whole.
- d) **Signages** – In addition to the signages being in regular language there can be additional signages in braille language for the specially-abled students.

6.2 Survey Results

An online survey was conducted to analyse the student and staff views about what changes according to you can be undertaken for Green audit improvement in College premise and activity. **Some of the suggestions are listed below:**

- Awareness program for stopping the single use plastic and stopping the misuse of water and energy among students and society should be run regularly.
- According to me, the best improvement is to try to preserve the greenery that is available.
- Plant more carbon dioxide absorbing plants like Pine, Neem, Peepal, Bamboo, Banyan which will help in Carbon Neutralising.
- Ozone conservation and more activities
- Shady tree cover should be increased and flowering plants should be used at appropriate places.
- A special team for sustainable development.
- There can be join the student to other government green programme.

However, it should be noted that the College has taken up multiple initiatives and because of Pandemic the students have not practically visited the premises so many of these points are not mandatory at the moment.

7. References

1. Uniform Plumbing Code – India, 2008
2. IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
3. IGBC Green Landscape Rating system, March 2013
4. BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
5. Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.
6. Climate data <https://en.climate-data.org/asia/india/uttar-pradesh/shahjahanpur-4950/>

