

Maratha Vidya Prasarak Samaj's KRT Arts, BH Commerce and AM Science (KTHM) College, Nashik, (MS), India Department of Environmental Science

(Reg. No. ID No. PU/NS/ASC/012(1969))

certificate Green Campus Audít

This is to certify that the Department of Environmental Science conducted "GREEN AUDIT" for Maratha Vidya Prasarak Samaj"s GURUVARYA Mamasaheb Dandekar Arts, Bhagwantrao Waje Commerce and Science College, Sinnar, Dist: Nashik, M.S., India for the year 2021-22. The audit focused on assessment of the green initiatives, planning and implementation of the college campus that consisted of "Green Campus Management, Plantation, Waste Management, Water and Waste Water Generation, Rainwater harvesting and Conservation of Energy, etc.". We appreciate the efforts of the college and issue the certificate of Green Audit for the year 2021-22.

Place : Nashik Date : 30th NOV 2022

Dr. P. M. Nalawade Lead Auditor ISO 14001:2015 (Certification No. IN/14019/144609)

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GREEN AUDIT TEAM

ENVIRONMENT MANAGEMENT SYSTEM AUDIT TEAM, KRT ARTS, BH COMMERCE AND AM SCIENCE COLLEGE, NASHIK – 02 Email: arc@kthmcollege.ac.in

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Sr. No.	Name of Member	Designation	Title in Committee
1	Dr. D.M. Jadhav	Associate Professor	Coordinator
2	Mr. A.V. More	Assistant Professor	Member
3	Mr. V.S. Varape	Assistant Professor	Member
4	Mrs. Sapana Bhamare	Assistant Professor	Member

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1. INTRODUCTION

1.1. About Parent Institution

The Maratha Vidya Prasarak Samaj is one of the most prestigious centers of learning in the State of Maharashtra.It manages 477 educational institutes and it is one of the premier organizations in the jurisdiction of Savitribai Phule Pune University. At present total strength of student is around 2,00,000. The credit for the birth of M. V. P. Samaj goes to the young, enthusiastic and devoted team of social workers and educationists, Karmaveer Raosaheb Thorat, Bhausaheb Hire, Kakasaheb Wagh, Annasaheb Murkute & Ganpat Dada More who laid the foundation of the Samaj. Adv. B. G. Thakare, Adv.Vitthalrao Hande & Dr. Vasantrao Pawar are major contributor of Samaj. They were the devotees who envisioned a culture and knowledge centric society. The motto of the Samaj is "Bahujan Hitay Bahujan Sukhay", for the wellbeing and happiness of the masses to kindle the social cause.

1.2. About College

Guruwarya Mamasaheb Dandekar Arts, Bhagwantrao Waje Commerce and Science College, Sinnar was established in June 1969. It is NAAC reaccredited 'A' grade college having four faculties' Arts, Commerce and Science and Computer Science. College offers undergraduate and post graduate and even doctorate programmes for the students of the area and considered as the premier center of learning in the Sinnar region. College is affiliated to Savitribai Phule Pune University, Pune. College is awarded as the Best College Award (Rural) from the University. College occupied 14.5 Acres of land on which main College building, Library, MCVC building, Gymkhana, and wide playground etc. are available. The gymkhana of the College is well equipped and highly self-sufficient for indoor and outdoor games for the College students. The College is imparting quality education in 17 undergraduate, 10 postgraduate and one research Centre. Also, it is recognized learning center of Yashvantrao Chavan Open University which provides distance education to needy people of the region. The College has well equipped laboratories. College has well facilitated girl's hostel in the campus with the intake capacity of 90 girl students. College also has staff quarters which provides residence to the teaching and nonteaching staff of the College. Entire college is covered under CCTV surveillance. College has well developed and rich resource library possesses books, periodicals, newspapers and other facilities for teachers and students. The college has adopted 'Green Campus and Clean campus' motto for environmental conservation and sustainability. College has a ecosystem pond in which many phytoplanktons and zooplanktons along with other hydrophytes have been conserved.

1.3 Highlighting Features

- ➢ Grant-in-Aid Co-Education College.
- > Affiliated to Savitribai Phule Pune University, Pune.
- Certified 2F and 12 B enabling UGC assistance.
- > Situated in Rural Area.
- ➤ Campus of 14.5 acres.
- ➢ Significant girl students.
- Reaccredited previously 'A' grade
- Best College Awardee from SPPU



MAP OF COLLEGE CAMPUS

1.4. Environmental Conservartion Committee

Sr. No.	Name of Member	Designation	Title in Committee
1	Prin. Dr. P. V. Rasal	Principal	Chairman
2.	Dr. D. M. Jadhav	Associate Professor	Coordinator
3	Mr. S.T. Pekhale	Associate Professor	Member

 Table 1. Environmental Conservation Committee

1.5 Functions of Environmental Conservation Committee

The College has established an Environmental Cell to educate students and teachers about environmental issues and challenges, as well as to motivate them to spread information and educate school children and the general public about these issues.

- To raise awareness among student and teachers about the Institute and environmental issues.
- To implant a sense of responsibility for the development of planet Earth, as well as for its beauty, by giving chances to gain knowledge, skills, attitudes, and dedication to environmental preservation.
- To teach students about the interconnectedness of economic, social, and environmental concerns.
- To prepare students and teachers about environmental education.
- To improve the college campus's environment aesthetically.
- To raise awareness of the importance of environmental preservation among students and society.
- To handle the College's solid trash, liquid waste, and e-waste.

1.6 Objectives of study

The major goal green audit is to encourage environmental management and conservation in the college campus. It also aims to identify, measure, explain, and prioritize a framework for environmental sustainability that adheres to all applicable legislation, policies, and standards. The following are the major goals of a Green Audit:

• To introduce and make students aware of real concerns of environment and its

sustainability.

- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections require high cost.
- To bring out a status report on environmental compliance.

1.7. Methodology

The approach for doing a green audit comprised several instruments such as questionnaire development, physical inspection of the campus, observation and study of paperwork, interviewing key people, data analysis, measurements, and suggestions.

1.8. Steps in Green Audit

Pre-Audit

- 1. Make a plan for the audit.
- 2. Form an auditing team
- 3. Schedule for an audit.
- 4. Gather the necessary background information.
- 5. On Site Visit
- **4** On Site
 - 1. Understand the scope of audit
 - 2. Analyze the strengths and weaknesses of the internal controls
 - 3. Conduct the audit
 - 4. Evaluate the observations of audit program
 - 5. Prepare a report of the observations side by side
- Fost-Audit
 - 1. Produce a draft report of the data collected
 - 2. Produce a final report of the observations and the inference with accuracy
 - 3. Distribute the final report to the management
 - 4. Prepare an action plan to overcome the defects
 - 5. Keep a watch on the action plan

1.9. Scope of Work

The following Environmental Issues were studied for the above-mentioned campus

Area.

• Water Environment including rain water harvesting potential of the campus.

- Plant diversity.
- Noise Environment.
- Solid Waste Management Practices.
- Air Environment.

This study has been created based on the available data, samples, and information supplied by the G.M.D. Arts and B.W. Commerce and Science College, Sinnar and recommendations for improving the campus environment have been made by college officials.

1.10. Courses Offered

	1 au	ie-2. Course Offereu	
Sr. No.	Name of Faculty	Name of Program	Name of Subject
1			English
2			Marathi
3			Defense and Strategic studies
4		BA	Economics
5			Geography
6	T 1 3 1		History
7	Faculty of Arts		Political Science
8			Marathi
9			English
10			Defense and Strategic studies
11		M.A.	Economics
12			Geography
13			Political Science
13			Banking
14		DC	Business Administration
15		B.Com	Business Economics
16			Business Entrpreneurship
	Ecoulty of Commerce		Marketing
17	Faculty of Commerce	M.Com	Business Administration
18			Advanced Accounting
10			Taxation
19		BSc	Botany
20		2.50	Chemistry
21			Electronics
22			Mathematics
23	Faculty of Science		Physics
24			Zoology
25			Computer Science
26			Microbiology
27			Chemistry
28		M. Sc.	Physics
29			Zoology
30		Research Centre	Chemistry
31	Interdisciplinary	Interdisciplinary	Library
32	interenserprinary		Physical Education

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Table-2. Course Offered



1.11. Total Population of Campus

Table-3. Total Population of Campus (2021-22)

Sr.No.	Particulars	Total number
1	College Staff (Teaching & Non-Teaching)	139
2	College Students (Girls and Boys)	3229
	Total	3368
3	Residential Students	11
4	Residential Staff	20
	Total	31

2. WATER AUDIT



Water benefits biodiversity, agriculture, the human population, and the economy. Water scarcity and security are becoming increasingly important issues as a result of recent events in India and around the world. In recent years, Maharashtra has also been severely affected by water scarcity. As a result, water management has been included as a critical component of achieving sustainable development in the Sustainable Development Goals (SDGs).

Unprecedented strains on natural resources, particularly water, have resulted from unplanned urban growth, Industrial and economic development. The growing demand for water in places like Sinnar that have high amount of dissolved solids and hardness in underground water underscores the significance of total water management. According to the National Water Mission standards, metro cities should have a water supply of 150 lpcd, smaller cities/towns with sewage systems should have 135 lpcd, and cities/towns without sewage systems should have 70 lpcd.

Rainfall

The average rainfall at this location varies between 0.7 mm in the driest month (February) and 103.2 mm in the wettest month (September). The total annual rainfall in an average year is 453 mm.



2.1 Calculation of Water Requirement:

In the investigation, one well which is about 500 meter away from the college campus was identified as important source of water. The well bears water throughout the year and fulfills need of water for toilets, laboratories and gardening. Drinking water in the hostels and college premises were obtained through the water connection from Sinnar Municipal council. Well water is used in the canteen, bathrooms, laboratories, hostels, staff quarters and on the grounds. There were no leaks or overflows of water from above tanks throughout the survey, thus there was no water loss. A small artificial pond is also providing some water for trees planted in the college campus. In monsoon water from main building and hostel building is released in the pond as a part of rain water harvesting. Pond is also becomes home for many phytoplanktons, zooplanktons, fishes and various hydrophytes.

The following water sources was identified in the college campus:

- 1. Well 500 meters away from college campus.
- 2. Pond in the College campus

Sr. No.	Source of water	Number of times the water is	Average quantity of
		upilited from the source	water upinted. (Lit)
1	Well 500 meters away	2 times a day (total 5 hrs)	40000
	from college campus		
2	Pond in the College	1 time a day (total 5 hrs)	30000
	campus		
		Total Water uplifted in t	he campus: 70,000

Table 4. Source of water

Major Water Source in the College Campus



Well as a water resource

Pond in College campus

Sr. No.	Particulars	Total population	Required Water Supply (liter per person per day)	Water Requirement (liter per day)
1	College Staff (Teaching and Non-Teaching	139	20	2,780
2	College Students (Girls and Boys)	3229	20	64,580
3	Residential Students	11	45	495
4	Residential Staff	20	45	900
5	Floating Population (Visitors)	25	20	500
Total		5498	-	69,255

Table 5 Total Average requirement of water in campus

The data gathered from all departments is double-checked and verified. The college uses 69,255 L/day on average, with 2,780 L/day for staff and 64,580 L/day for students. While the residential staff uses total 900 L water per day. Residential students use 495 L/day. That means the water demand for whole year is 2,52,78,075 Liters.

2.2 Waste Water Management:

Water usage can be described as the amount of water consumed on campus for all activities from various water sources. This applies to all residences, academic buildings, oncampus, and on-grounds usage. Water that is moved off campus is referred to as wastewater. Based on data on water usage and the fact that around 80% of the water supplied is converted to waste water via washrooms, chemical laboratories, and other means, the campus created approximately 56,000 liters of waste water every day.

As was revealed, there is no separate drainage system for collecting and transferring sewage and liquids from laboratories. There is currently a combined drainage system in place that carries all liquid effluent to a sewage system. It is necessary to collect grey and black water. After minimal treatment, grey water must be used for plant irrigation, and black water must be effectively treated with a simple septic system and soak pits.





Drainage system of Chemistry department

Sewer for wastewater from toilet at Main building



Septic tank near toilet of main building

2.3 Quality of Water in the Campus:

The water of well and pond is used for all purposes except drinking. The water is used to flush toilets, water gardens, hostels and laboratories. Water provided by Municipal council is used for the purpose of drinking. Four Water purifiers are installed in various places in the college campus. The water is treated with a purification system before being made available for drinking. Water coolers are also placed at various places in the College campus. It is assured to provide clean and fresh water to hostel, staff quarters, library and to the main building. Frequently, hardness of water is checked for the assessment of water quality.

Sr. No.	TESTS	Pond Water Sample	Well Water Sample
1.	Description	A clear, colourless, and odourless	A clear, colourless, liq. odourless
2.	рН	5.6 at 25 [°] C	5.7 at 25 [°] C
3.	Conductivity	4.9 μ S cm ⁻¹ at 25 ⁰ C	$3.5 \ \mu S \ cm^{-1} \ at \ 25^0 \ C$
4.	Acidity or alkalinity	455 mg/ L	410 mg/ L
5.	Total Dissolved Solids	3782. mg/L	2100 mg/ L
6.	Calcium and Magnesium	140 mg/L	100 mg/ L
7.	Chloride	411 mg/ L	320 mg/ L
8.	Total Hardness	862 mg/ L	530 mg/ L
9.	E. Coli	Absent	Absent

Table. 6. Water Quality assessment Results of both water sources



1. Water Cooler in Girls Hostel



2. Water cooler system near Library



3. Water Purifier System in College campus



4. Drinking water source for students

2.4 Rainwater Harvesting Potential:

There are four adjacent buildings possesses large terrace areas and paved surface. All of the buildings had Rain Water Harvesting (RWH) System implementation. But as construction is in progress, RWH are not in working. But, after completion of construction work RWH will be reinstalled. The harvested water is released in the pond available in the college campus. The water harvested in the pond is utilized for the purpose of gardening in the college campus.





Rain Water Harvesting Installation unit (Work in progress)

2.5 Waste Quantification and Management:

This indicator considers the creation and disposal of a variety of wastes, including paper, food, plastic, biodegradables, construction, glass, dust, and other materials, as well as recycling. Furthermore, solid waste often contains wasted material resources that may be better utilized through recycling, repair, and reuse. Solid waste generation and management is a hot problem. Solid waste management that isn't based on science can put everyone in danger. The survey sought information on the volume, kind, and current management of solid waste generated on campus. Various solid wastes were collected, as previously stated.

3. SOLID WASTE AUDIT

Solid waste generation and management has been a major issue in recent years. The rate of solid waste generation is extremely significant, but we lack adequate technologies to manage the garbage generated. All non-liquid garbage is classified as solid waste. If solid trashis not properly disposed of, it can cause serious health problems as well as an unpleasant living environment. As a result, it is critical to properly manage solid waste in order to lessen the pressure on waste management systems. The goal of this inventory is to determine the amount, volume, type, and present management practice of solid waste generated on G.M.D. Arts, B.W. Commerce and Science College campus. This study will aid in the continued management of solid waste and the construction of a green campus.

3.1 Generation of Solid Waste:

Category wise solid waste generation (kg / month)

Category of	Paper	Plastic	Biodegradable	Construction	Glass	Total solid
waste	waste		le waste	waste	waste	waste
Quantity	675 kg	250 kg	900 kg	500 kg	25 kg	2250 kg

Table 7.	Category	wise solid	waste	generation	(kg	/month
1 4010 / .	Category	mbe bome	maste	Semeration	1.5	monun

Throughout the study period 2850.00 kg of solid waste was generated. On the basis of obtained results in which highest quantity of solid waste is Biodegradable-waste and is about 900.0 kg/month. Paper waste is at second place amounting 675.00 kg/month and Construction waste is 500.0 kg/month as there is construction in progress.

Sr.	Specification	Segregated	Recycled	Reuse	Other
No.	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(specify)
1.	Paper	Y	Y	Ν	NA
2.	Cardboard	Y	Y	N	NA
3.	Plastic	Y	Ν	Ν	NA
4.	Food waste	Y	Y	Y	NA
5.	E Waste	Y	Y	Ν	NA
6.	Hazardous waste	Y	Y	N	NA
7.	Glass	Y	Ν	Ν	NA
8.	Laboratory Rags	Y	N	N	NA
9.	Metals	Y	Y	N	NA
10.	Plant waste	Y	Y	Y	NA

 Table 8. Segregation of solid waste

3.2 MANURE PREPARATION:

Manure is prepared form plant litter of the college campus. This manure is used for plants of college garden. Manure is a key ingredient in organic farming. At the simplest level, the process of composting simply requires making a heap of wet organic matter and waiting for the materials to break down into humus after a period of three months. Manure is rich in nutrients. The manure itself is beneficial for the land in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, and as a natural pesticide for soil.

In ecosystem, manure is useful for erosion control, land and stream reclamation, wetland construction, and as landfill cover. The decomposition process is done by shredding the plant matter, adding water, and ensuring proper aeration by regularly turning the mixture. Worms and fungi further break up the material. Aerobic bacteria manage the chemical process by converting the inputs into heat, carbon dioxide and ammonium. The ammonium is further converted by bacteria into plant-nourishing nitrites and nitrates through the process of nitrification

VERMICOMPOSTING

College has made the manure and used for plant situated around college. The institution has implemented vermiculture composting unit of size 25 x 25 feet consists of 10 beds with plant capacity of 1000 Kg. The major goal is to limit the amount of disposable garbage on campus. The species used for Vermicompostingis *Eisenia foetida*. It is utilized as manure in the garden and lawns when the vermicompostingprocess is completed.



Vermicompost unit in College Campus

4. HAZARDOUS WASTE AUDIT

4.1 Chemical waste:

A hazardous waste is a solid, liquid, or gaseous item with a "Hazardous Characteristic" or that is officially "designated" as a hazardous waste by name. Despite the fact that characteristic wastes are not specified by their chemical name, they are controlled as hazardous wastes because they exhibit one or more harmful features. Ignitability, Corrosivity, Reactivity, and Toxicity are the four traits.

Various compounds created in science departments' laboratories are classified as hazardous waste. It exists as a liquid as well as a solid state. Because only a small portion of the population generates hazardous waste, only roughly 5 departments have been included.

4.2 Hazardous Waste Generated at departments

Chemistry Department generated maximum amount of chemical and hazardous solid waste from laboratories and other sources. Very negligible hazardous waste is generated by other science departments. Arts and Commerce faculty departments are free of hazardous waste.

5. E-WASTE

E-waste generation is evident in every educational institution. Particularly at the college level, there are less equipment and instruments in use for administrative and scientific purposes. In administrative work, computers, printers, and Xerox machines are required. The wire necessary for connecting is likewise thrown away with the e trash. Similarly, numerous scientific instruments and equipment from science laboratories deteriorate over time. These, too, contribute to the e-waste problem.

Sr. No	Department	E-waste (kg/year)	E-waste treated and disposed (kg/year)
1	Office	5	5
2	B.Sc. (entire Computer Science)	3	3
3	Chemistry Department	2	2
4	Physics	10	10
Total		20	20

Table-9. Number of not working electrical equipment's

Major source of e-waste generation is the Science Departments of the College. Department of Physics generated highest amount of e-waste i.e. 10 kg as compared to other Science Departments. It is followed by Office which generated 5 kgs of e- waste. Chemistry Department generated about 2 kg. The E-waste and malfunctioning items from the computer lab are appropriately kept. In order to dispose of E-waste in a scientific way, the parent institution Maratha Vidya Prasarak Samaj, Nashik has opted to contact an approved E-waste management and disposal facilities unit.

The audit team observed that the technical life time / service life of most electronic instruments has not yet expired, resulting in little waste creation. However, the College must device a long-term and consistent e-waste disposal strategy.

6. ENVIRONMENTAL QUALITY AUDIT

6.1 Air Quality Audit

Air pollution has also become a critical issue in India. Most of the urban conglomerations in India are highly polluted with recent case of Delhi air pollution. In 2014, the World Health Organization (WHO) had assessed 1,622 cities worldwide for $PM_{2.5}$ and found that 13 of the 20 cities in India that WHO assessed are with the most polluted air.

The air pollution is mainly caused by vehicle emissions, fuel, industrial activities, and coal fired power plants. The WHO further suggests that most Indians breathe unsafe air. Air pollution causes asthma, which is now soaring, even amongst the children. PM_{2.5} contributes to cancer, and it kills by triggering heart attacks and strokes.

Air quality in the academic institute is very important for health of the students, faculty, and staff of the institute. The air pollution sources in the college campus are windstorm, pollen grains, natural dust, vehicular emissions, generators, fires and laboratory fumes etc. The air pollutants monitored on regular basis are Sulphur dioxide (SO₂), Oxides of Nitrogen as NO₂, Suspended Particulate Matter (SPM) and Repairable Suspended Particulate Matter (RSPM) etc.

The health of the students, instructors, and staff at the academic institute is dependent on the air quality. Windstorms, pollen grains, natural dust, traffic emissions, generators, fires, and laboratory smells, among other things, are all causes of air pollution on the college campus. But in the present study whole city is considered and the data is extracted from nearby government air quality monitoring stations.

6.2 CAUSES OF AIR POLLUTION IN SINNAR

(i) Sinnar is an Industrial area which is surrounded by hundreds of small- and large-scale industries. Machine operations in these industries releases various toxic gases in the air which mainly cause air pollution in the city.

(ii) The other causes of outdoor air pollution are solid, liquid particles called aerosols & gas from vehicles emissions, construction activities, factories, burning stubble & fossil fuels and wildfire, etc.

(iii)Main causes of indoor air pollution are harmful gases from cooking fuels (such as wood, crop wastes, charcoal, coal and dung), damp, smoke, chemicals from cleaning materials,etc.

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6.3 Noise Quality Audit:

One of India's most critical environmental issues is noise pollution, although most of us are unaware of the harm it brings. We are all exposed to loud noises for lengthy periods of time in India, both on a daily basis and during festival seasons such as Ganesh Festival, Diwali, and others throughout the year. Uninvited noises like horns, other traffic noise, loudspeakers, and, of course, residential noise like television and music system sounds are inevitable on a daily basis. There is a common idea in our country that happiness can only be shown by making loud noises.

Being located on the highway, the faces regular noise problem in the forms of Unwarranted sounds such as honking, other vehicular noise; the loudspeakers on daily basis are inevitable. In our country it's a major perception that happiness can only be expressed by creating loud noises. The following table shows implications of Noise on Human Body.

Exposure to high levels of noise may cause permanent hearing loss. The repeated exposures to loud noise can lead to permanent tinnitus and/or hearing loss. Furthermore, it may create physical and psychological stress, reduce productivity, and interfere with communication and concentration. The effects of noise induced hearing loss can be profound & can be limiting your ability to hear high frequency sounds, understand speech, and seriously impairing your ability to communicate.

Sr. No.	Location	Minimum	Maximum	Average
1	Play Ground	67	90	80
2	Staff Quarters	60	72	69
3	Canteen	66	88	78
4	1 st Floor Porch	63	83	71
6	Garden Area	48	88	67
7	Main gate	68	87	66
8	Girl's hostel	65	75	68
9	Administrative	60	70	64
	Office			

 Table 10-Noise Level of the Campus

*Note: Ambient Air Quality Standards in respect of Noise dB (A), in accordance with Noise Pollution Regulation and Control) amendment rules, 2000 Silent Zone

The institution has explored a variety of methods to eliminate sound pollution on campus or to avoid producing noise. The campus has been designated as a Silent Zone, and pupils have been educated using silent zone signs. Students have been instructed to use their cellphones in silent mode, particularly in the library and theatre. So that sound pollution is decreased, suggestion boards for no honking have been placed across the campus. The majority of trees have been planted on the college campus to minimize the intensity of noise pollution; thus, sound pollution levels will be lower in the future.

SOUND (NOISE) POLLUTION MANAGMENT:

To avoid sound pollution in the college campus, or to avoid causing noise, the college has tried various means to prevent sound pollution.

a. Silent Zone:

The campus has been declared as Silent Zone and the students have been instructed with the help of boards of silence zone.

b. Use of Mobile phone in Silent Mode: An instruction has been given to students and teachers to operate mobile phones in silent mode, especially at the library and auditorium hall.







7. GREEN COVER OF THE COLLEGE CAMPUS

As we face increasing climate and environmental issues, green campuses are becoming increasingly important. Through both practical reforms and the teaching they give, larger institutions have the ability to positively contribute to the climate change movement. A green area is defined as any place with grass, trees, or horticulture. Tree canopy analysis is a good way to estimate how much green cover there is in a given area. Canopy cover is the covering created by the branches and crowns of plants or trees (green cover). Green cover refers to the percentage of a given area of the ground that is covered by tree crowns. According to earlier national forest policy and the National Mission for Green India (GIM), one of eight missions under the National Action Plan on Climate Change (NAPCC), 33 percent of total accessible land should be covered by vegetation. Because plants and trees are the best carbon sinks, it will aid in the decrease of greenhouse gas emissions. Green cover of the college campus is calculated by using following formula

$$Green Cover (\%) = \frac{Total Green Cover in sq.meter}{Total area of campus in sq.meter} x 100$$

Sr.No.	Total Area of Campus (sq. meter)	Total Green Cover (sq. meter)	Percent Green Cover
1.	58680	28328	48.27

Table 11 Green Cover Calculations

The college campus has a total size of 58680 square metres, according to information acquired during the site visit. The tree canopy cover is predicted to be 28328 square metres, which comprises about 48.27 percent of the total open space. Total green cover in the GMD College campus is far better than the prescribed levels.







Green Area of College Campus

Trees are not only important, but they are also essential for survival. They produce oxygen, filter CO₂, prevent soil erosion, and maintain ecological equilibrium, among other things. They also give us with food, housing, and a variety of other necessities. The tree selection is critical while plating trees on campus. Increased canopy coverage from trees helpsto reduce the urban heat island effect. Pedestrians will benefit from the shade provided by trees, which will provide relief from the heat. They will also provide shade to surrounding buildings, decreasing the need for air conditioning.



Flower Diversity in College campus

7.1. List of available plants on college campus

Table12. List of available trees on college campus

Sr.	Botanical Name	Common/ Local	Family	No. of
No.		Name		individuals
1	Acacia Auriculiformis	Australia Babhul	Mimosaceae	42
2	Acacia catechu	Khair	Mimosaceae	01
3	Acacia nilotica	Babhul	Mimosaceae	02
4	Acalypha wilkesiana (various)	Copper leaf	Euphorbiaceae	40
5	Aegle marmelos	Bel	Rutaceae	01
6	Aglonema crispum (Pot plant)	Aglonema	Araceae	01
7	Albizia lebback	Shiris	Mimosaceae	14
8	Aloe barbadensis	Korphad	Liliaceae	10
9	Alstonia scholaris	Satvin	Bignoniaceae	08
10	Annona squamosa	Sitaphal	Annonaceae	04
11	Araucaria cookii	Chrismas tree	Auracariaceae	02
12	Archontophenix purpurea	Palm	Arecaceae	13
13	Artocarpus heterophyllus	Jackfruit (Fanas)	Moraceae	04
14	Azadirachta indica	Kaduneem	Meliaceae	22
15	Bambusa Vulgaris	Bamboo	Poaceae	90
16	Bauhinia racemosa	Apta	Caesalpiniaceae	02
17	Bauhinia variegata	Raktchandan	Caesalpiniaceae	17
18	Bombax ceiba	Katesawar	Bombacaceae	02
20	Bougainvillea spectabilis	Boganvel	Nyctaginaceae	06
21	Bryophyllum pinnatum	Panphuti	Crassulaceae	01
22	Butea monosperma	Palas	Fabaceae	01
23	Caesalipinia pulcherrima	Shankhasur	Caesalpiniaceae	182
25	Callindra emerginata	Powderpuff	Mimosaceae	03
26	Callistemon acuminatus	Bottle brush	Myrtaceae	10
27	Calotropis gigantia	Akand rui	Asclepiadaceae	03
28	Calotropis procera	Rui	Asclepiadaceae	02
29	Canna indica	Kardal	Cannaceae	02
30	Cassia fistula	Bahava	Caesalapiniaceae	01
31	Cassia siamia	Tarawat	Caesalpiniaceae	25
32	Casuarina equisetifolia	Suru	Casuarinaceae	05
33	Chlorophytum comosum	Chlorophytum	Asparagaceae	01
34	Clitoria ternatea	Gokharn	Pappilionaceae	05
35	Cocos nucifera	Naral	Arecaceae	28
36	Coleus blumei	Coleus	Lamiaceae	06
37	Crinum asiaticum	Spider lily	Amarallydiceae	25
38	Cycus revoluta	Cycas	Cycadaceae	02
39	Delbergia sisso	Shisam	Papillionaceae	27
40	Delonix regia	Gulmohar	Caesalpiniaceae	60
41	Dodonaea viscosa	Badh	Sapindaceae	-
42	Dracaena mahatma	Dracaena	Asparagaceae	01
43	Dracaena marginata 'Tricolor'	Dracaena	Asparagaceae	01
44	Dracaena reflexa	Song of India	Asparagaceae	01
45	Duranta repens	Golden duranta	Verbenaceae	105

46	Dypsis lutescens	Areca palm	Arecaceae	06
47	Eucalyptus globulus	Nilgiri	Myrtaceae	15
48	Ficus benghalensis	Wad	Moraceae	15
49	Ficus benjamina	Ficus	Moraceae	06
50	Ficus elastica	Rubber tree	Moraceae	01
51	Ficus glomerata	Audumbar	Moraceae	12
52	Ficus religiosa	Pipal	Moraceae	14
53	Gliricidia muculata	Giripushpa	Papillionaceae	32
54	Gmelina arborea	Shivan	Verbenaceae	05
56	Grevillia robusta	Silver Oak	Proteaceae	04
57	Hamelia patens	Fire bush	Rubiaceae	40
58	Hibiscus rosa-sinensis	Jaswand	Malvaceae	05
59	Hyophorbe lagenicaulis	Bottle palm	Arecaceae	08
60	Ixora coccinia	Ixora	Rubiaceae	05
61	Jasminum sambac	Mogra	Oleaceae	03
62	Juniperus chinensis	Juniper	Cupressaceae	02
63	Lantana camara	Lantana	Verbenaceae	05
64	Leucaena leucocephala	Subabhul	Mimosaceae	26
65	Livistona chinensis	Fan palm	Palmae	01
66	Magnolia champaca	Sonchafa	Magnoliaceae	03
67	Mangifera indica	Mango	Anacardiaceae	72
68	Manilkara zapota	Chiku	Sapotaceae	01
69	Melia azadirach	Bakam	Meliaceae	07
70	Millingtonia hortensis	Kawal Nimb	Bignoniaceae	06
71	Mimusops elengi	Bakul	Sapotaceae	02
72	Moringa oleifera	Shevaga	Morngaceae	04
73	Morus alba	Tuti	Moraceae	02
74	Murraya koinigii	Kadipatta	Rutaceae	02
75	Nephrolepis biserrata	Fern	Nephrolepidaceae	01
76	Nerium indicum	Kanher	Apocynaceae	01
77	Ocimum bacillicum	Sabja	Lamiaceae	02
78	Ocimum gratissimum	Clove basil	Lamiaceae	02
79	Ocimum sanctum	Tulsi	Lamiaceae	10
80	Opuntia elatier	Nivdung	Cactaceae	01
81	Peltoforum pterocarpum	Pivli Gulmohar	Fabaceae	10
82	Phoenix sylvestris	Sindhi	Arecaceae	02
83	Phyllanthus emblica	Awla	Euphorbiaceae	06
84	Pithecellobium dulce	Wilayti chinch	Leguminoceae	12
85	Plumeria alba	chata	Apocynaceae	05
86	Plumeria pudica	Chafa	Apocynaceae	02
87	Polyalthia longifolia	Ashok	Annonaceae	30
88	Pongamia pinnata	Karanj	Papillionaceae	14
89	Prosopis cineraria	Shamı tree	Mimosaceae	01
90	Psidium guavajava	Peru	Myrtaceae	04
91	Putranjiva roxburghii	Putrajivi	Euphorbiaceae	01
92	Kosa demascena	Gulab	Rosaceae	06
93	Santalum album	Chandan	Santalaceae	12
94	Saraca indica	Sitaashok	Fabaceae	01

95	Sensvieria trifasciata	Snake plant	Asparagaceae	04
97	Spathodea campanulata	Spathodea	Bignonaceae	02
98	Swietenia macrophylla	Mahogani	Meliaceae	01
99	Syzygium cumini	Jamun	Myrataceae	18
100	Tabernaemontana coronaria	Chandani	Apocynaceae	40
101	Tamarindus indica	Chinch	Caesalpiniaceae	20
102	Tecoma stans	Tecoma	Bignoniaceae	40
103	Terminalia bellerica	Behda	Combretaceae	01
104	Terminalia catappa	Indian Almond	Combretaceae	38
105	Terminalia chebula	Hirda	Combretaceae	04
106	Terminalia arjuna	Arjun	Combretaceae	01
107	Thevetia peruviana	Pivli kanher	Apocynaceae	150
108	Thuja occidentalis	Morpankhi	Cupressaceae	23
109	Vitex negundo	Nirgudi	Verbenaceae	01
110	Ziziphus jujuba	Ber	Rhamnaceae	07
	,	Fotal		1555

SPECIAL GARDENS DEVELOPED IN COLLEGE CAMPUS

Department of Botany developed four special plant gardens on the basis of Vedic Science guidelines.

- 1. Rashi van
- 2. Nakshatra van
- 3. Sarasvati van
- 4. Vrunda van
- 1. **Rashi Van-** On the basis of Zodiac signs of a person, there is a specific tree is connected with each zodiac sign. In this specific garden all those tresses have been planted. The trees planted in this garden as per zodiac sign are.

Table 13.-List of Plants in Rashi Garden

Sr.	Name of plant	Zodiac Sign
No.		
1	Artocarpus heterophyllus	Gemini
2	Butea Monosperma	Cancer
3	Acacia catechu	Scorpio
4	Mimusops elengi	Libra
5	Alstonia scholaris	Taurus
6	Mangifera indica	Virgo
7	Bauhinia variegata	Aries

8	Stereospermum suaveolens	Leo
9	Ficus benghalensis	Pisces
10	Prosopis cineraria	Aquarius
11	Dalbergia sisso	Capricorn
12	Ficus religiosa	Sagittarius



2. **Saraswati van-**This specific garden has been developed as per the relation of human brain with plants. According to Vedic science such garden is developed for to enhance concentration and brain capacity of pupils. This garden contains five trees are each planted five times. Hence this garden would consist 25 plants.

Sr. No.	Name of plant	No of plants
1	Ficus religiosa	5
2	Phyllanths emblica	5
3	Terminalia chebulla	5
4	Cocus nucifera	5
5	Terminalia catappa	5

Fable 14List	of Plants in	Saraswati	Garden
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3. Nakshatra van- According to vedic science, there are total 27 nakshatras (stars). Each nakshatra do have one specific sacred tree. In the Nakshatra van 27 tress are planted in a circular manner as per the 27 nakshatras. These plants are planted as follows.

Table	15L	list of	Plants	in N	lakshtra	Garden
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Sr. No.	Name of plant	Nakshatra (Stars)
1	Adhatoda vasica	Ashwin
2	Phyllanthus emblica	Bharni
3	Ficus glomerata	Krutika
4	Syzygium cumini	Rohini
5	Acacia catechu	Mrug
6	Terminalia bellarica	Arda
7	Bambusa Vulgaris	Punarvasu
8	Ficus religiosa	Pushya
9	Mesua ferrea	Ashlesha
10	Ficus benghalensis	Magha
11	Butea monosperma	Purva
12	Ficus arnottiana	Uttara

13	Jasminum officinale	Hasta
14	Aegle marmelos	Chitra
15	Terminalia arjuna	Swati
16	Limonium acidissimum	Vishakha
17	Mimusops elengi	Anuradha
18	Bombax ceiba	Jeshtha
19	Canarium strictum	Moola
20	Saraca indica	Purvashadha
21	Artocarpus heterophyllus	Uttarashadha
22	Calotropis gigantia	Shravan
23	Prosopis cineraria	Dhanishtha
24	Anthocephalus cadamba	Shatataraka
25	Mangifera indica	Purva Bhadrapada
26	Azadirecta indica	Neem
27	Madhuca indica	Revati



4. **Vrunda van-** In this garden different seven species of tulsi grown in an area, which forms '*Vrundavan*'. This contains following species of tulsi.



Table 16List of Plants	in	Vrindavan	Garden
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Sr. No.	Name of plant	Common name
1	Ocimum sanctum	Ramtulas
2	Ocimum tenuiflorum	Krushna tulas
3	Ocimum sanctum	Kapuri tulas
4	Ocimum americanum	American tulas
5	Ocimum grattisum	Vaijayanta tulas
6	Ocimum sanctum	Triguni tulas
7	Ocimum tenuiflorum	Pandharpuri tulas

8. OTHER ACTIVITIES

HEALTH AND SAFETY

The college has given special priority for human health and safety. The following various factors help to manage human health and safety.

a. Regular Health Check-up:

The college arrange regular Health check-up camp for students and faculty.



b. Separate Toilet facility:

Separate toilets are available for students and staff in the college.



c. First AID Box:

In case of any accidental injury, first aid boxes are available in the college.



e. Fire Extinguisher:

Fire Extinguishers have been set up in various places in the college so as not to cause the loss of life and financial loss through fire.



d. No Smoking, No Tobacco in the Campus Area:

Smoking and chewing of tobacco is strictly prohibited in the college campus.





f. Flexes for students discipline:

In order to create awareness among students and society, the college has setup flex boards / banners to spread awareness about the discipline related information in the college campus.



PUBLIC AWARENESS ABOUT ENVIRONMENTAL CONVERSATION:

Environment will not prevail if public awareness is not spread, keeping this thing in mind, the college has tried to aware students towards environmental conservation.

The college campus has put up banners / flex boards to create awareness about environmental conservation. Through this, the college tried its best to create awareness about environmental conservation.



a. Individual Role Related to Environmental Conservation.

- पर्यावरण संवर्धनासाठी व्यक्तिगत भूमिका -🗱 सर्व सजीवांविषयी आदर ठेवा. 🗱 लाकूड व कागद यांचा कमीत कमी वापर करावा. 🗱 झाडे लावा व त्यांचे मुलांप्रमाणे संगोपन करा. 🗱 रासायनिक खते व किंटकनाशक यांचा वापर टाळण्याचा प्रयत्न करावा. 🍁 सेंद्रीय शेतीचा प्रचार व प्रसार करावा. 🔆 सेंद्रीय उत्पादने खरेदी करण्यावर भर द्या. 🔆 आपल्या वाहनाचा आवश्यक असेल तेव्हाच वापर करा. 🗱 गरज नसेल तेव्हा दिवे व पंखे बंद करा. 🗱 प्रवासाठी जास्तीत जास्त वेळा सार्वजनिक वाहनांचा वापर करा. 🗱 किटकनाशके व विषारी रसायने,रंग पाण्यात अथवा जमिनीवर फेकु नका. 🔆 प्लॉस्टिक पिशव्या ऐवजी कापडी पिशव्यांचा वापर करा. 🗱 ई-कचरा संबंधीत यंत्रणेतच जमा करा. 🗱 कंपोस्ट खताच्या वापरावर भर द्या. 🗱 कचराकुंडीचा कचरा टाकण्यासाठी कटाक्षाणे उपयोग करा. 🗱 सार्वजनिक ठिकाणी स्वच्छता राखण्यास मदत करा. 🗱 आपल्या टी.व्ही.,रेडिओ,होम थियटर अथवा या सारख्या इतर संगीत माध्यमाचा आवाज मर्यादीत ठेवा. 🗱 ओला कचरा व सुखा कचरा वेगळा साठवून त्यांचे शास्त्रीय पद्धतीने व्यवस्थापन करा. 🗱 अपारंपारिक ऊर्जेच्या वापरावर भर द्या. 🗱 वृक्षतोड रोखण्यासाठी कायम दक्ष रहा. 🔆 पारंपारिक वन औषधी वनस्पतींचे जतन व संवर्धन करा. 🗱 फटाके मुक्त दिवाळी साजरी करा. 🗱 सण-उत्सव,नवरात्र उत्सव प्रसंगी शाडुच्या मूर्ती वापरा. चांगल्या बदलांची सुरवात स्वतःपासून होते ही जाणीव कायम 24 मनात ठेऊन आपली व्यक्तिगत भूमिका पार पाडा. पर्यावरणाचे संवर्धन करण्याचा निर्धार करूया, आरोग्यदायी जीवनासाठी पर्यावरणाचा आधार घेवुया...

b. Importance of Trees:



a. Anti-ragging Law

College has an active anti-ragging cells. Laws regarding anti-ragging have been displayed in the College campus as well as in the hostel for the betterment of the college. If any such incidence occurs, strict action is taken towards the victim.



e. Paperless Office

Deliberate efforts are made to use least amount of paper in administrative work, and academic work. The college prefers information technology like the website, em ail, WhatsApp, phone instead of the paperwork. E-sources are available for Faculty as teaching aids. Wi-Fi facility enables to create paperless activities.



f. Plastic Free Campus

The Government of Maharashtra has banned uses of plastic material. An initiative is taken to ban plastic bags in the college premises and promote to use paper bags.

9. RECOMMENDATIONS

Water harvesting, usage and waste water treatment

The college campus with more than 5 buildings has a high potential for the Rainwater Harvesting due to large terrace areas as well as the open surfaces (paved & unpaved areas). Based on the geotechnical survey of the campus area, the college should emphasize on recharging the ground water table with the rainwater. The college has already have a small pond for the storage of rainwater. Some more water storage tanks can be built in the College campus. This would satisfy part requirement of the campus in the monsoon season (i.e., about 80 – 90 days in a year) and thus reducing freshwater intake during rainy days).

It is recommended to install water efficient faucets and flushing systems across the campus which would reduce the freshwater requirement of the campus. Even though all the drain lines of the campus are connected to the common drain line, it is suggested that if the management is looking forward to overall environmental sustainability, then an Effluent Treatment Plant (ETP) may be installed. This would treat & recycle the wastewater within the campus and this treated wastewater can further be used either for flushing or landscaping, thus further reducing freshwater requirement of the campus by 50 - 60 % of the total. Such modular treatment plant can be used for environmental science student's practical course as well. To use the treated wastewater for flushing a separate plumbing system is required. It is recommended that liquid chemical waste from the laboratories should not be disposed

of without any treatment.

Noise Environment

- 1. In order make campus friendly for educational purposes, the noise levels need to be reduced as directed by Noise Pollution (Regulation and Control) amendment rules, 2000 and certain disciplinary measures need to be taken.
- 2. It is observed that due to the proximity of the campus to the main road, the noise pollution is high. It ranges from minimum of 50.0 dB (A) to maximum 73.6 dB (A) which is 23.6 dB (A) over the stipulated standard. This would mean students are getting exposed to high noise pollution levels within the campus due to either internal activities or external activities. This would create hurdle in learning and their overall health.
- 3. It is recommended that the campus to have noise barriers along the fence line either in terms of natural barriers such as trees or artificial barriers such as acoustic fence. A combination of both can also be used at appropriate locations.
- 4. It is recommended that parking lots within the campus to be made strictly as <u>no honking</u> <u>zones</u> and vehicles with unwarranted vehicle silencers (mufflers) not be allowed.

Fig. 4: Types of noise barriers





Biological noise barrier structure - trees

Plant diversity

To maintain the college campus green and eco-friendly, more trees need to be planted. A thick green belt (of *Ficus benjamina*) development along the fence is strongly recommended. The plant diversity shall be maintained by avoiding the plantation of exotic plant species. A tree monitoring committee is to be established; if not present currently. The college authorities should ensure frequent meetings with the tree monitoring committee.

Carbon neutrality can be maintained on the campus by developing more greenery. The plant species that are found suitable are suggested for plantation and greenbelt development. In addition to above some flowering plants, shrubs, herbs, and climber plants species will also be planted for beautification in the campus.

Criteria for selection of tree species

The choice of species is based on the adaptability to the site, early returns, multiple uses, complimentary role to the system and its possible role during the lean/critical periods. The key factor contributing to the success of tree planting is selection of suitable tree species. Some of the considerations for selection of tree species are:

- Species adapted to local soil and agro-climate condition.
- Drought resistant species that can survive long dry periods.
- Multipurpose use species.
- Species that can serve for soil and water conservation.
- Species that help in building up soil fertility.
- Species that have good coppicing ability.

For the purpose of landscaping, following eight categories are recommended.

- 1. <u>Avenues</u> Trees to shade roads or create avenues in the college campus.
- 2. <u>Parking</u> Shade giving trees for open parking lots.
- 3. <u>Ornamentals</u> the purpose indicates:

- a. Thicket To be grown in groups to form a thick vegetated corner, center or pocket.
- b. Isolation To be planted singly either in corners or as central attraction.
- c. Scattered To be planted at random to be able to appreciate its ornamental nature.
- d. Groups To be grown in groups of 3 to 4.
- 4. <u>Hedges/Edges/Screens</u>.
 - a. Hedges for property hedges, for demarcating areas etc.
 - b. Edges for edging of small flower patches, for setting boundaries, for layering etc.
 - c. Screens Provide privacy, as screens from pollution from adjoining road or to provide shadow from south sun.
- 5. <u>Ground covers</u> These include native lawn varieties and plant species that spread laterally and can be used to cover soil below trees etc.
- 6. <u>Temple plants</u> Trees normally associated with religious areas e.g. *Ficus benghalensis*.
- 7. <u>Climbers</u> Plants that can be used for forming trellis, etc.
- 8. <u>Aquatic plants</u> For ponds or water bodies.

Some of these plants need to be maintained by regular pruning to prevent excessive growth. The plant species suggested for green belt development in addition to the present one layer of vegetation on the boundary would be helpful for mitigating gases and particulate matter. It can also help in reducing noise from the heavy traffic road close to the campus will serve for long time.

Rotanical Nama	L ocal Nama	Family	Habit	Flower		
	Local Maine	Family		Color		
First Row-trees (outermost)						
Drypetes roxburghii	Putranjiva	Euphorbiaceae	Tree	Greenish Yellow		
Holoptelea integrifolia	Wavli	Ulmaceae	Tree	Greenish		
Terminalia cuneata	Arjun	Combrataceae	Tree	Yellow		
Terminalia paniculata	Kinjal	Combrataceae	Tree	Greenish-white		
Terminalia tomentosa	Ain	Combrataceae	Tree	White		
Bambusa arundinacea	Bamboo	Poaceae	Bamboo	White, greenish		
Dendrocalamus strictus	Velu	Poaceae	Bamboo	Blackish		
Cordia dichotoma	Bhokar	Boraginaceae	Tree	White		
Dalbergia latifolia	Shisam	Fabaceae	Tree	White		
Diospyros peregrine	Tembhurni	Ebenaceae	Tree	White creamy		
Garcinia indica	Kokam	Clusiaceae	Tree	Yellowish		
Haldina cordifolia	Hedu	Rubiaceae	Tree	Red yellowish		
Ficus benghalensis	vad	Moraceae	Tree	Green and Red		

Table 11: List of suggested plants (an appropriate few plants can be used)

Botanical Name	Local Name	Family	Habit	Flower		
Shuth Layon						
Cardonia aummifora Dikomali Dubiacaca Shmih White						
Garaenia gummijera	Dikeman	Rubiaceae	Sillub			
Ixora coccinea	Bakara	Rubiaceae	Shrub	Orange / Red		
Ixora nigricans	Kat-Kuda	Rubiaceae	Shrub	White		
Justicia adhatoda	Adulsa	Acanthaceae	Shrub	White		
Helicteres isora	Murudsheng	Sterculiaceae	Shrub	Red bright		
Murraya koenigii	Kadhipatta	Rutaceae	Shrub	Greenish White		
Murraya paniculata	Kunti	Rutaceae	Shrub	White		
Hiptage benghalensis	Madhvilata	Malpighianceae	Climber	White		
Ehretia laevis	Ajan	Ehratiaceae	Tree	White		
Vitex negundo	Nirgudi	Verbenaceae	Shrub	Bluish - Purple		
Woodfordia fruticosa	Dhyati	Lythraceae	Shrub	Red		
Gardenia resinifera	Dikemali	Rubiaceae	Shrub	White		
Cassia auriculata	Tarwad	Caesalpiniaceae	Shrub	Yellow		
	Second Row	(from outside)				
Artocarpus heterophyllus	Phanas	Moraceae	Tree	Green		
Azadirachta indica	Neem	Meliaceae	Tree	White		
Bauhinia recemosa	Apta	Caesalpiniaceae	Tree	White		
Butea monosperma	Palas	Fabaceae	Tree	Orange-red		
Lagerstroemia microcarpa	Nana-bondara	Lythraceae	Tree	White		
Lagerstroemia reginae	Taman	Lythraceae	Tree	Pink		
Kydia calycina	Warung	Malvaceae	Tree	White		
Along the paths						
Caryota urens	Bherali mad	Arecaceae	Tree	Red & green		
Casssia fistula	Bava	Caesalpiniaceae	Tree	Yellow		
Mammea surgia	Surungi	Clusiaceae	Tree	White		
Phoenix sylvestris	Shindi	Arecaceae	Tree	White		
Nyctanthes arbor- tristis	Parijatak	Oleaceae	Tree	White		
Nerium indicum	Kanher	Apocynaceae	Small/	Pink/white		
			Tree			
Other Suggested Plants						
Madhuca latifolia	Moha	Sapotaceae	Tree	White		
Mallotus philippensis	Kumkum	Euphorbiaceae	Tree	Yellow		
Manilkara hexandra	Khirni	Sapotaceae	Tree	White		
Memecylon umbellatum	Anjani	Melastamaceae	Tree	Bluish - Purple		

Rotanical Name	Local Name	Family	Habit	Flower	
Dotument i tume				Color	
Michelia champaca	Sonchafa	Magnoliaceae	Tree	Yellow	
Mimusops elengi	Bakul	Sapotaceae	Tree	White	
Mitragyna parvifolia	Kadamb	Rubiaceae	Tree	Red yellow	
Morinda pubescens	Bartondi	Rubiaceae	Tree	White	
Neolamarckia cadamba	Kadamb	Rubiaceae	Tree	White creamy	
Pandanus odoratissimus	Kewada	Pandanceae	Tree	Yellow golden	
Pongamia pinnata	Karanj	Fabaceae	Tree	Pinkish white	
Santalum album	Chandan	Santalaceae	Tree	Brownish red	
Sapindus laurifolius	Ritha	Sapindaceae	Tree	White	
Semecarpus anacardium	Bibba	Anacardiaceae	Tree	Greenish white	
Syzygium cumini	Jambhul	Myrtaceae	Tree	White	
Thespesia populnea	ParasBhendi	Malvaceae	Tree	Yellow	
Trema orientalis	Gol	Ulmaceae	Tree	White cremy	

Waste Management

- 1. E waste to be segregated and handed over only to the dealer / facility authorised by Maharashtra Pollution Control Board (MPCB);
- 2. Batteries' waste to segregated and handed over only to the dealer authorised by Maharashtra Pollution Control Board;
- 3. It is recommended that the wet garbage to be segregated appropriately which further can be processed and treated within the campus either by using vermicomposting or biomethanation process.
- 4. The fertilizer from either of the methods can further be used as manure for the landscaping within the campus. If the biomethanation is to be used to treat the wet garbage, the biogas generated from the process can be used for the canteen either for common canteen / hostel canteens.
- 5. Chemical waste (solid/ semisolid) from the laboratories not to be disposed in municipal solid waste. Based on the physico-chemical properties of the waste, it should be handed over to the MPCB authorised chemical/ hazardous waste management facility only.
- 6. Recycling of papers to be used for day today printing and other activities.

Air Environment

It is recommended that only Pollution under Control (PUC) certificate holding vehicles to be allowed in the campus.

Trees tolerant to air pollution to be planted along the fence line.

It is suggested that, a detailed air pollution study of the institute campus to be carried out to identify the exact source of the air pollution and appropriate measures to be taken.

Safety Aspects

Teaching and non-teaching staff to be trained for emergency situations.

Emergency exits to be established for the spaces including laboratories.

Eye wash systems to be installed in chemistry laboratory. Periodic mock drills to be conducted.

Personal Protective Equipment's (PPEs) to be used at locations including chemistry laboratories to avoid any accident.

Parking safety to be followed.

Special safety features to be followed at Day school and primary school.

10. CONCLUSION

Considering the fact that the institution is predominantly an undergraduate college, there is significant environmental research both by faculty and students. The environmental awareness initiatives are substantial. The Vermin Compost plant and paperless work system practices are noteworthy. Besides, Tree Plantation Programs initiated by the administration shows how the campus is going green. Few recommendations are added for green campus, minimize noise pollution and to curb the menace of waste management using eco-friendly and scientific techniques. 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 includes Illumination, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Being located isolated from the residential and market area of the city, the college gets fresh and pure air in the classrooms.

1. Dr. Pravin M. Nalawade

Certification No.: IN/14019/144609 Green Cover Mapping and Study of Biodiversity

- 2. Dr. Jagruti R. Chavan Certification No.: IN/14019/144775 Water, Air and Noise Audit
- 2. Smt. Vishakha R. Wagh Certification No.: IN/14019/144777 Waste Management

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3. Mr. Kailas D. Ahire Other Activities
