



Dr. Khatri Mahavidyalaya,
Tukum, Chandrapur, Maharashtra
India

* **GREEN AUDIT**
REPORT *

2023-24

ISO-14001: 2015



Report Prepared By

TLCs Nagpur

TLC's
Tender Loving Cares

ISO 14001:2015



Certificate

(Renewal)

This Certificate has been awarded to

Dr. Khatri Mahavidyalaya

Tukum, Chandrapur, Maharashtra India

Has carried out a thorough **Green Audit** of their campus and provided all relevant information and credentials for security. The actions and measures carried out by the college have been checked based on the report presented and deemed to be **satisfactory**. And also take serious action on maximum recommendations. The efforts made by the staff and students in the field of environment, conservation, and sustainability are much appreciated and commended.

Certificate No. – TLCS/GR-A/R-019

Date of Issue – 10/03/2024

Expiry Date – 09/03/2025

Issued By

A handwritten signature in black ink, appearing to be 'S. K. Khatri'.

Director

TLC's Nagpur



Note: The validity of the certificate is determined by the organization's compliance with environmental audit recommendations, as well as the system's ongoing maintenance and surveillance audit.



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Following the recommendation of the Environmental Auditor, Dr. Khatri Mahavidyalaya has taken a significant step towards sustainability by installing a medicinal garden and compost pits within the college premises in the year 2024. This initiative not only promotes environmental conservation but also provides a valuable resource for students and faculty to learn about medicinal plants and sustainable waste management practices. It reflects the college's commitment to creating a greener and healthier environment for all.



Figure 1. Medicinal plants in college premises



Figure 2. Demonstration on solid waste management in college campus

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College students also completed the Green Audit project to comprehensively understand biomass's role in carbon sequestration and its implications for mitigating climate change. For their college, the results of this project are summarized below.

1.1 Physical and Chemical Analysis of Water Sample

Sr. No.	Parameters	Unit	Ground	IST Floor	IIND Floor	Tap Water
1	pH	----	7.4	7.2	6.6	7.1
2	Temperature	°C	27	27	29	26
3	Electrical conductivity	Us/cm	158	154	146	450
4	Total Hardness	mg/l	50	40	60	560
5	Chloride	mg/l	3.2	2.8	2.0	110
6	Alkalinity	mg/l	10	12	20	140
7	Acidity	mg/l	10	10	10	20
8	Dissolved Oxygen	mg/l	6.0	6.2	6.5	4.8

1.2 Noise Level Measurement

Location	Noise Level (decibel-Db)
First floor	40
Open passage-first floor	42
Ground floor	48
Library	31
Open ground	68
College office	48
Outside entry gate	76

1.3 Soil Quality Parameter and Concentration

Soil Quality Parameter	Concentration
pH	8.1
Chloride mg/l	510
Organic Matter %	1.2

1.4 Airborne Particle Analysis

Location	Insoluble Particles (g/m ²)	Soluble Particles (g/m ²)	Total Particles (g/m ²)
College terrace top	0.46	0.3	0.32

1.5 Biomass Estimation

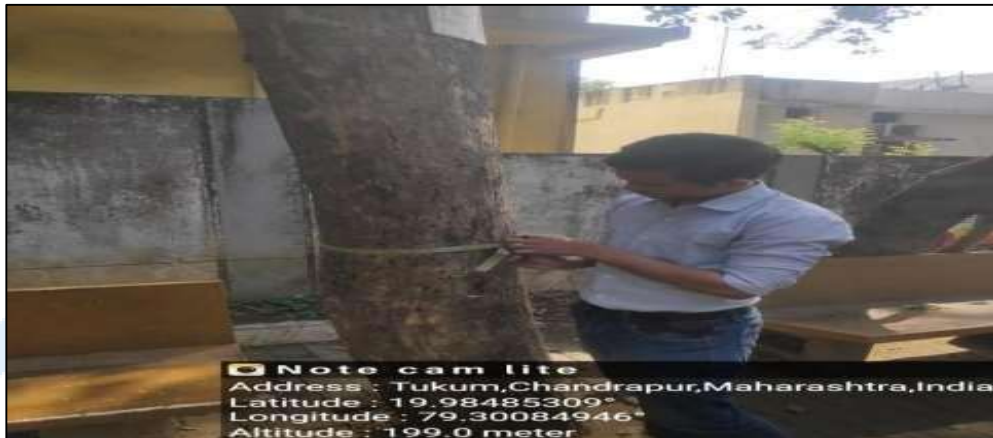


Figure 3. Measurement of tree biomass

Estimated biomass was calculated by,

Total Basal Area = 3.736 m²

Standing Woody Biomass = (Total Basal Area × 8.32) - 1.69 = 29.39 tonnes

Carbon Sequestration = Total Biomass × 0.5 = 14.69 tonnes

1. Introduction

Auditing is an evaluating system of college in terms of internal controls for achieving goals. Planning, on-site work, audit report preparation, and follow-up are the most essential stages of the auditing process. College, in addition to imparting education is committed to environmental protection by reducing environmental impacts such as reducing waste, water and energy consumption. The basic motive is to inspect ongoing processes in college whose exercises can be harmful to the health of students, all workforce and environment. Our intention is to achieve environmental sustainability by implementation of better environmental sound practices.

1.1 Planning of preparation of Green Audit involves comprehensive steps of observation and verification by on-site visit. Planning process started with a discussion among committee members, the objectives were framed, the methodology followed by sampling and final report preparation ended with a number of initiatives to be undertaken for environmental sustainability.

2. Objectives

Objectives are significant to enhance our vision which further converts in the measurement of environmental components for achieving goals. Earth's natural resources are important to support life, but its overexploitation can lead to disturbance of the natural balance. In present time, conventional auditing supported by Green Auditing may assist the college to manage environmental resources by effective environmental mitigation measures. The following objectives are systematic attempt to reach at a target which could guide us for safe and clean environment for all.

1. To observe land use for various purposes.
2. To record and document tree species and faunal diversity in the college premises.
3. To prepare an air quality observation report.
4. To analyse water samples for aesthetic parameters.
5. To record noise level in the college premises and outside area.
6. To study soil quality of the college campus.
8. To prepare report on E-waste disposal and management.
9. To study solid waste management practices in college campus.
10. To study electrical power consumption in college.

Environment Policy

Dr. Khatri Mahavidyalaya, Chandrapur has made it a policy to include environmental conservation in decision-making at all levels by stakeholders and to ensure that everyone is aware of the importance of environmental and natural resource conservation. Dr. Khatri Mahavidyalaya, Chandrapur encourages a forestation, landscape and ecosystem restoration, soil and water conservation, water quality maintenance, waste management, sustainable energy resources, biodiversity, and climate change mitigation programs and initiatives.



Mission of Environment Policy

Dr. Khatri Mahavidyalaya, Chandrapur policy is to protect the environment, create sustainable solutions, start-ups, encourage rural technology, and reduce energy usage in order:

- To raise student understanding of the need of natural resource protection and the creation of sustainable environments for national success.
- To encourage the development of technology in rural areas in order to achieve more inclusive growth.
- Adopting a fair, ethical, and ecologically conscious strategy that encompasses everything from implementation to student instruction via institutions.
- To assist in the development of a society that is conversion orientated and lives in peace with environment.



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Google Earth Image



Longitude - 19°59'07"N79°18'03"E-197m

Latitude - 79°18'03"E



Figure 4- A green view of college campus

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Land use observation

The total area of Arts, Commerce & science, College is 10100 sq. meters out of which the built-up area is 1908.397 sq. meters and open space & plantation area is 4691.6 and 563 sq. meters. Based on finding, it can be concluded that college campus covered with vegetation is adequate to curb pollutants from the air.

Build Up Area of the Institute	1908.397 sq./M (3 storey building)
Area of Plantation	50%
Total Area	0.33 hectares

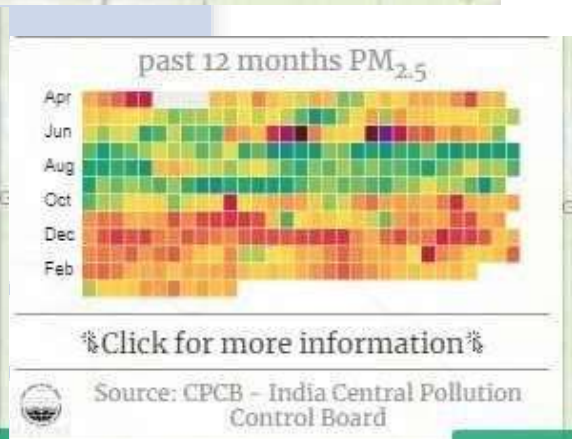
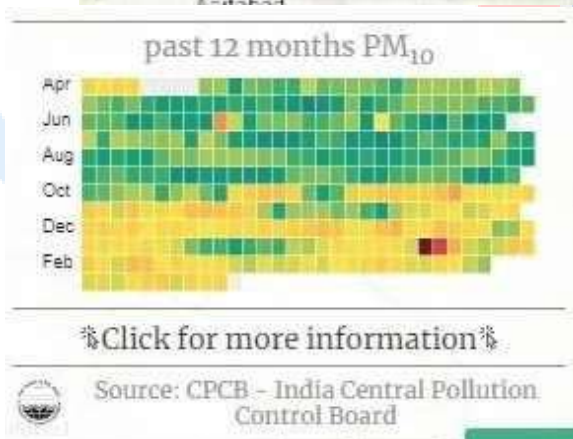
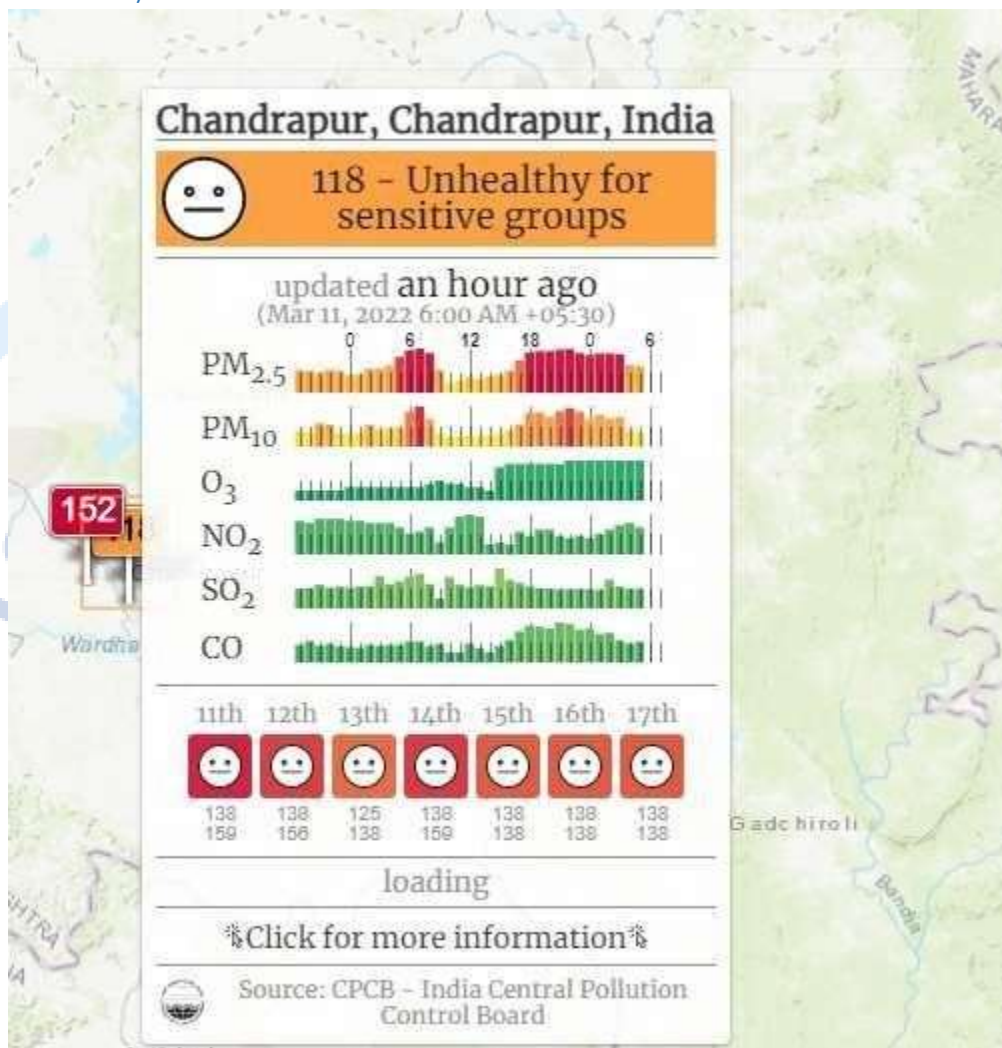
Air quality in college campus

1. Temperature

Average Temp of Summer	45°C
Average Temp of Winter	20°C
Average Temp of Rainy Season	30°C

The climate of Chandrapur has a hot and dry. December is the coldest month.

2. Air Quality Index



Dust collected over a period of time shows slightly higher concentration because of nearness of college to Thermal power plant, but green vegetation of college is effective to reduce dust pollution.

Noise quality assessment report

The most crucial aspect of the noise management programme is noise quality measurement. It provides information about potential noise-generating areas in the workplace, as well as students and employees who may be affected. Noise measurements taken during peak hours provide useful data for planning, preventing, and managing noise in the workplace. If there is a noise problem in the workplace, it is useful to track noise measurements taken at several locations.

Sound Meter Results

Location	Noise Level In dB
First floor	40
Open passage- First floor	42
Ground floor	48
Library	31
Open Ground	68
College Office	48
Outside entry gate	76

Because the entry gate is located near Durgapur road, the noise level outside the entry gate is higher than the rest of the places.

Water management and quality assessment report

Working-place water quality is critical since it affects people's health and livelihoods. A primary requirement is the provision of safe and reliable water. Groundwater and privately owned R.O. systems are the primary sources of drinking water. The groundwater is treated by the R. O. unit on the ground floor, first floor and second floor prior to being used by students and staff. Water is used by directing it towards the area that leads to the plantation after it has been used. The front-side rainwater harvesting equipment is operating at maximum percolation of rainwater. Water used in laboratories is diluted before being disposed of in a sewer line, where it mixes with sewage. Ground Physical and chemical properties of water used for drinking and laboratory purposes are measured. The College's Department uses air conditioners condensed water from the campus, so the cost of producing distilled water by traditional distillation is reduced, and capital and electricity are saved.

Source of Drinking Water	Bore Well, Other
Source of Water that requires other than drinking	Bore Well
Hardness of Water	650mg/l (R.O.100 mg/l)
pH of Water	7.4
Quality of Water	Good

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Soil quality assessment report

The goal of the soil quality assessment is to protect and improve the soil on campus while also increasing its fertility for plant development. The level of organic matter in soil is the most significant factor in sustaining soil quality. Litterfall in plantation areas is more than enough to keep soil organic matter at a healthy level. The following are the results of soil samples taken from the campus area.

Soil Quality Parameter	Concentration
pH	8.1
Chloride mg/l	510
Organic Matter %	1.2

VISUAL TEST (Main Campus Area)

Particle Type:	Fine grained (cohesive) & Granular (sand/sift or gravel)
Water Conditions:	Seeping Water
Type of material used to make Road	Cement, Gravels
Fertility of Land	Semi Fertile



Figure 5- Road inside the college

Tree species diversity in the college premises

The majority of the trees are planted with the goal of lowering carbon dioxide levels in the atmosphere. The trees on the college campus help to stabilize the soil, provide habitat for diurnal and nocturnal creatures, and provide shelter for invertebrates. During the university examinations in the summer, trees on campus protect students from other colleges from the heat. Planting ornamental trees helps to maintain the aesthetic quality of the area. The college's plantation program had been in place since its founding. During an on-site visit, the following tree species were seen.

List of Tree Species in the college premises

Sl. No.	Vernacular Name	Botanical Name	Family Name	Number
1.	Teak (Sagwan)	<i>Tectona grandis</i>	Verbenaceae	02
2.	Karanj	<i>Pongamia pinnata</i>	Fabaceae	05
3.	Shisam	<i>Dalbergia sissoo</i>	Fabaceae	03
4.	Gulmohar	<i>Caesalpinia species</i>	Caesalpinioideae	01
5.	Gulmohar	<i>Peltophorum pterocarpum</i>	Caesalpinioideae	01
6.	Neem	<i>Azadirachta indica</i>	Meliaceae	04
7.	Jamun	<i>Syzygium cumini</i>	Myrtaceae	01
8.	Nilgiri	<i>Eucalyptus species</i>	Myrtaceae	02
9.	Ashoka	<i>Saraca indica</i>	Caesalpinioideae	03
10.	Ghanti	<i>Cascabela thevetia</i>	Apocynaceae	01
11.	Cotton Silk	<i>Ceiba pentandra</i>	Malvaceae	05
12.	Sitaphal	<i>Annona squamosa</i>	Annonaceae	01
13.	Mango	<i>Mangifera indica</i>	Anacardiaceae	01
14.	Pygmy date Palm	<i>Phoenix roebelenii</i>	Arecaceae	04

Table 1: List of trees in college campus

E-waste disposal and management

Because of technological advancements, the use of electronic devices is increasing at a quicker rate. People are buying more advanced electronic equipment while discarding older ones, resulting in an increase in E-waste generation. E-waste contains harmful compounds such as cadmium, chromium, and PCBs, which pose a health concern. On a college campus, e-waste creation is at a minimum. **Because there is no adequate e-waste collection facility in the city, e-waste created in the college is simply handed over to a scrap collector.**

Solid waste management

Solid waste is a heterogeneous material that must be disposed of in a methodical and environmentally conscious manner. The administrative office and the campus generate solid trash in college. Solid garbage generated on campus is separated and placed in green and blue collection receptacles. The Chandrapur Municipal Corporation has set up a system to collect solid trash on a regular basis. Plant litter is gathered and decomposed in a specially constructed plastic bags. The configuration of laboratories' ventilation is efficient in reducing gaseous waste.

Electrical power consumption

Electrical power usage is linked to people's living standards, city growth, industry, and transportation sectors. Electricity is required to do normal tasks. By replacing obsolete fluorescent lighting with LED bulbs and tube lights, the college is committed to reducing electricity use. Students and staff are aware of the need of conserving energy by turning off electrical equipment when they are not in use.

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Recommendations

Issue	Recommendation
1. Higher Noise level at Main Gate	<ol style="list-style-type: none">1. Make a Green Canopy (Dense plantation) along the side of the college border.2. Display No honking board or Sound Limit Board outside the gate.
2. Dust Particles from Thermal Power Plant	<ol style="list-style-type: none">1. Denser plantation inside the college campus.
3. Proper disposable procedure for Chemical waste from Lab is not installed	<ol style="list-style-type: none">1. Make a proper provision for the disposal of chemical waste.
4. Proper E-waste disposable	<ol style="list-style-type: none">1. Find Out vendors from other cities for proper disposable.
5. Other	<ol style="list-style-type: none">1. Display of Switch off Light, Energy saving, water Saving boards in Each Classroom, Staff rooms, and all Labs.2. Display of Use Dustbin boards in college premises.3. Display Parking board at proper Places.4. Prepare one medicinal Garden.5. Display No smoking and No tobacco boards.

As per the recommendation given by the Environmental Auditor, Dr. Khatri Mahavidyalaya installed a botanical garden inside the college campus. List of plants which are present in botanical garden is attached with this report as a proof.

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- 1) Tulsi — *Oscimum sanctum*.
 - 2) Jagamath — *Vinca rosea*.
 - 3) Aloe vera — *Aloe vera*.
 - 4) Ashwagandha — *Withania Somnifera*.
 - 5) Bhui neem — *Endrographis peniculata*.
 - 6) Bhui Awala — *Eclipta prostrata*.
 - 7) Papermint — *Mentha piperita*.
 - 8) Bryophyllum — *Species*.
 - 9) Bringraj — *Eclipta prostrata*.
 - 10) Shafarani — *Asparagus racemosus*.
 - 11) Lasun — *Allium sativum*.
 - 12) Astulsa — *Adathota vasika*.
 - 13) Khandu chakka —
 - 14) Gudvel — *Tinospora cordifolia*.
 - 15) Khandu chakka — *Ehretia laevis*.

Discussion

- The results of the green audit components are shown in sections 1.1, 1.2, 1.3, 1.4, and 1.5.
- The physical and chemical parameters of R.O. water show most aesthetic values except for calcium hardness and chloride.
- The analysis of tap water for physical and chemical parameters shows the concentration of hardness above the permissible limit, usually seen in groundwater.
- Noise levels observed in various places show higher values due to road traffic and students' activities.
- Soil quality of the college campus shows better conditions for plantation. The organic matter indicates good soil quality.
- Insoluble particles and soluble particles in the air show the air quality of the college campus.
- Biomass estimation is discussed based on the circumference and basal area of the tree species.

Conclusion

The green audit of the college campus has shown a clear picture of the environmental status and highlights areas for improvement. The data can be used to implement further green initiatives and promote sustainable practices within the campus.