## Green Audit

Bhagwan Mahaveer Education Society

# Preetam Prakash College



Prepared By Aarchit Venture Bharekar Estate Nanded Gaon Near Nanded City Pune 411041



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## 1. Introduction

The rapid environmental degradation at local, regional and global level is leading us to global "Environmental poverty". Stabilization of human population, adoption of environmentally sound and sustainable technologies, reforestation and ecological restoration are crucial elements in creating an equitable and sustainable future for all humans in harmony with nature and natural resources. The main objective to carry out green audit is to check green practices followed by university and to conduct a well formulated audit report to understand where we stand on a scale of environmental soundness. Green audit is the procedure of systematically identifying, quantifying, recordings, reporting and analyzing the environmental diversity components of any organization. It aims to analyze the environmental practices inside and outside of the relevant place, which will have an impact on the environment. Focus was given to assess the consumption of energy, electricity, water as well as disposal of liquid waste, solid waste, hazardous waste, e-waste and an inventory of trees on campus is also prepared to check how much CO2 is sequestered and O2 is released. It is an important tool for universities to determine their consumption of energy, water, or other resources; and then consider and planned to implement changes and make savings. It can create health awareness and promote environmental awareness and ethics. It allows faculty, students and other staff to better understand the impacts of green activities on the premises.

Self-inquiry is a natural and expected development of quality education. Therefore, the institute must evaluate its contribution towards a sustainable future. An environmental sustainability has become an increasingly crucial issue for the every nation; the role of higher education institutions in environmental sustainability has become more important. The rapid urbanization and economic development at the regional and global levels have led to several environmental and ecological problems. In this context, it is necessary to adopt a green campus system for the institute, which will lead to sustainable development while reducing the large amount of atmospheric carbon emissions in the environment.

Government of India through its National Environment Policy (2006) has made mandatory for every organization to have green audit / environmental audit in their organization. The process of environmental audit was formalized by Supreme Audit Institution (SAI) according to the guidelines given in Manual of Standard Orders (MSO) issued by Authority of the Controller and Auditor General of India 2002. University Grants Commission has mentioned "Green Campus, Clean Campus" mission mandatory for all higher educational institutes. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. Accordingly, realizing the need of being responsible towards environment, NAAC (National Assessment and Accreditation Council), an autonomous body under UGC has also added the concept of Environmental Audit in accreditation methodologies of State and Central Universities as well as colleges. Accordingly, Bhagwan Mahaveer Education



Society Preetam Prakash College has also initiated a Green/Environmental Audit/Energy Audit of its campus at Sector No.1, Plot No.1, Near PCMT Bus Depot.Opposite Pune Nashik Highway Indrayani Nagar Bhosari, Pune, Maharashtra.Pin - 410039

## 2. About the College

Bhagwan Mahaveer Education Society was founded in the year 2001 by our Chairman CA. Dr. Ashokkumar N. Pagariya, with the object of caring the need of higher education to the deserving and needy students of the Pune District.

It aim at quality education with moral values . The Management is not interested in making business of education but to educate moral value & prepare the students to face the challenge in future.

The Society is a minority educational institute duly approved by the State Government.We have got B.A. and B.com. Faculties duly affiliated to University of Pune in the name of PREETAM PRAKASH COLLEGE.

We are trying to start further vocational, advanced and post graduation courses which will be practically useful for students in their career.

## 3. College Vission

- Providing quality education in emerging fields to produce knowledgeable and cultured human resource, contributing to the process of national development.
- Develop life skills and soft skills among the students and provide them value education which will contribute to nation building.
- Provide them free access to ICT and also to foster global competencies among them to meet the changing challenges to keep pace with time.
- Identify geographic justification of Junnar Taluka and Pune and its strong industrial, entrepreneurial, financial and cultural establishments and traditions and develop linkages of the institution with the Public and Private Sectors.
- Pursue the quest for excellence by way of grooming the students for high profile careers.





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## 4. College Mission

- Up liftment of rural masses through appropriate education.
- To empower the socially, economically and educationally marginalized sections of the rural society of the region.
- To augment a new generation of students for contributing to the future knowledge economy.

## 6. Objectives

The main objectives of Environmental Audit in Academic Institution are:

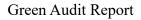
- To encourage students in general and girls in particular.
- To encourage students to learn modern techniques and methodologies.
- To develop the competencies among students to face global challenges.
- To inculcate a scientific temper and a humanitarian approach among society.
- To address global and local needs towards national development.
- To sensitize students with a sense of belongingness, integrity, and grattitudeness.

## 7. Scope and Goal of Environmental Auditing

Government of India through its National Environment Policy in 2006 has made mandatory for every organization to conduct green audit / environmental audit in order to ensure a clean and healthy environment within and outside the organization. Further, it also helps in effective learning and provides a conductive learning environment. Efforts are taking place around the world in order to address various environmental issues. Green auditing or environmental auditing is one among them for educational institutions. Green auditing helps organization to understand various environmental issues of the organization and identify existing lacuna or gap towards meeting the objective of National Environmental Policy and thus, to plan accordingly.

## 8. Methodology

An environmental audit has three phases - pre-audit stage, audit stage and post-audit stage, accordingly the environmental audit was conducted





## **Pre-Audit Stage**

Pre-audit stage involved the identification of target areas for environmental auditing. Accordingly following target areas were identified:

- Land Use System
- Biodiversity Status
- Climatic Conditions
- Air Quality
- Noise Pollution
- Water Resources and Management
- Energy Consumption
- Waste disposal and management
- Environmental Awareness
- Mitigation and Management practices

### Audit Stage

(A). Collection of data, observation and interaction: This stage of the Audit involved the activities relating to collection of data, observation, interactions and discussion with the concerned stakeholders i.e., faculty, administration and staff members from different departments and sections of the university. A mixture of open ended and closed ended questionnaires were developed and used for data collection. Meetings with specific stakeholders of different target groups identified in the pre-audit stage were conducted for getting the desired information. Detailed discussions on some specific topic were also held.

**(B). Review of previous records and policies:** This was carried out in order to understand the various initiatives taken by the university towards sustainable environmental conservation and amelioration. For the purpose, office registers, visitor's book, purchase registers, office communications, policy level documents of AC/ EC were also examined. Further, the published material such as prospectus, university annual reports, bulletins, and other magazines were also studied by the audit team for getting information / data on the target aspects.



#### (C). Inspection of departments/sections/various sites: The audit team

also visited the various departments, sections, offices and its premises in order to have an idea of various activities carried. Campus greenery and gaps were identified. Team also had a visit to play ground, canteen, library, office rooms and parking area.

**(D). The stakeholders:** The stakeholders included were teaching staff from different schools, people from administration, water supply and maintenance, electricity department and ICT. The committee set up for the purpose discussed the issues related with key target areas. Questionnaires were prepared for getting information and accordingly meeting with concerned stakeholders were conducted. Data on water and energy use was collected from maintenance department.

#### **Post-Audit Stage**

The Post-Audit Stage includes the production of the final report, prepare action plan to overcome the flaws and to keep a watch on the action plan.





## 9. Audit Report

#### (A) Land Use System

The college has adequate learning resources, including classrooms with smart classrooms, library and reading area, laboratories & computer centre with LAN, printers, scanners, good quality internet connection, sports ground, IQAC office, Examination Strong Room, seminar hall, and conference hall, RO water purifier system, safe drinking water, separate restrooms for ladies & gents, parking space, and lawns. The available infrastructural facilities are optimally utilized.



MAP- Preetam Prakash College





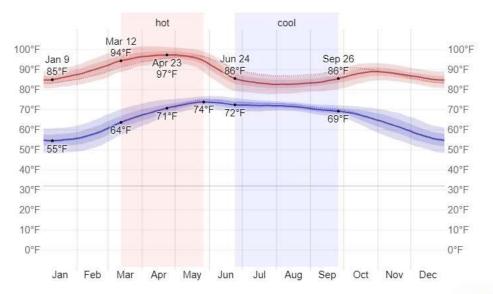
#### (B) Climatic Parameters

In Pune, the wet season is oppressive, windy, and overcast; the dry season is mostly clear; and it is hot year round. Over the course of the year, the temperature typically varies from 55°F to 97°F and is rarely below 48°F or above 102°F.

#### i) Average Temperature

The hot season lasts for 2.5 months, from March 12 to May 26, with an average daily high temperature above 94°F. The hottest month of the year in Pune is May, with an average high of 96° and low of 73°F.

The cool season lasts for 3.0 months, from June 24 to September 26, with an average daily high temperature below 86°F. The coldest month of the year in Pune is January, with an average low of 55° and high of 86°F





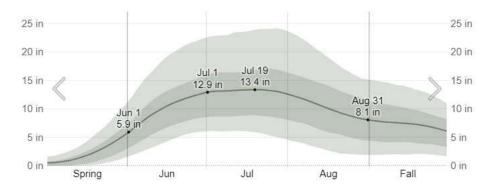


#### ii. Rainfall:

To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year. Pune experiences *extreme* seasonal variation in monthly rainfall.

The *rainy* period of the year lasts for *6.8 months*, from *May 1* to *November 25*, with a sliding 31-day rainfall of at least *0.5 inches*. The month with the most rain in Pune is *July*, with an average rainfall of *13.3 inches*.

The *rain less* period of the year lasts for *5.3 months*, from *November 25* to *May 1*. The month with the least rain in Pune is *January*, with an average rainfall of *0.1 inches*.







#### iii. Humidity:

We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

The chance that a given day will be *muggy* in Pune is *very rapidly increasing* during the summer, *rising* from 77% to 98% over the course of the season.

The highest chance of a muggy day during the summer is 99% on August 2.

For reference, on *August 1*, the *muggiest day* of the year, there are muggy conditions99% of the time, while on *January 28*, the *least muggy day* of the year, there are muggy conditions *1%* of the time.







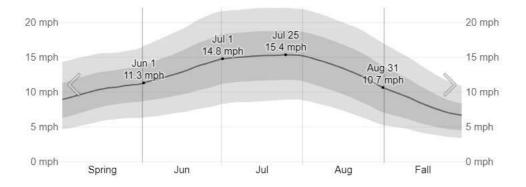
#### V. Wind:

This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages.

The average hourly wind speed in Pune is gradually decreasing during the summer, decreasing from 11.3 miles per hour to 10.7 miles per hour over the course of the season.

For reference, on July 25, the windiest day of the year, the daily average wind speed is 15.4 miles per hour, while on October 9, the calmest day of the year, the daily average wind speed is 6.3 miles per hour.

The highest daily average wind speed during the summer is 15.4 miles per hour on July 25







#### (C) Biodiversity Status

The campus of the College is located at sub tropical climatic conditions. The campus has a patch of natural forest having a major tree species like Tectona grandis, Dalbergia sissoo, Mallotus phillipinensis, Acacia catechu, Shorea robusta etc. Plantation activities are usually undertaken during rainy season and National Festivals like 15th August, World Environment Day etc. Accordingly many new species of economic and medicinal importance such as Amla, Harar, Bahera, Ashoka, Jacrenda, Neem, Ficus etc, have been introduced. Some herbs and shrubs were also planted in the campus. There are some faunal species are also found in the area. Table 2, 3, 4 and 5 shows the status of the Floral and Faunal diversity of the campus

S. No.	Botanical Name	Common Name
	TREE	I
1.	Tectona grandis,	Sagon/Teak
2.	Dalbergia sissoo,	Sheesham
3.	Mallotus phillipinensis	Rohini
4.	Acacia catechu,	Khair
5.	Shorea robusta	Sal
6.	Haldina cardifolia	Haldu
7.	Ficus bengalensis,	Pepal
8.	Terminalia chebula	Harad
9.	Terminalia bellerica,	Baheda
10.	Euclyptus spp.	Gum tree
11.	Jacaranda mimosifolia	Jacaranda
12.	Emblica officinalis	Jacaranda
13.	Emblica officinalis	Amla
14.	Azadirachta indica	Neem
15.	Saraca asoca	Ashok
16.	Aegle marmelos	Bel
17.	Ficus roxburghii	Timla
		Shrubs

#### Table 2.List of Tree/Shrubs/Herbs species found in the campus



18.	Lantana camara Kuri				
19.	Calotropis procera	Ankh			
20.	Cestrum nocturnum Rat ki rani				
21.	Murraya koenigi Kari Patta				
22.	Ricinus cummunis	nunis Arandi			
	Gra	sses/Herbs			
23. Cynodon dactylon Durba					
24.	Desmostachya bipinnata Kus				
25.	Cymbopogon martini	Lemmon Grass			



Green Cover of the College Campus.







Plants in the college campus





S. No.	Zoological Name	Common Name	
26.	Myophonus caeruleus	Blue Whistling Thrush	
27.	Passer domesticus	House Sparrow	
28.	Corvus splendens	House Crow	
29.	Pycnonotus leucogenys.	Himalayan Bulbul	
30.	Pycnonotus cafer	Red Vented Bulbul	
31.	Psilopogon asiaticus	Blue throated Barbet	
32.	Psilopogon haemacephalus	Coppersmith Barbet	
33.	Acridotheres tristis	Common Myna	
34.	Lanius schach	Long Tailed Shrike	
35.	Psittacula cyanocephala	Plum Headed Parakeet	
36.	<u>Psittacula krameri</u>	Rose Ringed Parakeet	
37.	<u>Milvus migrans</u>	Black Kite	
38.	<u>Cinnyris asiaticus</u>	Purple Sunbird	
39.	<u>Aethopygasiparaja</u>	Crimson Sunbird	
40.	<u>Cercomela fusca</u>	Brown Rock Chat	
41.	Saxicola ferreus	Grey Bush Chat	
42.	<u>Copsychus saularis</u>	Grey Bush Chat	
43.	<u>Cinnyris asiaticus</u>	Purple Sunbird	
44.	<u>Aethopygasiparaja</u>	Crimson Sunbird	
45.	<u>Cercomela fusca</u>	Brown Rock Chat	
46.	Saxicola ferreus		
47.	<u>Aquila nipalensis</u>	Steppe Eagle	

#### Table 3.List of Birds found in and around the Campus





S. No.	Zoological Name	Common Name
	Pachliopta aristolochiae	Common Rose
	Papilio polytes	Common Mormon
	Graphium doson	Common Jay
	Delias cucharis	Common Jezebel
	Catopsilia crocale	Common Emigrant
	Eurema hecabe	Common Grass Yellow
	Pieris canidia	Indian Cabbage White
	Danaus chrysippus	Plain Tiger
	Danaus genutia	Striped Tiger
	Euploea core	Common Crow
	Cupha erymanthis	Rustic
	Freyeria trochilus	Grass Jewel
	Jamides celeno	Common Cerulean
	Melanitis leda	Common Evening Brown
	Pareronia hippia	Indian Wanderer

#### Table 4. List of Butterflies found in and around the campus







Birds In the campus

#### Table 5.List of Animal found in and around the campus

S. No.	Zoological Name	Common Name
	Monitor lizard	Monitor Lizard
	Garden lizard	Garden Lizard
	Naja naja	Cobra Snake
	Bangaru caeruleus	Common Kraits
	Naja Hannah	King Cobra
	Gloydius himalayanus	Himalayan Pit Viper
	Naja naja	Himalayan Pit Viper
	Ptyas mucosus	Rat Snake

Animal in the campus





#### (D) Pollution

**i. Sources of air pollution:** It was observed and revealed from data that the only possible sources of pollution in the College campus are as use of diesel / petrol vehicles, air conditioners, power generator, kitchen waste and other biodegradable waste from canteen, use of electronic appliances and other. The campus located in very small village which is rich in greenery. Found no other source of air pollution in the campus.

**ii. Sources of noise pollution:** It was observed that there is no industrial as well as the sound generating activities near the College campus and it was revealed from that due to limited number of vehicles the chances of noise pollution seems to be quite below of standard limit. There is no other source of noise pollution in the campus.

#### (E) Water Resource and Management

The College has its own tube-well for meeting its water requirements for various purposes such as drinking, use in washrooms, canteen and gardening. Since the university does not have staff quarters at present in the College premises, thus, no household domestic water demand, water consumed in the university premises is for drinking, canteen, sanitary and gardening purposes. There is a water coolers maintained by the organization for meeting drinking water demand of the employee. The audit team did not find any leakage in the taps of washrooms and in other areas.

#### (F) Energy Consumption and Management

Electricity is mainly needed for lighting the rooms, cooling the rooms in summer and heating the rooms in winter and running computer systems. The college has a server room which needs electricity all the day and night

#### (G) Waste Disposal and Management

Both biodegradable as well as non-biodegradable wastes are generated from various departments/sections of the university. The principal waste includes paper, grasses, electronic wastes, canteen waste and other solid wastes. Since, The college operates on ODL mode therefore number of students visiting the campus are comparatively less compared to regular universities. Therefore, the waste generated through classroom activity and student's activities is negligible. Whereas, plastic wastes is completely or strictly banned in the university campus. However, following provisions have been made:

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	Waste Management Policy		
	Waste Management and proper disposal is o	ur prime responsibility.	
<ul> <li>Follow 3</li> </ul>	R's (Reduce, Reuse, Recycle) principles for	waste management.	
<ul> <li>Donate o</li> </ul>	ur old books and stationary, its better than	throwing it always and can	
help save one in need.			
<ul> <li>Switch off fans, tubs and electrical appliances when not in use, notices are pla</li> </ul>			
througho	ut the campus to avoid waste of energy.		
✤ Dust bin	s and Garbage bins have been provided at mu	altiple points for solid waste	
managen			
✤ Collect f	ees online, going paperless helps save trees.		
	environmental awareness to order to inc	rease and encourage waste	
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**i. E-Waste:** Besides the above wastes there are another category of waste is E-waste which includes computers, laptops, pen drives, printers, hard discs, CD's and other solid waste, electrical & electronics equipments generated through different department/sections is disposed and managed by the ICT, maintenance and store department of the college and the details are properly maintain in the stocks register. Thereafter in every five year the concerned departments categorize the useless items in to the wastes and disposed through auction and buyback from the authorized buyers as per the Maharashtra Government Rules.



#### (H) Environmental Awareness

The college staff is aware of the various environmental issues and the various green measures to be adopted in office as well as in their houses. A course on Environmental Studies is compulsory for all under graduate students. Further, college conducts plantation drives in the campus during Environment Day, 15 August and during other important events in the university. Further, college has also adopted nearby villages for environmental awareness activities, health camps and other community programmes being conducted through their participation.



Plantation by students & Teachers

**i. Maintenance of Lush Green Campus:** College has ten hectares of land which was transferred to it from Forest Department for the purpose of creating infrastructure required for the development of various Offices/ Departments of the college. Further felling of trees for development of various infrastructures will be done with least disturbance following government rules.

**ii. Plantation Drives:** Plantation drives are regular activities in the campus, and usually in all important occasions, plantation activity is taken up. College has maintained a garden in which different ornamental plants have been raised.

**iii. Organic Composting:** The activity of making organic compost has been initiated in the campus where all the biodegradable waste materials are filled up in the compost pit. In the course of time, organic compost is prepared. This organic compost is utilized for manuring in flowerbeds and plantations

#### iv. Energy Conservation efforts:

The college is using star rated Electrical & Electronics equipment which saves energy. LED Bulbs/ Tube-light, 4-5 star Rated Air Conditioners. College has always been effortful in making use of renewable energy resources. The average electricity consumption of the University per month is approximately 12940.38units. For the purpose, College has already installed a grid





connected solar power plant of 120 Kw. It is expected that College will produce approximately 400 to 500 units of electricity per day which will be equivalent to 80 % of energy consumption of the University. This is the step forward for energy conservation and will definitely reduce the electricity consumption of the college and save the money for college.

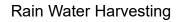
#### v. Water Conservation Measures through Water Harvesting Tank

Globally, our water resources are depleting each year. Additionally, we cannot generate artificial water and must depend on water sources available on our planet earth. In this context, to reduce dependency of water from tube-well and also to recharge underground water resources, the college adopted one of the simplest and best measures for conserving water. The university had created a water harvesting tank in the back side of the campus. It is a simple strategy by which rainfall is stored for future usage. The process involves collection and storage of rainwater with help of artificially designed systems, that runs off natural or man-made catchment areas e.g. rooftop, compounds, rocky surface, artificially repaired impervious/semiprecious land surface. The collected rainwater from surfaces on which rain falls may be filtered, stored and utilized in different ways or directly used for recharge purposes. The use of a rainwater harvesting system provides excellent merits. This simple water conservation method





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## **10. Recommendations**

A green audit of any academic institution reveals, ways by which institute can reduce energy consumption, water use and reduction in emission of carbon dioxide in the environment. It is a process to look into and ask ourselves whether we are also contributing to the degradation of the environment and if so, in what manner and how we can minimize this contribution and bring down to zero and preserve our environment for future generation. This process of green audit enables us to assess our life style, action and assess its impact on the environment. Green auditing is the process of identifying and determining whether institutional practices are ecofriendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources, viz., energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our activities are consuming more than required resources? Whether we are handling waste carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one.



As an outcome efforts will be made to reduce carbon foot prints by using electrical vehicles in the campus, and green computing in the administration and examination.

Focus to assess the consumption of energy, electricity, water as well as disposal of liquid waste, solid waste, hazardous waste, e-waste and an inventory of trees in the campus is also prepared to check how much CO2 is sequestered and O2 is released.

- The College will follow No Vehicle Day on first Saturday of every month to saved fuel consumption.
- Various awareness programmes will be helpful to motivate all the staff members for optimized sustainable use of available resources.
- The long term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue.
- To prepare an Environmental Statement Report on green practices followed by different departments, support services and administration.
- The Green Audit Report on environment must reach the public so that it would succeed in reducing the environmental issues and its popularization among stakeholders.
- If possible an environmental audit report must be published annually by the college.
- Government can play significant role for environmental legislation and quality adoption of cleaner and environmentally begin technologies in Government organizations like Universities.

## 11. References

NEP (2006). National Environment Policy, 2006. Ministry of Environment, Forest and Climate Change, Govt.



AARCHIT VENTURE