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# **AUDIT CERTIFICATE**

This is to certify that the "Green audit report" for Government Pataleshwar College Masturi, Bilaspur (C.G.) has been conducted in December and January, 2019 to assess the green initiatives planning and efforts implemented in the college campus like green campus management, Plantation, post plantation management, waste management and Rain water harvesting.

The green audit is also aimed to assess the impact of green initiatives for maintenance of eco-friendly campus.

Place -- Masturi

Date - 22.01.2019

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### Acknowledgement

Green Audit Assessment Team thanks the Govt. Pataleswar College Masturi, Bilaspur C.G. for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks to our Principal – Dr. ManjuTripathiTeam of colleagues for giving us necessary inputs to carry out this very vital exercise of Green Audit. This Audit has been conducted by a committee constituted by Principal with following members: Prof. B.S. Raj, Prof. N. K Relwani, Shri D.K. Shukla Campus Administration. Data collected with the help of student volunteers, the basic data was compiled, by the Department of Zoology and Botany. The audit reveals a healthy environment in campuses.

We are also thankful to Dr. Rajesh Chaturvedi (IQAC Co-ordinator), Mrs. KantiAnchal(NSS Programme Officer), Mrs. Neeta Jauhar(NCC Programme Officer), and other staff members who were actively involved while collecting the data and conducting field measurements.

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## **EXECUTIVE SUMMARY:**

The rapid urbanization and economic development at local, over exploitation of ecological resources of regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institute which will lead for sustainable development.

The term "Green" means eco-friendly or not damaging the environment. This can acronymically is called as "Global Readiness in Ensuring Ecological Neutrality" (GREEN).

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings.

The purpose of the audit was to make sure that the practices followed in the campus are healthy and environment friendly. With this in mind, the specific objectives of the audit were to evaluate the degree to which the Departments are in compliance with the applicable regulations, policies and standards and to ensure that the development of the college aims at sustainable development and green campus.

A report on green audit has been prepared by department of Zoology Department of Govt. PataleshwarcollegeMasturi. This college was established in 1982 in fine tune with the motto of तगसोगॉज्योतिर्गगय (Looking forward to darkness to lightness) and accredited with Grade 'B' by NAAC, Bengaluru. Total area of the college main campus 14 acres, of which 40 percent is covered by herbs, shrubs and trees, including valuable medicinal flora. The plants have been systematically identified by the green audit committee. There are more than 100 plant species were audited. The green audit report has been discussed with environmental expert's suggestions to increase greenery in campus. Extra efforts have been taken by the college to create environment consciousness amongst students. One major step in this regard is the extensive plantation program organized by NSS, NCC, Environmentcommittee , Existing gardens are also maintained by the Environment committee of this college and also NSS and NCC wing.

Plantation is encouraged by principal and faculties of all departments to increase greenery and reduce carbon emission effects. The college also looking forward to the recycling projects or solid waste management programs to improve waste minimization plan and initative about energy and water conservation, plantation and also loking farword to alternative source of energy (Solar Plant).

It can make a tremendous impact on student health and learning college operational costs and the environment. The methodology used included physical inspection of the campus and observation and review of the relevant documentation were used to prepare green audit report of the college. Green auditing and implementation of suggestions plays a significant role to make an eco-friendly ambience.

1.	Name of Institution	Government PataleshwarCollege Masturir, Bilaspur (C.G.)
2.	Geographical status	Lat N 21 <sup>0</sup> 9930 Long E 82 <sup>0</sup> 2764
3.	Address of the Institution	Kosamdih Road, Masturi, Bilaspur (C.G.)
4.	College Affiliated to	AtalBihari Vajpayee Vishwavidyalaya, Bilaspur (C.G.)
5.	Name of Principal	Dr. ManjuTripathi
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	Website.	www.gpcmasturi.co.in

### **INTRODUCTION:**

The 'Green Audit' aims to analyse environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. To achieve the goal, the college organizes motivational and inspiring talks by experts, and conducted awareness programs. The Zoological club, Science club highlight the significance of environment and its protection.

Green auditing is a means of assessing environmental performance (Welford, 2002). It is a systematic, documented, periodic, and objective review by regulated entities of facility operations and practices related to meeting environmental requirements (EPA, 2003). It is a total strategic approach to the organization's activities (CBI, 1990).

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility

of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

### **ABOUT THE COLLEGE:**

As an oldest institution in Masturi region the Government Pataleshwar College, Masturi, Bilaspur is primarily known as Government College Masturi that was established in 1988. The UGC accorded it recognition under section 2 (f) & 12 (B) on 18th February, 1998 and 22<sup>nd</sup> June 1998 respectively. Earlier this institution was affiliated to Guru Ghasidas University, Bilaspur from 1988 to 2012, then Guru Ghasidas University, Bilaspur has been upgraded as Central University and presently the college is affiliated to AtalBihari Vajpayee University, Bilaspur a newly established university of Chhattisgarh state.

The College is situated in 18 k.m. far of theBilaspur city and has campus of 14 acres, which consist of class rooms, administrative buildings, playground, auditorium, well equipped library, computer lab and l. The College has N.S.S. units sanctioned by the university, N.C.C. units sanctioned by CG. B.N.C.C. Bilaspur, and Alos have Youth Red Cross Society which are doing tremendous job through organizing activities like blood donations, tree plantations, health check-up, personality development etc. are conducted by this unit. The N.S.S. unit of the college adopted village ITWA. The campus is also selected for the Unnat Bharat Abhiyan by the Government of India in the year 2018. Every year the College is organizing NSS camp for period of 7 days for taking up Awareness campaign, Sanitation, Tree Plantation, De-addiction, literacy, etc. with help of the villagers and concerned authorities. Cadet of N.C.C. can also joind the camp organized by 7cg battalion, Bilaspurby every year.

The college campus is spreded in 15 acar area. The details of the college campus is as under

Particulars	Name of building/ area	Built up/ Occupied area
	Administrative building	1532.91 sq meter
Duildings	RUSA Building, Seminar hall	1485 sq meter
Dunungs	Old college Building	743.60 sq meter
	Girls Common room	70.23 sq meter

#### **COLLEGE CAMPUS AREA:**

	Seminar hall -1	81.84	sq meter
	Garden located in front of sports	58.50	sq meter
Condon anos	(NCC)		_
Garden area	Garden located in front of the 38		sq meter
	administrative block		_
Vehicle stand	Vehicle stands 1	126	sq meter
	Vehicle stands 2	240	sq meter
	Total	4727.24	sq meter
Open play ground Open area/ play ground			51 sq meter
<b>Total Campus area</b>	60702.8	35 sq meter	

### **OBJECTIVES OF GREEN AUDIT:**

The general objective of green audit The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment and prepare report on biodiversity and other resources in college campus.

The main objectives of carrying out Green Audit are:

- 1. To introduce and aware students to real concerns of environment and its Sustainability.
- 2. To enable waste management through reduction of waste generation, solidwaste and water recycling
- 3. To prepare a checklist of flora and fauna diversity in and around the college campus.
- 4. Impart environmental education through systematic environmental management approach and Benchmarking for environmental protection
- 5. To secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use of the campus.
- 6. To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- 7. To bring out a status report on environmental compliance.
- 8. Measuring the impact of various organized programe and best practices on environmental factors.
- 9. Financial savings through a reduction in resource use .
- 10. To suggest measures to improve biodiversity within the college campus.

#### **METHODOLOGY**:

The purpose of the green audit of Masturi College is to ensure that the practices followed in the campus are in accordance with the Green Policy adopted

by the institution. The methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations.

The study covered the following areas to summarise the present status of environment management in the campus:

- 1. Water management
- 2. Waste management
- 3. Energy Conservation
- 4. E-waste management

#### GENERAL STEPS

The following steps were undertaken during auditing –

- 1. The data were collected by using facilities available in science departments, NSS volunteers, greenery auditing committee and energy audit committee
- 2. The utilization of natural resources was periodically evaluated by regular observation and also by using equipments and appropriate standard measuring techniques
- 3. Implementation of various suggestions recommended by the various committees.
- 4. The data were prepared by physical evidences
- 5. Improvement and management of existing system.

#### AUDIT FRAMEWORK AND DETAILED FINDINGS

The following audit framework is used for conducting Green Audit in 2020-21.

Objective	Observation	Audit observation
Energy Management	Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon- neutral electricity	The college does not have any choice other than CSEB for electric supply. The college also has 1 ecofriendly generators for the supply of emergency electricity to save our ecosystem.
	Look in to the possibility of on-site micro-generation of renewable electricity.	The college is planning for introduction of SOLAR PANNELs.

	Give preference to the most energy efficient and using energy-saving light bulbs	The college is using LED lights as much as practicable
	A viability of Energy consumption measurement equipments	No the college has not any Energy consumption measurement equipments
Green campus	No use of fertilizers and pesticides in college campus mostly we are using of vermi compost produced on site .	Yes, the college has two large wormi composting tanks to decompose and recycled the biodegradable substances.
	Encourage the faculties and students to plant trees in the garden.	The college celebrates "BanaMahotsab", an annual tree plantation program in the campus where students and teachers plant trees in the campus
	Dispose the chemical waste generated from the laboratories in a scientific manner	Non toxic chemicals are practical curriculum. Most of the waste generated is water- soluble and ultimately disposed through normal sewage systemin deep soil.
	Establish a Garden in the campus College already has a well maintained garden.	Establish a Garden in the campus College already has a well maintained garden.
Water Management	Hygienic water for drinking	There are two Water filter with RO (Aqua guard) in the college for the students.
	Repair sources of water leakage, such as dripping taps.	Regular checking and maintenance of pipelines are done to control water wastage.

	Water recycling System, such as rain water harvesting system	The college has only one centralized water harvesting system, established in RUSSA building.
Waste management	Compost, or cause to be composted, all organic waste, green waste and collected from gardens, offices	The college has set up a vermi compost plant that ensures proper treatment of all organic wastes.
	Recycle or safely dispose of dry wastes computers and electrical appliances	All dry wastes (paper, metal, glass, other dry waste, e- waste, etc.)are separated in different bins in the college and resell to the local vendor
Carbon foot print	Ensure use of eco friendly transport option	About 80% of the students of the college use bicycle as the main mode of transport. The college also encourages transport by bicycle to students.
	Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.	Seminars and awareness programmes are conducted periodically on nature and natural resources.
Auditing of flora	Observation, Labeling and documentation of flora	Yes, College has a survey report of faunal diversity occurs in the vicinity of the college. This survey was conducted by the department of botany and Zoology. In this survey report the available plants were categorized into herbs, shrubs, trees, flowering plants and decorative plants. In this report has described

		the local name, botanical name, number and uses of the plants species occurs inside the campus of the college. <b>Note</b> – Table no. 01. Showing the faunal diversity of the college
	Labeling of plants	The larger plants were labeled with their local and botanical name. The name plates were prepared by the students of botany and Zoology department under the guidance of Head of the Botany department.
Auditing of fauna	Observation and documentation of flora and fauna	The department of zoology has observed and documented the animal diversity in the campus.
Women hygiene facility	Women hygiene equipment	Yes, College has sentry pad equipment for the female students.

The floral and faunal Diversity of Pataleswar College campus has been studied and documented as below-

#### Table no. 01 Showing the floral diversity of the college

S.	Category	Common	Botanical name	Number	Significance/
Ν		name			Uses
0.					
1.	Herbs	मोंगरा	Jasminumsambac	12	Flowering
		पत्थरचट्टा	Bryophyllumpinnatum	26	Medicinal
		तुलसी	Ocimumtenuiflorum	15	Medicinal

		नागफनी	Crataegus	05	Medicinal
		विश्णुकांती	Clitoriyaaternatea	12	Medicinal
		सतावर	Asparagus racemosus	02	Medicinal
		बैजंती	Barleriaprionitis	06	Flowering
		जंगलीमुनगा	MoringaOleifera	04	Medicinal
		चित्रक	Plumbagaozeylanica	04	Medicinal
		जंगनीलहसुन	Allium tuberosum	02	Medicinal
		हल्दी	Curcuma domestica or longa	02	Medicinal
		लिली	Plumeria Alba	01	Medicinal
		जंगली धनिया	Ergyngiumfoetidum	02	Medicinal
		रामतुलसी	Ocimumgratissimum	10	Medicinal
		घृतकुमारी	Aloe vera	15	Medicinal
		मण्डुपर्णी	Centellaastitica	02	Medicinal
		कचनार	Baihidiaforfi	01	Medicinal
2.	Shrubs	नीबू	Citrulluslimonus	04	Medicinal
		मदार	Hibiscus rosasinensis	04	Glowering
		कनेर	Nerium oleander	26	Flowering
		गेंदा	Tagetes	256	Flowering
		अडूसा	Adhatodavasica	05	Medicinal
		धतूरा	Daturastramonium	12	Medicinal
		जीरा	Cuminumcyminum	12	Medicinal
		चॉदनी	Tabernae Montana divaricata	03	Flowering
		आंक	Calotropis gigantean	10	Medicinal
		सर्पगंधा	Rauwolfiaserpentina	26	Medicinal

		करौंदा	Carissa carandas	02	Fruit/
					Medicinal
		साइकस	Cycasrotundus	02	Decorative
		रातरानी	Cestrum nocturnum	1	Flowering
		गुलाब	Rosa indica	14	Flowering
		नागफनी	Opuntiaficcus	11	Flowering
3.	Decorative	कागजफूल	Bougainvillea	09	Flowering
		सदासुहागन	Catharanthusroseus	48	Flowering
		विद्यामती	Thujaoccidentalis	03	Flowering
		मनीप्लांट	Money plant	10	Decorative
		अमरबेल	Cuscutareflexa	12	Decorative
4.	Tree	आम	Mangiferaindica	65	Fruit
		ऑवला	Phyllanthusemblica	25	Fruit
		बादाम	Pranusdulcis	04	Fruit
		रामफल	Anonaraticulata	02	Fruit
		अमरूद	Psidiumguajaw	05	Fruit
		बेर	Zizyphuslionba	07	Fruit
		अनार	Punicagranatum	03	Fruit
		डूमर	Ficusracemosa	01	Fruit
		ताड़	Borassusflabellifer	02	Fruit
		जामुन	Syzygiumcumini	05	Fruit
		खजूर	Phoenisdactylifera	01	Fruit
		नीम	Azadirachtaindica	14	Medicinal
		बरगद	Ficusbenghalensis	04	Medicinal
		पीपल	Ficusraligiosa	03	Medicinal

	चम्पा	Plymariyaaabtusa	05	Medicinal
	कदम	Neolamarckiacadamba	08	Medicinal/ decorative
	सागौन	Tectonagrandis	18	Furniture
	बबुल	Vachellianitotica	32	Furniture
	अ" गेक	Saracaindicus	12	Decorative
	नीलगिरी	edcalyptus	05	Medicinal

Table no. 02 Showing the faunal diversity of the college

No.	Phylum	Common Name	Zoological Name
1.	Annelida	Earth worm	Pheretimaposthuma
		Neries	Nerismania
		Leech	Hirudomedicinalis
2.	Arthropods	Ant	Formica <i>rufa</i>
	-	Red ant	Atta geminata
		Cockroach	Periplanataamericana
		Book Worm	Lepismasaccharina
		Grasshopper	Melanopusfemurrubrum
		Centipede	Scolopendraspp.
		Praying Mantis	Mantis <i>religiosa</i>
		Termite	Dry wood termites
		Butterfly	Danausplexippus
			Morphofabricia
		Makkhi	Muscadomestica
		Mosquitoes	Culex and Anopheles
		Recluse spider	Loxosceles <i>spp</i> .
		Striped back scorpion	Centruroidesvittatus
		Odonatan Species (Drogonfly)	Orthetrum <i>pruinosum</i> ,
			Brachythemiscontaminate,
			Diplocodestrivilis,
			Neurithemisintermedia,
			Acisomapanorpoides, Pantalaflavescens
		Paper Wasps	Polistes <i>spp</i> .
		Blister Beetles	Spicaula <i>spp</i> .
		Fire fly	Lamrtidae
		Drogonfly	Anisoptera
		Yellow jacket insect	Vespulasquamosa
		Cicada killer	Spheciusspeciosus
		Mud Daubers	Chalybionsceliphron
		Locust	Schistocercagregaria
		Honey Bee	Apismellifeera and Apisindica
		Crab	Carcinusmaenas
3.	Mollusca	Pila	Pilaglobosa
		Unio	Uniocariel
4.	Amphibians	Commom Frog	Ranatigrina
		Common Tree Frog	Polypedates maculates and P.racophorus
		Indian bull Frog	Hoplobatrachustigerinus
		Toad	Buffomelanostictus
		Green puddle frog	Occidozygalima
		Common Toad	Bufo <i>bufo</i>

5.	Reptiles	Lizards - Common wall lizard	Podarcismuralis
	_	Monitor Lizard - Goh	Varanusbengalensis
		Brooks Gecko	Hemidactylus brook
		Banded krait, Ahiraj	Bungarusfasciatus
		Binocelate Cobra Nag Sap	Naja <i>naja</i>
		Water Snake	Xenochrophispiscator
		Indian Rock Python Ajgar Sap	PythonMolurus
		Snake - Common Krait	Bungaruscaeruleus
		Common Rat Snake, Dhamana	Ptyasmucosus
6.	Aves	Pigeon	Columba <i>livia</i>
		House Sparrow	Passer domestica
		Koel	Eudynamysscolopaceus
		Myna	Acridotherestristis
		Eagle	Aquila hastata
		Fowl	Gallus gallus
		Crow	Corvus <i>splendens</i>
		Parrot	Pisttaculakrameri
7.	Mammal	Rat	Ratusratus
		Bat	Elidolonhelvum
		Mole	Condyluracristata
		Gilhari	Funambulus <i>pennantii</i>
		Newla	Herpestesedwardsi
		Cow	Bostaurus
		Dog	Canislupus familiaris
		Goat	Capra <i>aegagrushircus</i>
		Tabby cat	Feliscatus

### **Recommendations/ Suggestions**

- 1. Implement a mechanism to dispose solid waste in a scientific manner.
- 2. In campus make some small WATER BODY and recycle of water system is necessary.
- 3. It is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity
- 4. Gardens should be watered by using drip/sprinkler irrigation system to minimise water use.
- 5. In campus premises electricity should be shut down from main building supply after occupancy time, to prevent power loss due to eddy current
- 6. Installation of LED lamps instead of CFL and replacing the old tube lights with the new LED tubes.
- 7. Implement a scientific mechanism to dispose chemical waste from laboratories.
- 8. Celebrate every year 5th June as 'Environment Day' and plant trees on this day to make the campus more Green.

- 9. Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- 10.Review periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Assign scientific names to the trees.

### **CONCLUSION:**

With smart initiatives like our Think Green Campus Model, Waste Management is helping colleges achieve a higher level of environmental performance. There is significant environmental research both by faculty and students. The environmental awareness initiatives are substantial. The installation of solar panels and rain water harvesting system are noteworthy. Pataleshwar College adopts environment friendly practices and takes necessary actions such as – energy conservation, waste recycling, carbon neutral etc.. This may lead to the prosperous future in context of Green Campus & thus sustainable environment and community development. As part of green audit of campus, we carried out the environmental monitoring of campus including Illumination and Ventilation of the class room. It was observed that Illumination and Ventilation is adequate considering natural light.



Fig. 1 Government Pataleshwar College, Masturi (Administrative Block)



Fig. 2-5Plantation in front of the College building with SDM and Tahesildar and other.



Fig. 6 -9Extension activity related plantation and take care by NSS and Zoological Club in Pendri



Fig. 9-10 Removeunwanted grass within carpet grass by Zoological Club and NCC.



Fig. 11-12Wormicomposting tanks located beside of sport department



Fig. 13 Green campus of our College



Fig. 14 Generator for Electricity

Fig. 15 Water purifier pump



Fig. 16 Water harvesting System

#### Showing the faunal diversity of the college



Leech (Hirudomedicinalis)

Earthworm (Pheritimaposthuma)



House fly (Muscadomestica)

Cockroach (Periplanetaamericana)



Crab (Partunuspelagicus)

Ant (Formica *rufa*)





House cricketa (Achetadomestica)

Praying mantis (Mantis religiosa)



Butter fly (Morphofabricus)

Scorpion (Pandinusimperator)



Pila (Pilaglobosa)

Unio (Uniocariel)



Frog (OccidozygoLima)

Lizard (Hemidactylus*frenatus*)



Parrot (Psittaculakrameri)

Hen (Gallus gallusdomesticus)



Goat (Capra *aegagrushircus*)

Monkey (Semnopithecusposthuma)



Cat (Feliscatus)