



Dr. Khatri Mahavidyalaya,
Tukum, Chandrapur, Maharashtra India



Report Prepared By
TLCs Nagpur

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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

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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.



GREEN AUDIT REPORT

2024-2025

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Preface

Nature provides free services to all. In recent years, environmental problems have increased by human activities and development of science and technology and planet earth is facing tremendous pressure from increases in population. The planet is becoming warmer by most discussed phenomena, The “Global warming”. Quality of water, air, noise and soil is deteriorating beyond recovery. In order to know more about environmental degradation, there is need to identify them and implement mitigation measures for environmental protection.

Sustainable development is becoming popular in the world for saving the earth. Utilising resources in judiciously can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

Environmental auditing had begun in the early 1970s with provision of civil lawsuits for non-compliance with environmental regulations. Green auditing involves on site visit, collection of samples, performing analyses, and report results to competent authorities. Industry, the corporate world is initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

In the present write up “Green Audit” report, outline existing scenario of campus. A brief content of this report would help everyone to think about preserving resources, show willingness to learn their importance, adopt steps to minimize resource use and set an example for others to follow the path of green practices to achieve the goal of sustainable development.

We express our deep sense of gratitude to the Chairman of the of Dnyandeep Shikshan Prasarak Mandal, Dr. N. H. Khatri and management body of DSPM and Dr. J. M. Kakde, Principal of the college for their support in preparation of the report.

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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.

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.

3. Land use observation

The total area of Dr. Khatri Mahavidyalaya, Tukum, Chandrapur 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.

4. Tree species diversity in and outside the college premises

Most of the trees are planted keeping in mind to reduce carbon dioxide from the atmosphere. Trees of the college campus are effective to stabilise soil, it provides habitat for diurnal as well as nocturnal animals, gives shelter to invertebrates. Trees of college campus protect students from different colleges from heat waves in summer during the university examination. Aesthetic quality is maintained by planting ornamental trees. The plantation programme had been implemented since inception of the college. The following tree species are observed during on- site visit in the college and area outside college (Table 1).

5. Estimation of biomass

Estimating tree biomass, both within and beyond the institution, offers valuable benefits like gathering carbon sequestration data, fostering environmental education, facilitating green infrastructure planning, encouraging community engagement outside the institution, and enhancing institutional identity. Students from the Department of Environmental Science utilized this opportunity to measure the biomass of trees both within and beyond the institution to achieve the desired outcomes. A study estimating the biomass within the college and its surrounding areas revealed a carbon sequestration rate of **26.95%**.

OBSERVATION TABLE (SUMMER 2024)

Sr.no	Name of trees	Botanical name	Width (inch)	DBH (m)	Basal Area(m ²)	SB (Tonne)	Carbon (%)
1	Teak	Tectona grandis	36.4	0.115	0.788	53.91	26.95
2	Shisam	Dalbergia sissoo	74.0	0.598	0.280		
3	Teak	Tectona grandis	39.0	0.315	0.077		
4	Karanj	Millettia pinnata	43.5	0.352	0.097		
5	Gulmohar	Delonix regia	125.6	1.015	0.809		
6	Karanj	Millettia pinnata	77.0	0.623	0.304		
7	Umbrella Tree	Schefflera arboricola	35.0	0.283	0.062		
8	Shisam	Dalbergia sissoo	75.9	0.614	0.296		
9	Umbrella Tree	Schefflera arboricola	33.2	0.268	0.056		
10	Neem	Azadirachta indica	56.9	0.426	0.166		
11	Nilgiri	Eucalyptus	59.0	0.477	0.178		
12	Nilgiri	Eucalyptus	51.0	0.412	0.333		
13	Neem	Azadirachta indica	53.3	0.428	0.143		
14	Neem	Azadirachta indica	44.0	0.356	0.099		
15	Cottonsilk Tree	Ceiba pentandra	48.0	0.388	0.118		
16	Cottonsilk Tree	Ceiba pentandra	41.0	0.331	0.086		
17	Cottonsilk Tree	Ceiba pentandra	50.1	0.405	0.128		
18	Cottonsilk Tree	Ceiba pentandra	26.0	0.210	0.034		
19	Cottonsilk Tree	Ceiba pentandra	25.1	0.203	0.032		
20	Karanj	Pongamia pinnata	83.4	0.674	0.356		
21	Mango	Mangifera indica	33.4	0.27	0.057		
22	Karanj	Pongamia pinnata	38.9	0.314	0.077		
23	Neem	Azadirachta indica	42.0	0.339	0.090		
24	Karanj	Pongamia pinnata	43.9	0.355	0.098		
25	Teak	Tectona grandis	42.0	0.339	0.090		
26	Palm tree	Arecaceae	36.0	0.291	0.067		
27	Neem	Azadirachta indica	49.0	0.396	0.123		
28	Champa tree	Magnolia champaca	34.0	0.275	0.059		
29	Neem	Azadirachta indica	41.0	0.331	0.075		
30	Neem	Azadirachta indica	45.0	0.364	0.104		
31	Neem	Azadirachta indica	67.8	0.548	0.235		
32	Banyan	Ficus benghalensis	91.5	0.74	0.430		
33	Neem	Azadirachta indica	44.9	0.364	0.104		
34	Kassod tree	Senna siamea	34.0	0.275	0.059		
35	Kassod tree	Senna siamea	26.0	0.210	0.034		
36	Peepal tree	Ficus religiosa	32.5	0.263	0.054		
37	Gulmohar	Delonix regia	80.0	0.647	0.328		
38	Neem	Azadirachta indica	35.0	0.283	0.062		
39	Umbrella tree	Schefflera arboricola	51.0	0.412	0.133		
40	Neem	Azadirachta indica	54.0	0.437	0.15		

Table 1: Tree species diversity in and outside the college premises

A medicinal plant garden (**Table 2**) on a college campus serves as a hub of education, sustainability, and well-being. It provides an interactive platform for students and faculty to delve into subjects like botany, zoology, and environmental science, enriching their knowledge and hands-on learning experiences. These plants act as a natural source of herbal remedies, promoting awareness and practice of traditional medicine and holistic health approaches. Additionally, such gardens enhance biodiversity, support pollinators, and add to the campus's greenery, creating an eco-friendly and peaceful environment. They also play a significant role in community outreach, raising awareness about the importance of medicinal plants and inspiring sustainable practices. With their cultural and historical significance, medicinal plants offer a connection to heritage and traditional knowledge, while also enabling research on sustainable agriculture and the preservation of endangered species.

Sr.No.	Local Name	English Name	Botanical Name	Family
1	Bhui Neem	Bitter Weed	Andrographis paniculata	Gentianaceae
2	Tulas	Basil	Oscimum Scantum	Lamiaceae
3	Maka	False Daizy	Eclipta alba	Asteraceae
4	Shatavari	Asparagus	Asparagus racemosus	Asparagaceae
5	Ova/Ajawayan	Carom Seed	Trachyspermum ammi	Apiaceae
6	Bhui Aawala	Bhui Aamala	Phyllanthus niruri	Phyllanthaceae
7	Pen Korphud	Pencil Cactus	Euphorbia tirucalli	Euphorbiaceae
8	Lajalu	Mimosa	Mimosa pudica	Fabaceae
9	Halad	Termerik	Curcuma longa	Zingiberaceae
10	Adulasa	Adathoda	Adathoda vasika	Acanthaceae
11	Sadafuli	Vinka	Vinka rosea	Apocynacea
12	Korfad	Aloe	Aloe vera	Liliaceae
13	Paan	Betle Leaf	Piper seetle	Piperaceae
14	Sarpagandha	Sarpagandha	Raulfia Serpentina	Apocynaceae
15	Akkalkadha	May Weed Plant	Anacyclus pyrethrum	Asteraceae
16	Ashwagandha	Ashwagandha	Withania somnifera	Solanaceae
17	Gawati Chaha	Lemmongrass	Cymbopogon citratus	Poaceae
18	Adrak	Ginger	Zingiber officinale	Zingiberaceae
19	Paan Phuti	Bryophyllum	Kalonchoe rotundifolia	Crassulaceae
20	Khandu Chakka	Eharetia	Eharetia laevis	Borangiaceae

Table 2: Medicinal plants located within the college campus.



Figure 1: A green view of college campus

6. Faunal diversity in the college premises

The faunal diversity consists of both invertebrates and vertebrates. Invertebrates have occupied every ecological niche. Vertebrates depend on invertebrates for food. It is very essential to record their existence for balance of nature. Presence of vertebrates and invertebrates were simply noted by sighting. The faunal diversity sighted and observed at different time interval is depicted in Table

Table 3: Faunal diversity of college campus

Sr.No.	Fauna	Scientific Names
1.	Spiders	Artema Atlanta; Hersilia savignyi; leucauge decorate; Nephila pilipes.

2.	Butterflies	Hasora chromus; Hasora taminatus; Hasora vitta; Badamia exclamationis; Burara jaina; Hasora badra; Suastus gremius.
3.	Insects	Onitis, Phalops, Chironitis, Gymnopleurus Parvus,
4.	Mammals	Squirrel (Funambulus),
5.	Birds	Acridotheres tristis (Common myna); Pycnonotus cafer (Redvented Bulbul), Dicrurus Macrocerus (Black Drongo), Sparrow (Passeridae Spp.), Columba livia)
6.	Amphibia	Tree Frog (Polypedates Maculatus), Indian Toad (Duttaphrynus Melanostictus)
7.	Reptile	Wall Lizard(Hemidactylus Frenatus), Calotes Versicolor

7. Air quality in college campus

The climate of Chandrapur has a hot and dry. December is the coldest month, with a minimum average temperature of December is 9 °C and a maximum average temperature remain around 23.2 °C. The mean maximum temperature of the month May is 43 °C. June and September are the months of monsoon. Chandrapur typically experiences an annual average rainfall of around **1251 mm**, with the majority occurring during the monsoon.

Coal based Thermal Power Station is located in Chandrapur district in the state of Maharashtra. Air quality study was limited upto collection of near deposited dust particles by the Dust Fall Jar method. The average findings of dust particles are presented in Table 4.

Table 4: Air borne particle analysis

Location	Insoluble particles g/m ² /month	Soluble particles g/m ² /month	Total particles g/m ² /month
College top terrace	0.41	0.22	0.63

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.

8. Water management and quality assessment report

Water quality of working place is paramount as it is related to human health and livelihoods of people. Supplying clean and reliable water supplies is a prime necessity. The source of drinking water supply is majorly ground water and privately owned R.O. (reverse osmosis) supplier. The ground water is treated by R. O. unit on the ground floor and first floor prior being used by students and staff. Water after use is directed towards the area which goes to the plantation, so water is utilized. Rainwater harvesting unit installed at front side is working with maximum percolation of rain water. Water used in laboratories comes out as waste water is diluted prior to disposal in sewer line where it mixes with sewage. Ground Water required for drinking and laboratory purpose is analysed for physical and chemical parameters. Department of the College makes use of Air conditioners, water as distilled water brought from the college campus which is free, so burden of production of distilled water by conventional distillation is minimized with a saving of capital plus electricity. The water analysis report is depicted in Table.5

Sr. No.	Parameters	Unit	Ground	IST Floor	IIND Floor	Tap Water
1	pH		6.9	7.6	7.0	7.0
2	Temperature	°C	26	26	28	27
3	Conductance	Us/cm	105	49	70	842
4	Total Hardness	mg/l	50	50	90	295
5	Calcium Hardness	mg/l	180	160	100	210
6	Chloride	mg/l	4.2	5.8	2.6	3.0
7	Alkalinity	mg/l	4.0	1.6	1.4	30
8	Acidity	mg/l	BDL	BDL	BDL	BDL
9	Dissolved Oxygen	mg/l	7.7	6.7	7.4	4.5

Table 5: Physical and Chemical Analysis of Water Sample

It has been observed that groundwater drawn from bore wells contains a higher concentration of salts, which may affect its taste. However, this water is treated using an R.O. (Reverse Osmosis) plant to make it suitable for drinking. An analysis of the borewell water on campus indicates lower hardness, measuring 295 mg/L, compared to nearby borewell samples, which show a hardness of approximately 400 mg/L. This reduction in hardness is attributed to the rainwater harvesting practices implemented on the college campus over the past five years. These practices can serve as a model to guide the nearby community in constructing their own rainwater harvesting structures.

9. Noise quality assessment report

Noise Quality Measurement is the most important part of the noise control program. It imparts information about potential noise generating places in workplace, students and staff likely to be affected. Noise measurement during busy hours gives valuable numbers which may be useful for planning, avoiding, controlling noise at the workplace. Following noise measurements made at different locations is useful to consider noise if there is a noise problem in the workplace.

Location	Noise Level (decibel-Db)
First floor	28
Open passage-first floor	34
Ground floor	30
Library	28
Open ground	75
College office	46
Outside entry gate	95

Table 6: Monitoring noise levels across various locations.

It is observed that noise level outside entry gate is higher than rest of locations, as the entry gate is situated adjacent to Durgapur road.

10. Soil quality assessment report

The purpose of Soil quality assessment is to protect and improve soil in campus, increase its fertility for plant growth. The basic thing about soil is content of organic matter in it which is important in maintaining soil quality. Litter fall in plantation area is altogether sufficient to maintain soil organic matter. Soil samples collected from campus area show the following results.

Soil Quality Parameter	Concentration
pH	8.4
Chloride mg/l	550
Organic Matter %	1.24

Table 7: Analysis of soil quality parameters.

11.E-waste disposal and management

The use of electronic equipments is growing faster due to advancement in technology. The quantity of E-waste generation is increasing as people buy advance electronic equipments while dumping old one. E-waste carries health risks as it contains toxic materials such as cadmium, chromium, PCBs. E-waste generation is minimum in college campus. E-waste generated in college is simply handed over to scrap collector as proper e-waste collection facility is not available in the city.

12. Solid waste management

Solid waste is heterogeneous material and hence need to be disposed off systematically with due care of the environment. Solid waste generated in college comes from administrative office and the campus. Solid waste generated in college is segregated and put into collection bins marked as green and blue. Chandrapur Municipal Corporation has made arrangement to collect solid waste. Ventilation arrangement of laboratories is effective to reduce gaseous waste.

13. Electrical power consumption

Electrical power consumption is related with the standard of living of the people, the growth of cities, industries and transport sectors. Use of electricity is essential to carry out routine work. The college is committed to reduce consumption of electricity by replacing old fluorescent lamps with LED bulbs and tube lights. Students and staff are aware to minimize electric consumption by switching off electrical appliances when not in use.