Green Audit

Study Period (Two Years) 2022–2023 & 2023 - 2024

Sustainability study

AUDIT REPORT

Studied for

Nagpur Institute of Technology

Survey no.13/2,Katol Road,

Near Fetri,mahurzari,

Nagpur,Mahrashtra-441501, India

Studied in the capacity of

Accredited and Certified GBP

Studied by

Greenvia
Solutions

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Background reference image Sasin Tipchai on unsplash

Disclaimer

The Audit Team has prepared this report for the **Nagpur Institute of Technology** located Survey no.13/2, Katol Road, Near Fetri, Mahurzari, Nagpur, Mahrashtra-441501, India based on input data submitted by the Institute analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

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The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

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

Ar. Nahida Abdulla
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Acknowledgement

The Audit Assessment Team extends its appreciation to the **Nagpur Institute Of 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 extended are due to everyone from the Management.

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

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

- ➲ Teaching staff member – *Mr. Amit M Kharwade* (Assistant Professor) and *Mr. R.D Khorgade* (Assistant Professor)

- ➲ Non-teaching staff member – *Mr.N.Khode* and *Mr.Kiran Sawarkar*

- ➲ Admin staff member – *Mr. Sandip Kale,* (Registrar) and *Mr.R.Khobe* (Assistant Registrar)

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

1.   Introduction

1.1   About statements of the Institute

1.1.1 Vision

The Institute proposes "Service to Society by creating Technical & Skilled manpower through Value based Technical Education."

1.1.2 Mission

The Institute adheres and focuses:

- ⤷ To provide quality technical education to meet the requirements of industries and society
- ⤷ To equip students with need based technical skills through continual improvements in Teaching Learning processes and research activities
- ⤷ To inculcate ethical values for overall holistic development of students

1.2   Assessment of the Institute

1.2.1 Affiliations

The courses provided by the College have received their affiliation through **RTMNU ,Nagpur**

1.2.2 Certification

The College has received the following Certifications

- ⤷ **AISHE** – The All India Survey of Higher Education code is C-18725
- ⤷ **ISO** – Certification for 9001:2015 Quality Management System

1.2.3 Approval

The courses provided by the College are approved by:

- ⤷ **All India Council for Technical Education (AICTE), New Delhi**
- ⤷ **Directorate of Technical Education (DTE), Maharashtra**

2. Overview about college

Nagpur Institute of Technology is a brand name in Central India for conveying Quality Education that gathers International Standards. It is one of the rapid budding technological institutes of elevated status in the region and is one of the **Top Engineering Colleges in Nagpur.** This institute is very well known for its farsighted management, full-fledged and marked guidance, superior enthusiastic faculty, state of art infrastructure, towering academic principles, stringent academic restraint, outstanding co-curricular and extracurricular bustles and much endowed scholars. The college places exceptional and unique prominence interrelated to the expansion of the students such as all round persona progress, option of international revelation at UG echelon, temperament and proficiency edifice, industrial training and industrial projects. Nagpur Institute of Technology was established in 2008 and is a self-financed institution affiliated to RTM Nagpur University and approved by All Indian Council for Technical Education (AICTE), New Delhi and Government of Maharashtra and Directorate of Technical Education (DTE), Mumbai.

3. Research

3.1 Campus area

The **site spread over 10 acres of land covering 1,43,946 sq. ft. of built-up area.**

3.2 About the Green Building Study Audit

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

3.3 Analysis of the Green Building Study Audit

The procedure included detailed verification as follows:

- ⊃ Investigation

- ⊃ Technical

- ⊃ Observations

- ⊃ Inferences

3.4 Strategy adopted for Green Building Study Audit

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

4. Investigation

Plate 1: Rain water harvesting tanks in the premises

Observation: Given the scale of the campus, the project can be improvised.

Plate 2: Pond area in the premises

Observation: The site development should be undertaken w.r.t. facilities and amenities.

5. Documentation

5.1 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.

5.1.1 Green practices

We observed the following points during the investigation data verification of the premises.

- ⮑ **Social awareness** - The Institute has taken up awareness drives on various social issues for rural upliftment and regeneration in the Institute and surrounding villages.

- ⮑ **Silent and peaceful atmosphere –** The Institute is located amidst residential areas which are well designed thus these help to maintain the pollution under control and provide a healthy ambience.

5.1.2 Community development

The details of **_extension initiatives_** under various heads in Institute are documented below:

S. No.	Type	Since	Coordinator name
1	National Service Scheme (NSS)	2008	Prof.R.Kadam
2	National Cadet Corps (NCC)	2018	Prof. M. Kanojiya
3	Employability Skills centre	2022 (MKCL)	Prof.A.U.Gahankari

Table 3: Details of the extension initiatives by the Institute

The details of the **_environmental activities_** conducted as part of the extension initiatives by the Institute documented below:

S. No.	Initiative	Details	Type	Date
Academic year 1 (2022-2023)				
1	World Environmental Day	For raising awareness on environmental issues as marine pollution, overpopulation, global warming, sustainable development	Physical	06-05-2022

		and wildlife crime		
		Increase public awareness of environmental challenges and encourage action		
		celebrated by conducting awareness rally for saving trees		
Academic year 2 (2023-2024)				
1	World Water Day	Raises awareness of the 2.2 billion people living without access to safe water	Physical	22-03-2024
		To raising the awareness among the people regarding importance of water, there usage, avoid wastage of water		
		They celebrated by taking oath on world water day.		

Table 4: Details of the environmental initiatives undertaken by Institute

Plate 3: Certain evidences of the environmental activities

5.2   Waste Audit

Waste is an inevitable part of our lives. Over the years the awareness about waste management techniques has given a rise to rethink how the waste can be avoided 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, and waste management strategies that are implemented in addition to the newer ways that can be adopted aiming to make the premise clean and sustainable.

5.2.1   Waste management (Parameters adopted)

S. No.	Type	Current practice	Proposed practice
1	Solid waste (Toilets)	Building solid waste pipeline is not connected to any biogas plant	*Biogas plant can be proposed*
2	Organic waste (Regular)	Dustbins are placed in the class rooms, laboratories, in front of cafeteria and in the corridors The waste is collected in hand carts and transported to the disposal sites	*An organic compost pit can be developed and utilised*
3	Liquid waste (Toilets, wash basins)	The waste water from the various departments is collected by a network of underground and open drains and disposed into a nallah adjacent to premises. The liquid wastes are mainly drained to improve the ground level of water. Waste water from water closets is collected into septic tanks provided separately for various buildings	*Waste water treatment plant can be set up as there is space and resources availability*

4	E-waste	Some of the e -waste generated is used for technical education purpose by making use of hardware in laboratories for display and study. Some of the components are being used for demonstration purposes. electronic goods are put to optimum use. The electronic components such as old invalid projects of final year students as well as damaged or old electronic circuits, models are reused for making the new electronic devices/projects by the students. department allows the students to reuse those components. Damaged computers are sold to scrap vendor. UPS Batteries are exchanged with the suppliers. Obsolete computers are buy-backed with new ones. Computer machines purchased before five years are sold to the different vendors.	*Tie-up with eco-reco; thereco for recycling*
5	Plastic waste	Segregated and sent to municipal corporation	*Tie-up with Bisleri's Bottles for change, undertake eco-walls project and other practices*

*Table 5: Details of the waste management practices*

5.2.2   Waste management (Measures adopted)

The details of the dustbins available in the premises is documented below:

Dustbin nos.	Floor or Block	Dustbin type	Type of waste disposed
9	Block-C Ground floor	Small	Paper
1	Block-C first floor	Small	Paper
8	Block-B ground floor	Small-6, Large-2	Papers
3	Block-B first floor	Small	Papers
1	Block-B second floor	Small	Papers
0	Block-B third floor	Na	NA
10	Block-A admin block -1 Ground floor	Small	Papers
11	Block-A admin block -2 Ground Floor	Small-09 Large-1	Papers
9	Block-A block First Floor	6 -Small 03-Large	Papers
11	Block-A block second Floor	10-Small, 1-Big	Papers
4	Block-A block third Floor	Small-3, 1-Big	Papers
10	Block-E block Ground Floor	Small-08, Large-02	Papers
1	Block-D block Ground Floor	Small	Papers

Table 6: Documentation of the dustbins in the premises

There are seventy-eight dustbins indoors and six in the outdoor areas of the premises.
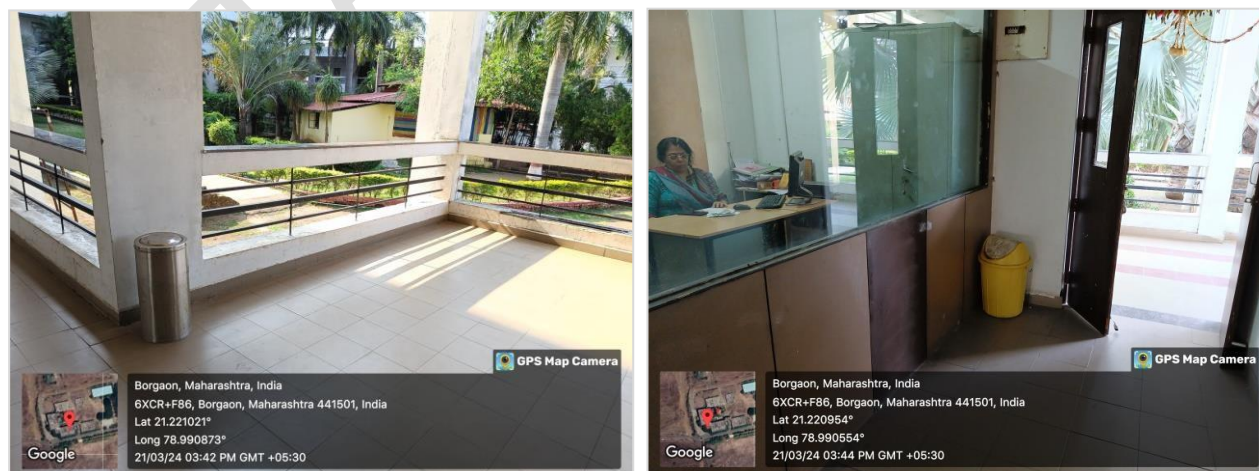
Plate 4: Dustbins in the premises

5.3   Water Audit

Water is one of the basic needs. Pure drinking water is a resource that needs to be preserved efficiently. A water audit helps to identify the sources of water consumption, and the water requirement by the premises is met by these sources.

The effective usage of water without any wastage should be a mandatory practice. Understanding the techniques as per site context to increase water conservation in terms of awareness and practice can be identified and executed as part of this exercise.

5.3.1   Water availability and consumption

5.3.1.1   Source of Primary water supply

The Institute requires water from the Local Municipality for drinking water purposes. **The documentation below related to water tanks in the premises.**

S. No.	Type	Capacity (litres)	Nos.
1	Overhead	5,000 lit, 2,000 lit & 1,000	7, 2 & 1
2	Rain water harvesting tank	1,000 lit	2
3	R.O. Plant	5,000 lit	1

Table 7: Water tanks in the premises

The study suggests that the space requires of tanks can be documented with mention of size, capacity usage, Institute name, colour coding and last maintenance date mentioned on each facility.

5.3.1.2   Source of Secondary water supply

The Institute uses water supply for secondary usages such as watering plants, kitchen, toilets, and wash basins and other spaces. **There is one well that is 22 x 60 feet.**

5.3.1.3   Source of Tertiary water supply

The tertiary source of water is **the source of water harvesting. There are two tanks with a capacity of 1,000 litres;** *since the locality of Nagpur enjoys excessive rainfall we would suggest connecting the rooftop pipes and overflow of tank with the well for ground water recharging.*

5.3.1.4   Source of Reusing waste water

This initiative is not practiced.

The study suggests that keeping the site context and constraints in mind the waste water treatment plant can be explored.

5.3.2 Areas of water usage

Based on the inventory done and data shared by the staff we found that the premise has the facilities such as:

- ⮑ General toilets for male, female
- ⮑ Taps for gardens and toilet facilities
- ⮑ Drinking water cooler
- ⮑ Net-metering for water supply

The study suggests that daily documentation of water supply should be undertaken.

Plate 5: The water cooler in the premises

The study suggests that the hygiene of the area should be improved.

5.4   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.

Plate 6: Sanitary vending machine in the premises

Overall, the premise is good; however the landscape elements can be improved.

6. Inferences

The suggestion (inference) would act as a „PLAN OF ACTION" to implement all the suggestions in a detailed manner. The same has been identified in two phases for a total duration of three years.

- **Phase 1**

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

Section 1 – Green practices audit

- **Environmental awareness**

  - There can be various slogans in local and national language 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.

- **Government initiatives**

  - Undertake initiatives such as Swachh Bharat Abhiyan, cleanliness drives in the Institute and surrounding villages also activities such as the capacity building of locals in surrounding villages by Institute students.

- **Increase the green awareness practice**

  - This should be in terms of the physical and virtual events, which will be beneficial for all stakeholders in the shared premises.   (Basically the frequency of the lectures should be increased)

Section 2 - Waste audit

⮑ **Awareness**

- o Educate the housekeeping staff through monthly or quarterly programs related to waste management

- o Generate awareness among student and staff stakeholders about products that generate waste through display boards about „Do not litter" with messages about waste management, its importance and process

⮑ **Measures towards waste management**

- o Check cutlery practice in canteen area to inculcate healthy habits

  i. Steel/ paper/ bagasses (sugarcane waste) plates for food

  ii. Paper cups/ Kulhad or mud containers for tea

  iii. Spoons or straws made of disposable or edible material

  iv. Stakeholders can be guided to bring their own tiffin"s for material management

  v. Possibilities of waste paper reused including newspaper for cutlery replacement can be explored

- o Waste management for every type of waste

  i. Increase the manpower for campus management

  ii. Avoid any kind of waste burning as it is hazardous

  iii. Green organic waste – Dust, dry leaves, twigs, branches – Converted into organic compost/ bio fertilizer

  iv. Brown organic waste – Non-vegetarian food waste along with green organic waste converted into vermin compost

  v. Scrap materials – Generated through furniture or old products should be recycled 100% through workshops for stakeholders

  vi. Go paperless – Use online medium to transfer notes and all information which save paper waste

➩ Regular checks

- o <u>Food wastage</u> - Check the quantity of food wastage in canteen/ hostel mess and device a plan of action with the staff accordingly

- o <u>Dustbins overflow</u> – Location of the dustbins, whether they are over flowing, whether the waste is dumped anywhere within or in backyard of premises – Take a check and collect the waste appropriately

➩ Facilities

- o <u>One dry small dustbin</u> of each class must be installed

- o <u>One dry big dustbin</u> has to be installed in every 10-20 meters of walking area in outdoor spaces

- o <u>Install twin litter dustbins</u> on every floor, outdoors specifically canteen - Provision of coloured specific dustbins for different waste, instruction boards at multiple locations „OR" Blue dustbin for degradable or red dustbin for household waste or green dustbin for recyclable

- o <u>Install Sani bins</u> with display of „Sanitary pads icon" in washrooms of every department and toilets

Section 3 - Water audit

➲ **Awareness**

- o Remind every stakeholder about water conservation/ avoid water wastage by displaying board at every wash room, laboratories, outdoor ground and canteen areas

- o Literate employees about water conservation and educate the staff members about the measures and action that can be taken

➲ **Measures towards water conservation**

- o Put a container below the outdoor unit pipe of every air conditioner and reuse the same for secondary purposes such as washing cars, cleaning campus outdoor areas etc. avoid using the same for plantation.
    - i. Maintain a record of the nos. of containers and water recycled on a daily basis, further prepare a monthly or quarterly report about the same

➲ **Regular checks**

- o Check taps/ faucets of toilets, wash basins, laboratories and outdoor areas for non-working conditions and leakages on a daily basis after 5 pm or once Institute"s working hours are over

- o If there is hostel facility there should be a regular check once students go to the Institute for any open taps or any type of water wastage; additionally replace all showers wiht bucket and tap system within hostel premises

- o Lock the outdoor taps when they are not in use and check pipelines for damage to avoid any non-maintenance

- o Use buckets for floor cleaning to save water and recycle the waste water

- o Any kind of water wastage in any area indoor/ outdoor in every department of the Institute and report about the same to authorities

- o Cover any open drain/ open water area (except farm/ water pond) that can be prone to become a mosquito breeding spot

Section 4 - Health and Hygiene Audit

➲ **Awareness**

- o <u>Prepare specific instructions for cleaning and sanitizing</u> and display the instructions all over premises

- o <u>Display signages/ posters about „Do not spit" and „Keep surrounding clean" No smoking" and „Healthy premises"</u> for healthy habits

- o Undertake <u>every Saturday „Campus Cleanliness program"</u> once in a week by the students and staff members

➲ **Neat and clean premises practices**

- o Daily one times cleaning of all floors passage areas through sweeping dusting in indoor areas collection of dry fallen leaves and access ways; watering of plants in outdoor areas

- o Daily three times cleaning, disinfecting washroom areas and check to avoid any garbage burning all around campus

- o Weekly deep cleaning of building spaces including individual areas, open grounds and grass cutting

➲ **Stakeholder intervention**

- o <u>Practice pest control programs</u> with through external stakeholders such that „Once in every 15 days for Library" whereas „Once in a month for outdoor areas such as open drains, mosquito breeding spots etc." and „Once in every six months or annually for entire campus"

➲ **Hygiene Facilities - Availability of Sanitizing Equipment**

- o <u>Water dispenser (Non-mechanic/ electric), hand wash</u> on every floor

- o There should be facilities such as <u>potpourri, camphor tablets</u> in the toilet to avoid smell and health related issues in toilet areas

7. Compilation

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

- 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

- BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada