

Maratha Vidya Prasarak Samaj's

Arts and Commerce College, Khedgaon

Post-Khedgav Ta: Dindori Dist: Nashik Pincode: 422205

Green Audit Report

Academic Year 2020-21



Prepared by



Eureka Environment Consultant

We Care Our Environment

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1.0 Introduction

The two major outputs of the twentieth century, modernization and industrialization, have made human life more luxurious and comfortable. They are, on the other hand, responsible for the indiscriminate use of natural resources, the exploitation of forests and wildlife, the production of huge solid waste, the pollution of limited and sacred water supplies, and, ultimately, the unsightly and inhospitable state of our mother Earth. People are becoming more aware of global issues such as global warming, the greenhouse effect, ozone depletion, and climate change, among others. Mother Earth is now thought to have made her final decision. It is past time for people to wake up, unite, and fight for a more sustainable environment.

Green Audit is the most effective ecological instrument for resolving such issues. This type of audit was created in the late 1970s with the goal of inspecting the work that was being done within the institution. It is the systematic identification, quantification, recording, reporting, and analysis of ecological diversity components, as well as the financial or social expression of the same. Green audit provides guidance on how to improve the environmental conditions.

1.1 Green Audit

Green Audit assists colleges in determining whether they are overusing or underusing various types of environmental resources such as water and energy. It also helps in the assessment of college's impact on numerous environmental factors. Green auditing raises health awareness while also raising environmental awareness. The goal of the green audit is to improve understanding of green impacts on college campuses and encourage resource sustainability. If self-assessment is a natural and necessary part of a good education, institutional self-assessment may be said to be a natural and necessary part of a good educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. 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.

People have recently been observed to be unconcerned about the environment. Human actions have a direct or indirect negative impact on the environment, resulting in a variety

of environmental challenges. The increase in world population, significant advances in science and technology, and globalization are all contributing to changes in the eco system. Global warming, ozone depletion, air pollution, and water pollution are some of the issues that develop as a result of this. 'Environmental Audit' is another name for 'Green Audit.' It is the most environmentally friendly method of resolving environmental issues.

Furthermore, in any educational institution, a clean and healthy environment is one of the desired pre-requisites. To achieve this, our institution places a strong emphasis on implementing green practices and raising environmental awareness among all of its stakeholders. This process of making the campus eco-friendly is made easier by the active participation of stakeholders. Adopting energy saving methods, proper waste management, waste water treatment, and tree plantation are some of the strategies employed to make the campus environmentally friendly. Rainwater harvesting, solar street lamps, solid and liquid waste, greening the campus, and no vehicle day are all examples of green practices. Furthermore, the college has an active Eco club that organizes numerous activities to raise student awareness, such as awareness rallies and competitions. Further, academic activities such as study tours/visits. Cleaning of campus and the nearby villages on different occasion and projects are also arranged in accordance to Green policy

1.2 Benefits of Green Audit:

In recent years, a Green Audit of an institution has become increasingly significant for self-assessment, as it represents the organization's participation in addressing current environmental issues. Since its establishment, the institution has worked to keep our surroundings clean. As a result, the current green audit's goal is to identify, quantify, explain, and prioritize a framework for environmental sustainability that complies with applicable rules, policies, and standards.

The Government of India issued the National Environment Policy 2006 in 2006, making green auditing essential for all industries. According to the policy, it is a reaction to India's national commitment to a clean environment, as enshrined in Articles 48 A and 51 A (g) of the Constitution (DPSP), and bolstered by judicial interpretation of Article 21. (National Environmental Policy 2006). It is acknowledged that maintaining a healthy environment is not just the responsibility of the government. Every citizen bears responsibility, and via the country's environmental management, a spirit of partnership is to be established.

The Supreme Audit Institution (SAI) formalized the environmental audit process by following the rules outlined in the Manual of Standard Orders (MSO) released by the Authority of the Controller and Auditor General of India in 2002. The Supreme Audit Institution of India is the country's highest national auditing institution. Because of the necessity for environmental accountability, NAAC, an autonomous agency under the UGC, has included the notion of environmental audit in university and college accreditation processes.

Furthermore, it is part of the Higher Educational Institutions' corporate social responsibility to ensure that they contribute to the decrease of global warming through carbon footprint reduction methods.

- It would aid in the preservation of the ecosystem on and around campus.
- Recognize cost-cutting strategies such as waste reduction and energy conservation.
- Determine the current and upcoming difficulties.
- Give the organization the tools it needs to improve its environmental performance.
- It promotes a positive image of the university by maintaining a clean and green campus.
- Finally, it will contribute to the creation of a favorable impression for the future NAAC visit.

1.3 Requirements of NAAC Accreditations

When asked why Environmental Audits, which are required for industries, are also required for educational institutions, the only answer that comes to mind is: The possibility for environmental conservation and growth in educational institutions is the only response that appears at that moment.

According to NAAC Criterion VII, institutional values and best practices, a college must respond to a variety of questions about environmental sustainability and conciseness. The questions such as Weather institution has facilities for alternate sources of energy and energy conservation measures? Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste? Water conservation facilities available in the Institution, Green campus initiatives implemented by college. In

this regards, throughout the year every college runs various types of actives. College prepare various policies to maintain and support environment.

Under Criterion VII sub point 7.1.6 every college needs to conduct Green Audit, Energy Audit, Environmental Audits etc., and need upload the reports in every years AQAR. The goal of making all of these audits mandatory through NAAC is to help universities become more environmentally friendly and sustainable. NAC has included these challenges in its assessment of the need of the hour, recognising that schools can better achieve the United Nations' Sustainable Development Goals.

1.4 Profile of Maratha Vidya Prasarak Samaj's



The 108-year-old Maratha Vidya Prasarak (MVP) Samaj in Nashik is a well-known educational institution in Maharashtra. MVP Samaj's great thinkers correctly laid the "*Bahujan Hitay, Bahujan Sukhay*" foundation. The institute aspires to offer the horizons of education to the impoverished sectors of society, as its slogan states, "well-being and happiness of the masses." Discipline, Quality, and Transparency are the three guiding principles of the institute.

The Institute began as a boarding school in 1914, with 5 students and a grant of Rs. 1000/- from Rajarshi Shahu Maharaj, the then Chatrapati of Kolhapur. This 100 years old renowned

educational institute is in the jurisdiction of University of Pune. At present, the total number of students in its 350 educational and professional institutions is 1,81,683, with a total of 7,478 staff. The budget for the year is Rs. 275 crores. The spectrum of educational institution encompasses Primary Schools, Secondary Schools, Graduate & Postgraduate Colleges, Professional & Vocational Colleges. It was one of the greatest milestones in the pre-independence history of Nashik. The wellbeing in general and education in particular were considered the sole of human being.

The founders of the samaj were inspired and driven by the great work of *Mahatma Jyotiba Phule* and *Chhatrapati Rajarshi Shahu Maharaj* of Kolhapur. The pioneers, devoted and dedicated team of MVP Samaj includes the names of great social workers and educationalists as – *Karmaveer Raosaheb Thorat, Bahusaheb Hiray, Kakasaheb Wagh, Annasaheb Murkute, Ganpatdada More, Kirtiwanrao Nimbalkar, D.R.Bhosale, Vithoba Patil Jadhav*. The students & professionals produced by the institutions of NDMVP Samaj forum the real backbone of modern society.

Table No. 1.1 List of Branches in Higher Education

Sr. No.	Institution Category	Total Units
1.	D.Ed. College	4
2.	B.Ed. College	1
3.	Arts, Commerce and Science College	22
4.	College of Pharmacy	1
5.	College of Architecture	1
6.	Bachelor of Design	1
7.	Nursing College	1
8.	Management Institutes (IMRT)	1
9.	Training and Skills Development Centre	1
10.	Competitive Exam Guidance Centre	1
11.	Medical College	1
12.	Medical College Hospital and Research Centre	1
13.	D.Pharmacy	1
14.	Training College of Nursing	1
15.	College of Engineering	1
16.	College of Agriculture	1
17.	College of Physiotherapy	1
18.	Law College	1
19.	College of Social Work	1

20.	Polytechnic	1
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1.5 Profile of MVP's Arts and Commerce College:

MVP Samaj has a branch in Khedgaon called Arts and Commerce College. The college began in a school facility in 2003 with just 20 students enrolled in the B.A. and 14 students enrolled in the B.Com. programmes. Our college's major goal is to provide higher education chances to students from rural and tribal areas. It is a part of Pune's Savitribai Phule Pune University. It is a non-aided, multi-facilitated, co-educational college.

It is one of Dindori Tehsil's five colleges. The institution is managed by the Maratha Vidya Prasarak Samaj, Nashik, a well-known educational institute in Maharashtra. The college, which is associated with Savitribai Phule University in Pune, was founded with the goal of providing higher education to students from villages and adjacent rural areas. Over the years, the strength of college students has steadily increased. Khedgaon's Arts and Commerce College made a significant contribution to students who could not otherwise afford higher education. It has complete Arts and Commerce faculties that lead to a U.G. degree. There are four specific subjects at the B.A. level: Marathi, Economics, Political Science, and Psychology, while the Commerce faculty offers Business Administration and Marketing at special level.

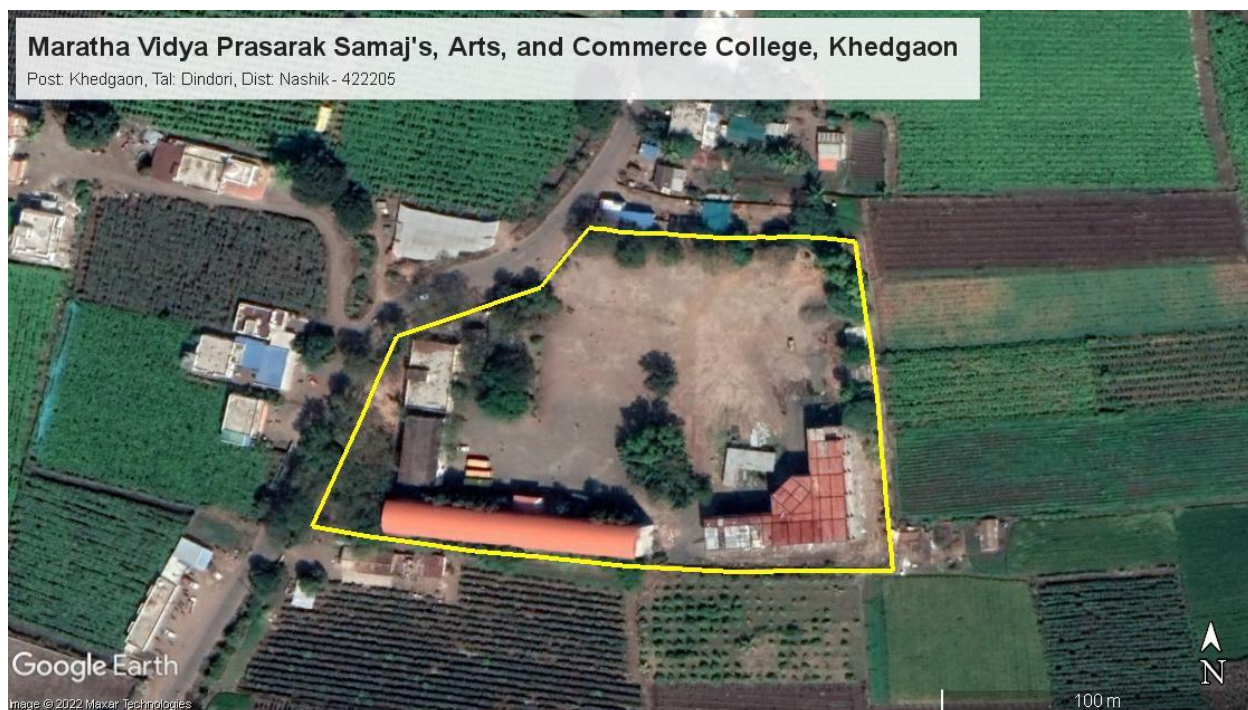


Figure No. 1: Google Image of Arts and Commerce College, Khedgaon

The college employs roughly 25 people, including 16 teachers and nine non-teaching personnel. In the current academic year, there are 380 students in total (2020-21). The College is situated on 4.20 acres of land, with a precious building with a built-up area of 2707.50 sq. m. and suitable educational infrastructure. Students offered with undergraduate programmes in the faculty of Arts and Commerce. The college employs highly skilled teaching and non-teaching staff that are efficient and dedicated. The institution contributes to national development by giving educational opportunities to students who are socially and economically disadvantaged.

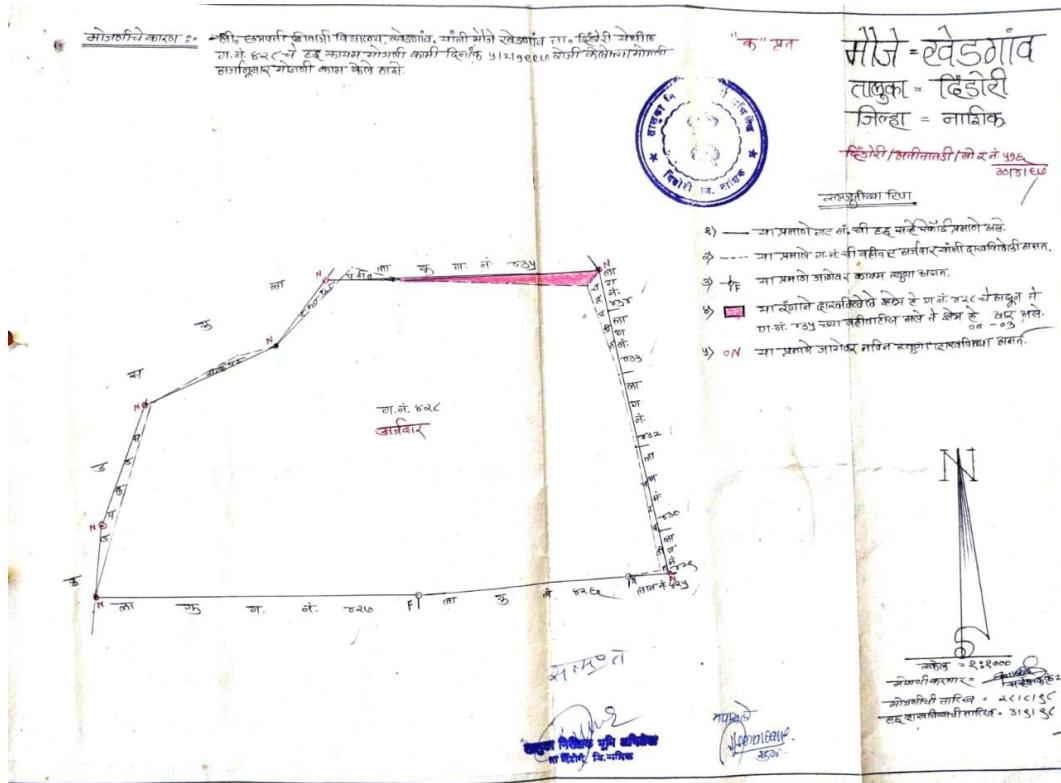


Figure No. 2: Layout Map of Arts and Commerce College, Khedgaon

Table No. 1.2 Courses offered by College

Sr.NO.	Name of Faculty	Name of Program	Name of Subject
1.	Arts	BA	Economics, Psychology, Political Science, Marathi
2.	Commerce	B.Com	Marketing Management, Business Administration

2.0 Methodology Used for Green Audit

With the importance of Green audit in mind, the current study examines the process of environmental audit and the important steps that academic institutions may do to help the environment. Green audit is done through various stages.

2.1 Pre Audit Stage:

The implementation of a College Green Audit/ Environmental Conservation Committee (ECC) by an organization is the first and most essential part of a green audit. The ECC is the backbone of the auditing process, with a wide range of responsibilities. This system keeps track of every facet of the green audit. The following table shows the details of college ECC.

Table No. 2.1 College Green Audit/ Environmental Conservation Committee

Sr. No.	Name of Member	Designation	Title in Committee
1.	Dr Mrs Sunanda Tanaji Wagh	Principal	Chairman
2	Prof. A. K. Bachate	Assistant Professor	IQAC Coordinator
3.	Prof Nilesh Nikam	Assistant Professor	Coordinator
4.	Dr Deepak N Kare	Vice Principal	Member
5.	Dr. D. S. Gadakh	Physical Director	Member

The ECC should declare an organization's "Environmental Policy" and communicate it to all teachers, nonteaching staff and students. The policy reflects the organization's environmental sustainability goals, objectives, scope, and priorities. ECC should provide all the necessary base line data to external auditing agency.

The ECC shall organize and carry out its programs and operations in a thorough and systematic way, as stated in the declared environmental policy. Before such operations are planned, the environmental issues of the organization, as well as their legal obligations, should be evaluated.

ECC members must define roles, responsibilities, and authorities of key personnel during the implementation and operation processes, commit to staff training, maintain effective communication channels, adopt effective documentation and operational controls, and maintain sufficient emergency preparedness awareness among the staff. All implemented

programs and processes should be evaluated by the ECC, which should then be modified in accordance with the environmental policy.

2.2 Onsite Audit Stage

Higher education institutions must conduct and verify their own Audit through external auditing organizations. The ECC of the college plans the visit of auditor's from external agencies and execute the audit process. During the visit, the auditor thoroughly examines the documentation and makes any required comments. The auditor conducts an audit of the Environment Policy by evaluating documents and conducting personal interviews with stakeholders' representatives. The auditor also conducts an assessment of all planned and implemented programs or activities through document evaluation and personal interviews with stakeholders' representatives.

2.3 Post Audit Stage:

An auditor's role at the post-audit stage to analyze, interpret the provided baseline data and onsite observations and prepare a detailed audit report. In relation to the higher education institute, the auditor evaluates all of the audit's facts and observations together. The auditor must evaluate all the findings as per the available standard norms. In consultation with the ECC, the auditor creates a brief report of the audit, including recommendations. External auditors must provide detailed recommendation to ECC of the higher educational institution. According to an auditor's suggestions, the ECC should devise an action plan and carry it out successfully. The auditor monitors the programs or activities on a regular basis. An organization will be awarded a certificate if the audit is completed successfully.

3.0 Environmental Aspects Covered under Green Audit

3.1 WATER ENVIRONMENT:

3.1.1 WATER AUDIT:

Water conservation is not only good for Society and the environment; it's also excellent practice. Water conservation can help you save money on your water, wastewater, and energy bills, as well as reduce on-site treatment expenses. Every company is different, but a water audit is a good place to start.

Water audits allow you to inventory all of your facility's water uses and suggest strategies to improve water efficiency. The findings can assist you in prioritizing actions to take in order to adopt cost-effective water-saving measures. A water audit might help you save money by lowering your water bill at home (and sewer bill if you are connected to a public sewer system). By applying easy conservation measures and without dramatically altering your lifestyle, you may reduce your water usage by up to 30%.

Table No. 3.1 Total Population of the Campus and Water Quantity Requirement

Sr. No.	Particulars	Total number	Required Water Supply (lpcd)	Water Requirement (lpcd)
1.	College Staff - Teaching and Non-Teaching	25	45	1125
2.	College Students (Girls and Boys)	380	45	17100
3.	Floating Population (Visitors)	40	45	1800
	Total	445		20025

Water demand for various institutions, in addition to home consumption, is also analyzed for a town or city. Hospitals, schools, restaurants, hotels, railway stations, bus terminals, and offices of various departments are all found in a well-developed city or town. On average, additional per capita demand for these units ranges from 25 to 60 liters per head per day (lpcd), depending on the village, town or city. As per the standard guidelines given in National Drinking Water Mission the service level benchmark is to provide 150 lpcd

water supply for metro cities, 135 lpcd for other cities/towns with sewage system and 45 lpcd without sewage system city/town. The minimum water demand according to the world health organization (WHO) is 20 liter per person per day.

3.1.2 Water Storage Capacity:

On the roof of the college are two water storage tanks with 5000 liters capacity and another one of 50,000 liters capacity is situated in college premise. The Khedgaon Grampanchayat well is the only source of water for college. Only that well provides the appropriate amount of water to the college on a regular basis. According to the discussion with ECC, the college as well as the school adjacent to the college premises use water from 50,000 liter water tank. The other two 5000 liter overhead water tanks were filled twice a day. Based on available data and water supply benchmarks as per the National Building Code (NBC), if college students use water for two available above tanks, the campus college receives only 25 liters less water per day. The college population has been steadily expanding in recent years, necessitating the installation of a new 5000-liter water tank on the roof of the college building.

Table No. 3.2 shows the physicochemical and microbiological properties of drinking water.

Table No. 3.2 Drinking Water (Well Water) Analysis Results

Sr. No.	Parameter	Unit(s)	Well Water	Limits as per IS 10500: 2012 (Acceptable /Permissible)	Analysis Method
1.	pH	--	7.62	6-7.5	Instrumentation
2.	Conductivity	dSm-1	0.838	0.1-1	Instrumentation
3.	Calcium as Ca	mg/lit	93.6	75-200	Titration
4.	Magnesium as Mg	mg/lit	36.36	30-100	Titration
5.	Sodium as Na	mg/lit	27.1	4.5-60	AAS
6.	Potassium as K	mg/lit	1.7	2.0-5.0	AAS
7.	Carbonates as CO ₃ ²⁻	mg/lit	42	3.0-45	Titration
8.	Bicarbonates as HCO ₃	mg/lit	231.8	10-610	Titration
9.	Chlorides as Cl ⁻	mg/lit	113.6	250-1000	Titration

10.	Total Hardness as CaCO ₃	mg/lit	440	300-600	Titration
11.	TDS	mg/lit	690	500-2000	Gravimetric
12.	Sulphates as SO ₄	mg/lit	70.54	<200	Spectrophotometer
13.	Iron as Fe	mg/lit	0.00	<5.0	AAS
14.	Total Coli form	No./100ml	Present (Non fecal contamination)	Absent	IS: 1622 (Rev.1,R.A : 2014)
15.	E. coli Bacteria (Fecal Coli form)	No./100ml	Absent	Absent	
16.	MPN/100 mL	No./100ml	220 MPN/100 mL	<2.2 MPN/100mL	

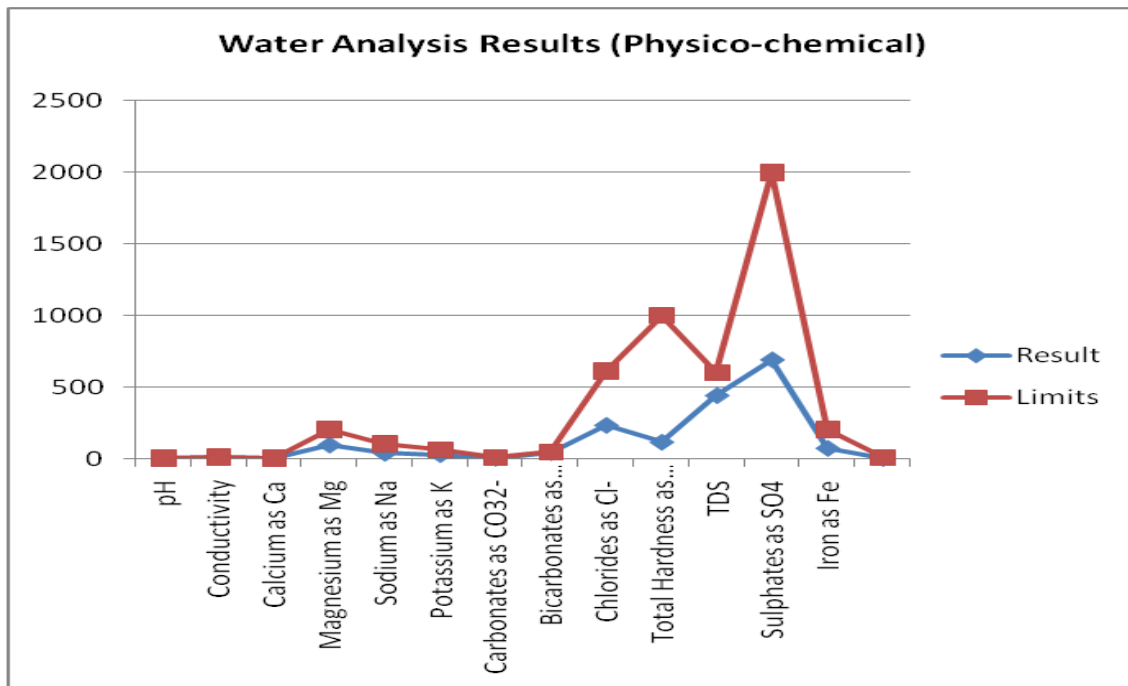


Figure No. 3 Physico-chemical Assessment of Drinking Water

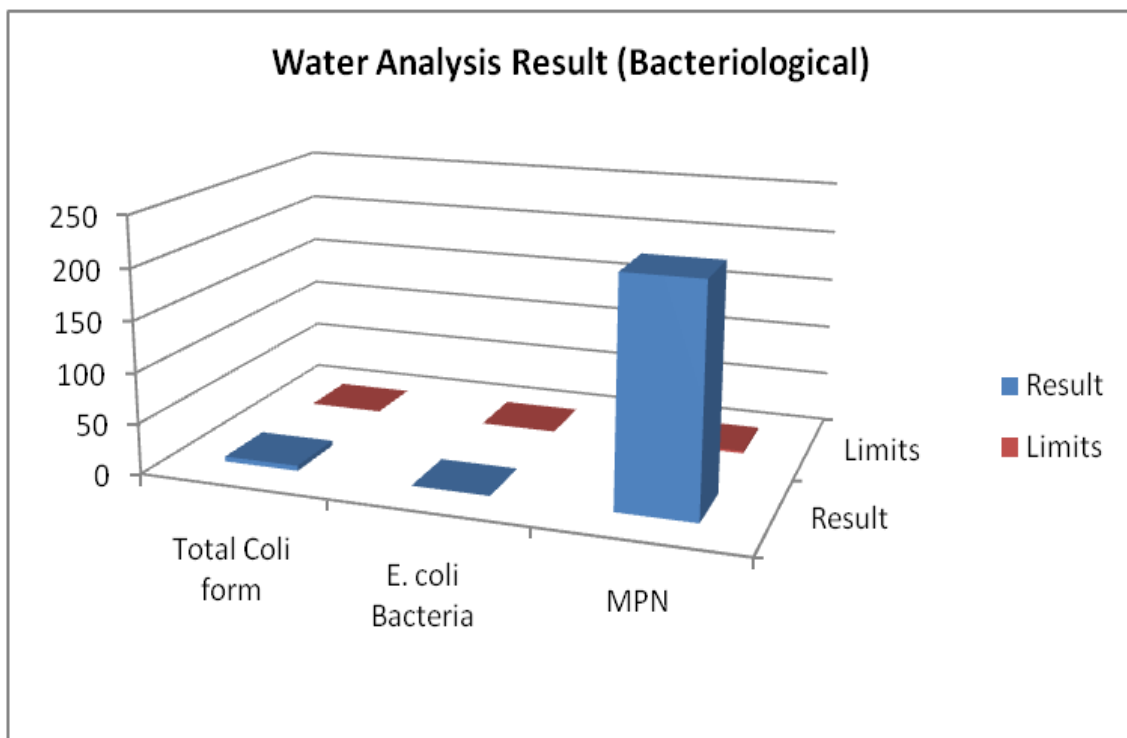


Figure No. 4 Bacteriological Assessment of Drinking Water

Some physico-chemical parameters, such as total hardness, TDS, carbonates, bicarbonates, calcium, and magnesium, are found to be over the acceptable limit but within the permissible limit in the above reports. Water is discovered to be polluted with non-fecal coliform after bacteriological parameters are assessed. MPN is also found in excess of the standard limit.

3.1.3 Quantification of Wastewater:

Table No. 3.3 Quantification of wastewater generation on college campus

Sr. No.	Particulars	Total number	Required Water Supply (lpcd)	Water Requirement (lpcd)	Total Wastewater Generated (lpcd)
1.	College Staff - Teaching and Non-Teaching	25	45	1125	900
2.	College Students (Girls and Boys)	380	45	17100	13680
3.	Floating Population (Visitors)	40	45	1800	1440
	Total	445		20025	16020

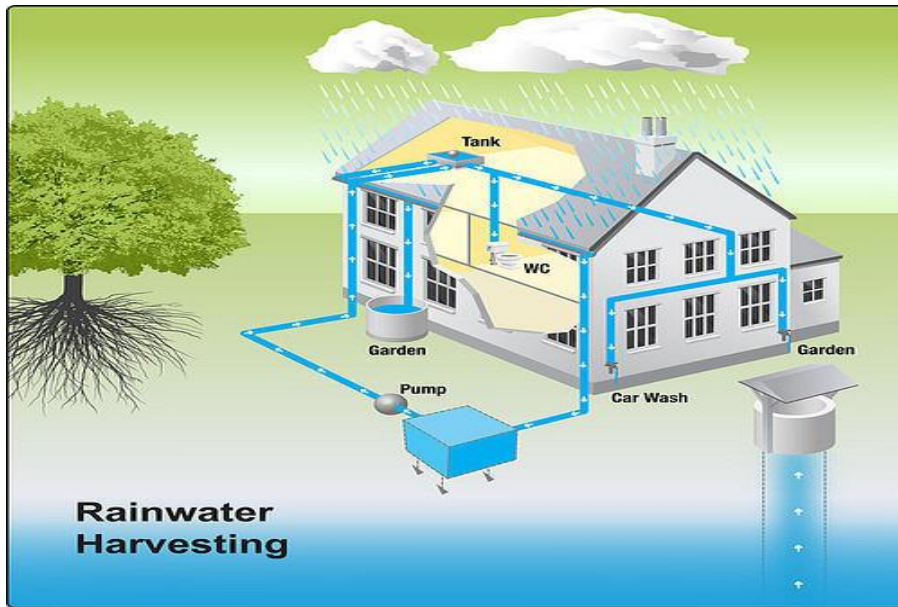
As a result, it's been determined that water should only be used after proper pre-treatment, chlorination, and UV exposure.

It is reported that the college gets its water from a grampanchayat well. The quality of fresh water has degraded as a result of widespread consumption by locals and college. As a result, a water purification system is required. Cleaning water tanks on a regular basis is also very important. The water quality is NON POTABLE. As a result, immediate action is essential.

According to the Central Public Health and Environmental Engineering Organization (CPHEEO), wastewater accounts for 70-80 percent of total water supplied. The Arts and Commerce College, Khedgaon generates roughly 16000 liters of wastewater per day, based on the number of users and per capita water used. In rural areas, the average person uses 10 lpcd of water for sanitation (toilet/ablution). It means that 4450 lpcd of water is generated in a college's toilets and bathrooms. For improved treatment, the college has already built a septic system and a soak pit. The septic tank has a capacity of roughly 15000 lpcd and a three-day detention time. Other maintenance activities and at 50000 liter drinking water tanks generate the remaining 10 to 12 thousand litres of wastewater, which can be directly redirected and used to irrigate plants on the college campus.

3.1.4 Rainwater Harvesting.

In terms of managing their natural resources, higher education institutions (HEIs) have a great deal of autonomy. They are virtually self-governing and internally regulated, whereas people, businesses, industries, and others are subjected to strict external oversight and accountability. This ability to self-regulate, with their own university presidents presiding over their own resource management system as the final authority, can serve as a springboard for water conservation. Every individual and system must have water conservation embedded not only in their minds, but also in their actions.



a. Rooftop Rainwater Harvesting:

The average rainfall at this location varies between 0.4 mm in the driest month (February) and 150.2 mm in the wettest month (September). The total annual rainfall in an average year is 607 mm. The Arts and Commerce College, Khedgaon is spread over 4.2 acres (16997 sq. meter) of land. Out of which buildings are constructed over 2200 sq. meters of the area. The remaining available land is totally unpaved areas which comprises about 3.65 acres (14796 sq. meter) area for surface water harvesting.

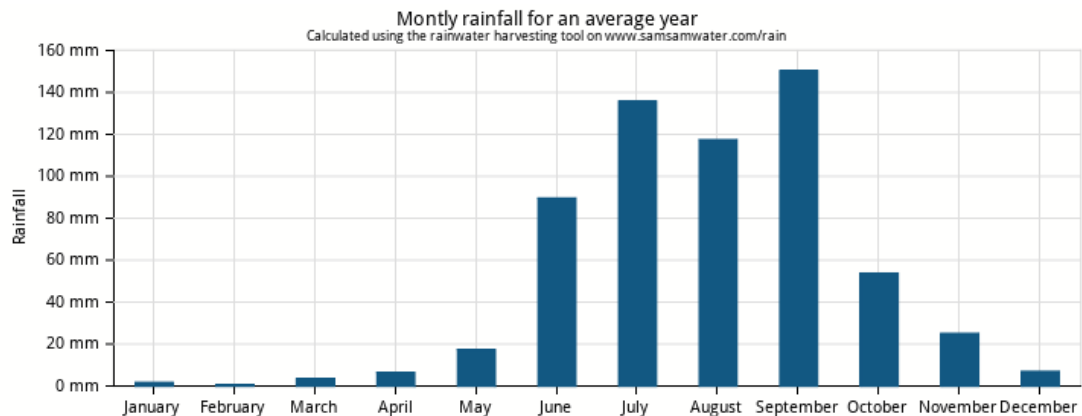


Figure No. 5 Monthly Rainfall for Khedgaon Vilege (Dindori Tehsil)

**Table No. 3.4 Rooftop Rainwater harvesting potential of
Arts and Commerce College, Khedgaon**

Sr. No.	Months	Total Unpaved Area (Sq. meters)	Relief Coefficient for unpaved area	Rainfall (mm)	Total Water Available for Harvesting (Litres)	Percent Water Demand fulfilled by Rooftop Rainwater Harvesting
1	Jan	900	0.70	0.6	378	2
2	Feb	900	0.70	0.4	252	1
3	Mar	900	0.70	0.8	504	3
4	Apr	900	0.70	10	6300	31
5	May	900	0.70	18	11340	57
6	Jun	900	0.70	90	56700	283
7	Jul	900	0.70	138	86940	434
8	Aug	900	0.70	118	74340	371
9	Sep	900	0.70	150	94500	472
10	Oct	900	0.70	54	34020	170
11	Nov	900	0.70	23	14490	72
12	Dec	900	0.70	13	8190	41

The runoff coefficient of a flat roof is 0.7, which suggests that 70% of the rain can be collected. Based on this runoff coefficient with a roof area of 900 square metres, 252 litres of water can be collected in the driest month (February) and 94626 litres in the wettest month (July) (September). In an average year, the total amount of water that may be collected from the roof is 382500 litres. The entire amount of rainwater that college roof can gather is insufficient to meet the whole water demand. Construction of a rainwater collection system, however, may still be useful. A rainwater collecting system with a storage capacity of 183900 litres could provide 1048 litres of water per day, or 5 percent of total consumption.

In the months of January, February, and March, the percentage of water demand met by a rooftop rainwater harvesting system is minimal. Following the calculations, it was discovered that in the months of April and May, the rainwater harvesting system could meet 31 percent and 57 percent of the college's entire water consumption, respectively. Rooftop rainwater collecting meets 72 percent and 41 percent of water demand, respectively, during the winter months of November and December, depending on available rainfall. During the rainy months of June, July, September, and October, college

roofs were able to harvest 283 percent (14 times), 434 percent (21 times), 371 percent (18 times), 472 percent (23 times), and 170 percent (8 times).

Surface Rainwater Harvesting of Unpaved Area:

Rainwater is the primary natural source of water. Depending on the geography of the campus, water can be harvested. This can include both paved and unpaved areas. Paved water captures and offers a greater quantity of water for location-specific groundwater recharge and harvesting efficiency. Rainwater is also a universal trash carrier throughout its path. To maintain a free flow of clean water and a greater recharging of rainwater, it is critical to keep the rainwater route clean. As per the guidelines given by Mahatma Gandhi National Council of Rural Education (MGNCRE) the following computations and data are necessary for this.

- a. Area of the Campus Land: 4.2 Acers
- b. Institution’s Paved Area: Nil
- c. Institution’s Unpaved Area: 3.65 Acers

Annual Rainfall (mm) = Area of the Institution’s Land x Annual rainfall in metres
 Rainwater that can be harvested in an area can be arrived at by the following calculations:

i. Paved Area =
 $Paved\ Area\ (m^2) \times Vol.\ of\ Rain\ (mm) \times 0.85\ (Runoff\ Coefficient)$

ii. Unpaved Area
 $= Paved\ Area\ (m^2) \times Vol.\ of\ Rain\ (mm) \times 0.35\ (Runoff\ Coefficient)$

$$Quantity\ of\ Rain\ Water\ harvested\ \left(\frac{liter}{annum}\right) = i + ii$$

Table No. 3.5 Area for surface water harvesting potential of Arts and Commerce College, Khedgaon

Sr.No.	Type of Area	Area in Sq.M.	Rainwater harvesting potential (liters)	Total rainwater harvesting Potential
1.	Total Paved Area	-	Nil	3143580 liters
2.	Total Unpaved Area	14797	3143580	

Table No. 3.6 Surface water harvesting potential of Arts and Commerce College, Khedgaon

Sr. No.	Months	Total Unpaved Area (Sq. meters)	Relief Coefficient for unpaved area	Rainfall (mm)	Total Water Available for Harvesting (Litres)
13	Jan	14796	0.35	0.6	3107
14	Feb	14796	0.35	0.4	2071
15	Mar	14796	0.35	0.8	4143
16	Apr	14796	0.35	10	51786
17	May	14796	0.35	18	93215
18	Jun	14796	0.35	90	466074
19	Jul	14796	0.35	138	714647
20	Aug	14796	0.35	118	611075
21	Sep	14796	0.35	150	776790
22	Oct	14796	0.35	54	279644
23	Nov	14796	0.35	23	119108
24	Dec	14796	0.35	13	67322

The table above displays the possibilities for rainwater collection on the unpaved surface area of the college campus per month. Because the campus has a flat unpaved surface area, the drainage coefficient of rain water is 0.35, allowing for the harvesting of 35% of it. Based on this runoff coefficient and a surface area of 14976 square metres, a volume of 2071 litres of water can be collected in the driest months (February) and 776790 litres in the wettest months (August) (September). According to the slope of the land, the college must construct a storm drain that will transport rainfall to a rainwater harvesting pit.

A suitable filtration system is necessary for better recharge. The classic sand bed filter uses coarse riverbed sand, pebbles, and rocks stacked one on top of the other in a limited masonry construction. Rainwater from one end is allowed at the top, while filtered water is retrieved from the other.

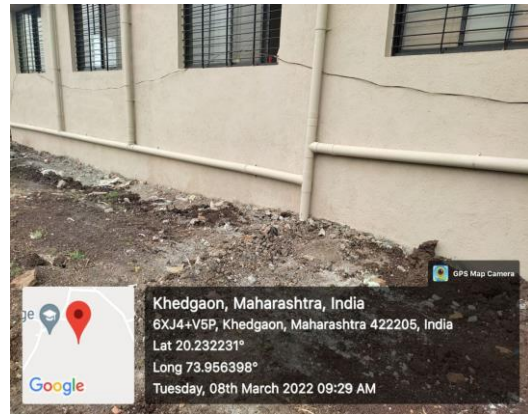


Figure 6 Picture showing rainwater harvesting pit and pipe coming through rooftop



Figure 7 Design of Rainwater harvesting pit

3.2 AIR ENVIRONMENT:

Air pollution has long term and short term impact on the biotic and abiotic component of the environment. Air pollution sources for rural areas are vehicular activities and domestic firewood burning, fuel burning etc. The major pollutants released in the atmosphere are PM₁₀, PM_{2.5}, SO₂, and NO_x, CO etc.

PM₁₀ are inhalable pollutant particles with a diameter less than 10 µm but larger than 2.5 µm which may deposit in air and causes health issues like eye and throat irritation, coughing or difficulty breathing, and aggravated asthma. While PM_{2.5} are inhalable pollutant particles with a diameter less than 2.5 µm that can enter the lungs and circulatory system which may cause severe impacts are on the lungs and heart. SO₂ can cause irritation in the throat and eyes, as well as worsen asthma and chronic bronchitis. Significant quantities of NO_x in the air increase the risk of respiratory illnesses. CO is a colourless gas that can trigger migraines, nausea, consciousness, and vomiting when inhaled at excessive quantities. As per the data from the IMD department the air quality status of Khedgaon is shown in table no. 3.5

Table No. 3.7 Air Quality Status of Khedgaon

Sr. No.	Parameter	Result	NAAQS Standards
1.	PM ₁₀	66	200
2.	PM _{2.5}	63	100
3.	SO _x	10	80
4.	NO _x	4.0	80
5.	CO	1.0	4.0 mg/m ³

*All parameters shows in µg/m³

Source: IMD department

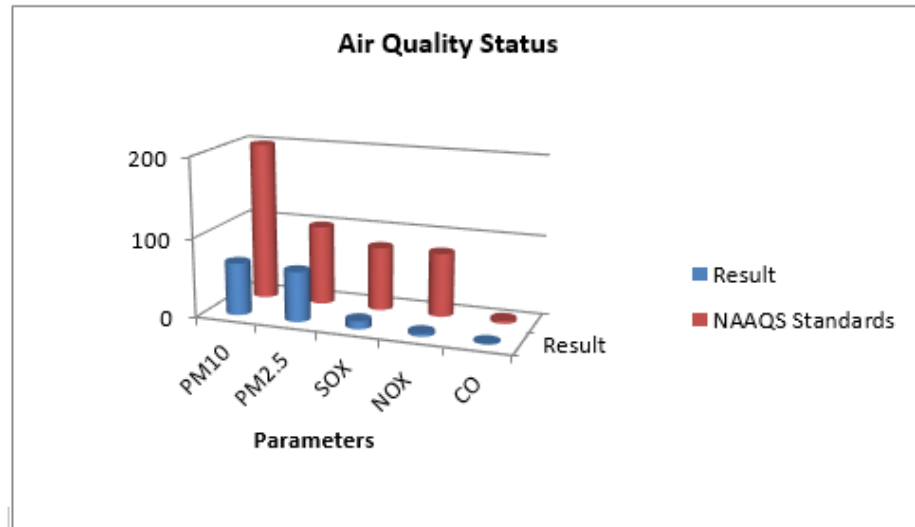


Figure No. 8 Air Quality Status of Khedgaon

All of the air quality parameters were found within NAAQS standards. The air quality is good in nearby areas of the college because surrounding area of the college campus is rural zone and mostly farm field.

3.3 NOISE ENVIRONMENT:

Sound pressure level (SPL) measurements were automatically recorded with the help of an Integrated Sound Level Meter. The noise levels measurements were carried out using noise level meter.. The major source of noise identified in the study area has been predominantly the vehicular movement and the transportation activities. There is no industrial or commercial zone nearby college. Therefore noise level survey was carried out at seven locations within the college campus.

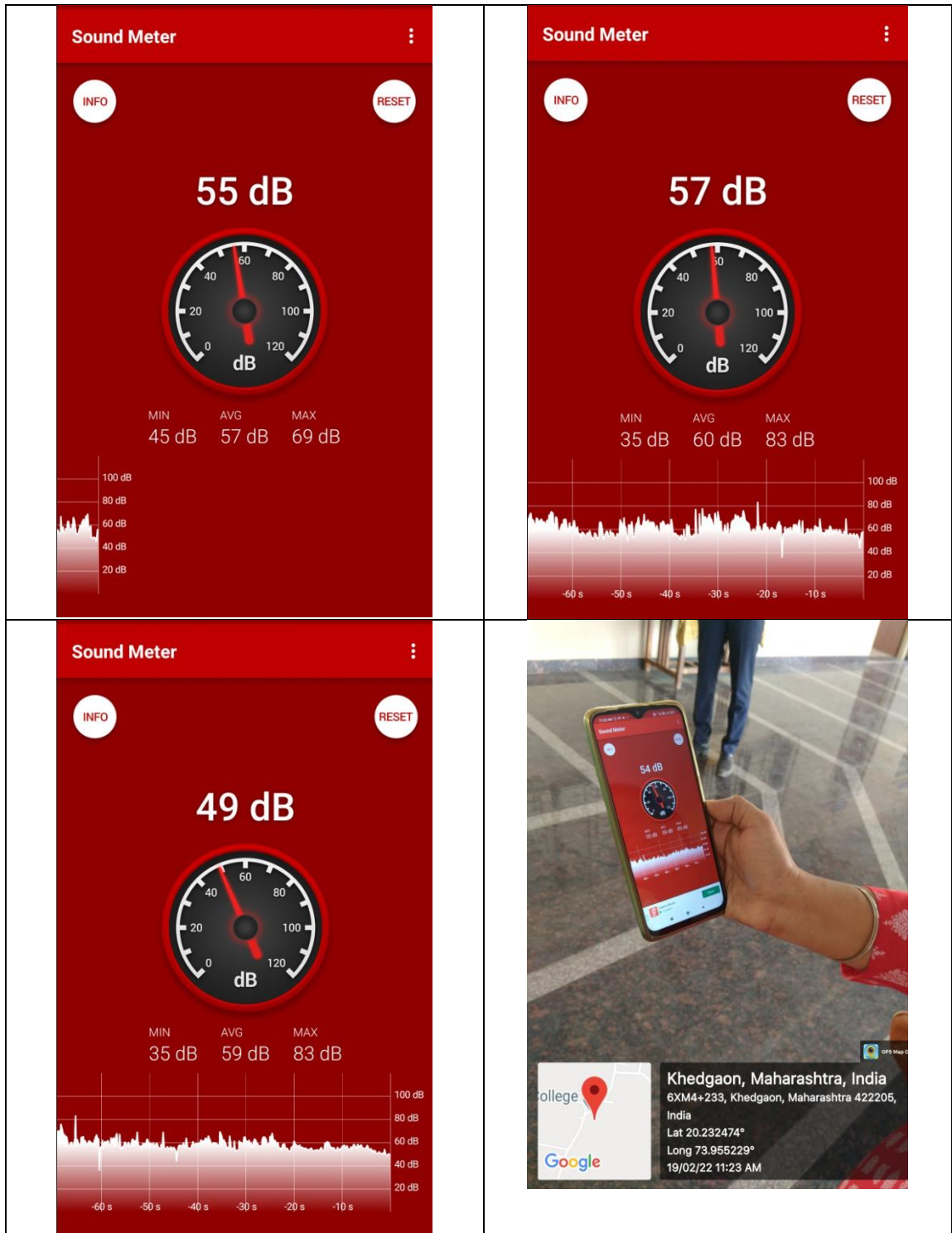


Figure No. 9 Noise Monitoring Photographs

Table No. 3.8 Noise Monitoring Results in the College Campus

Locations	Leq dB(A) Minimum	Leq dB(A) Maximum	Leq dB(A) Average	Limit dB(A)
Main gate	45	69	57	50
Campus	35	83	60	50
Corridor	35	83	59	50
Admin Office	35	65	50	50
Staff Room	45	75	60	50
First Floor Classroom	45	80	48	50
Second floor corridor	35	83	59	50

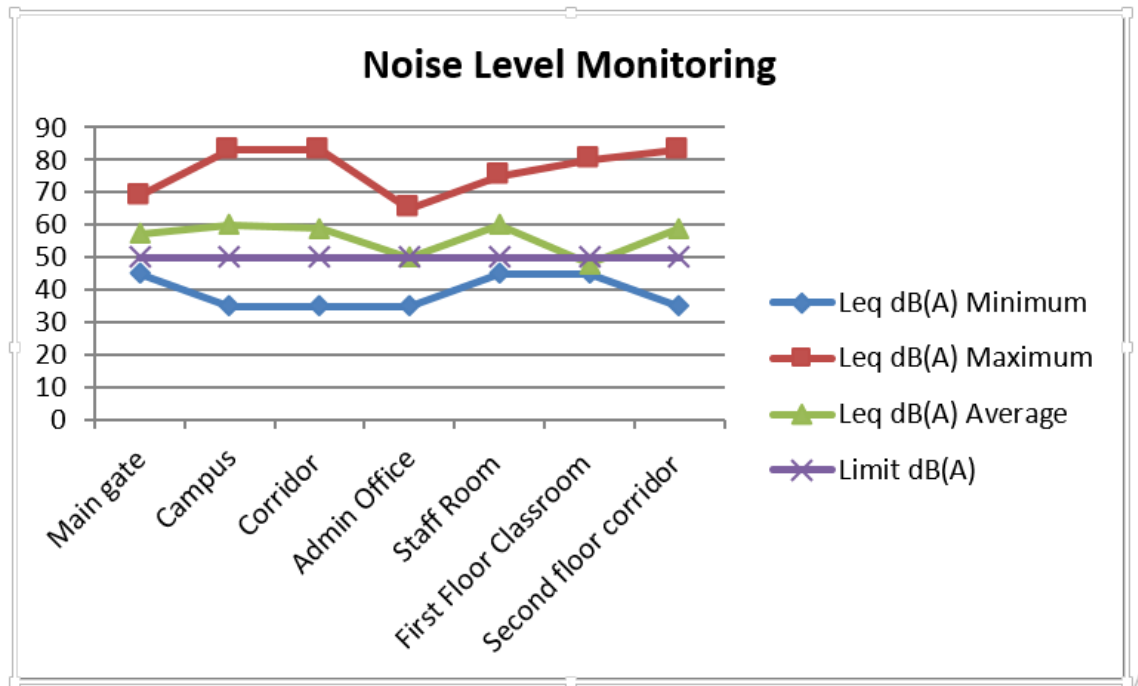


Figure No. 10 Noise Level Monitoring

From the noise monitoring survey it was observed that the noise levels were observed in the range of 35 - 83 dB(A) that shows the values confirming to the prescribed standards.

3.4 SOLID WASTE MANAGEMENT:

Solid waste generation and management has become a most emerging issue in recent years. The rate of solid waste generation is extremely significant, while in other side there is lack of adequate technologies to manage the garbage generated. All garbage other than liquid waste is classified as solid waste. If solid trash is not properly disposed of, it can cause serious health problems as well as an unpleasant living environment. As a result, it is critical to manage solid waste in proper way to lessen the pressure on waste management systems. The goal of this inventory is to determine the amount, volume, type, and present management practise of solid waste generated in MVP's Arts and Commerce College at Khedgaon. This study will aid in the continued management of solid waste and enhance the beauty of campus in terms of green cover.

Table No. 3.9 Quantity of solid waste generation:

Sr. No.	Location	Quantity of Biodegradable waste (kg/day)	Quantity of Recyclable waste (kg/day)	Construction waste (kg/day)	Quantity of Hazardous waste (kg/day)	Quantity of E-waste (kg/day)
1	Classrooms	--	8	Approx. 5 kg/day only during construction period	--	--
2	College Canteen	-- canteen is under construction	--		--	--
3	Lecture Halls	--	8		--	--
4	College campus	27	2		--	--
		27	18	5	--	--

(Solid waste quantification is calculated as per CPCB norms)

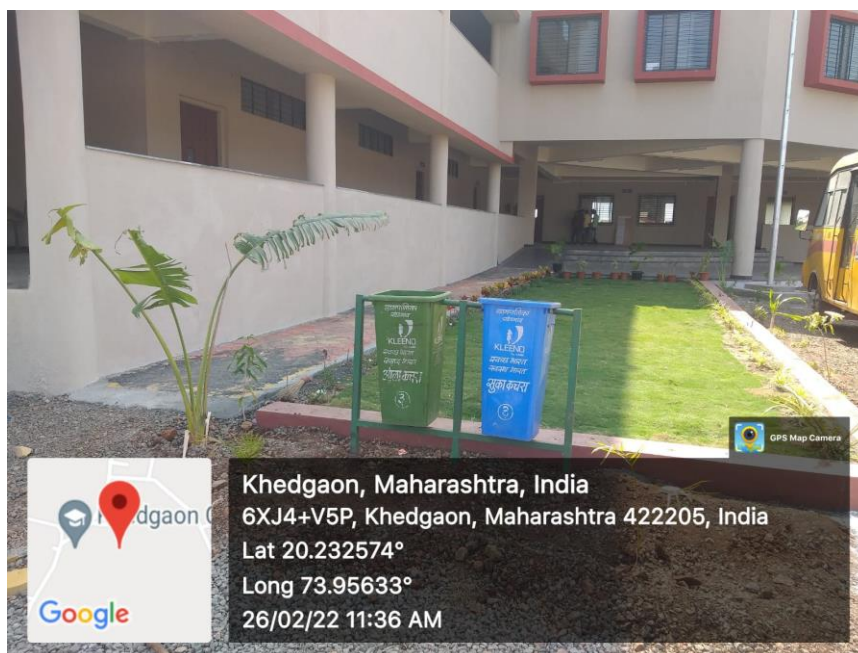


Photo No. 11 Segregation of Solid Waste

A. Segregation of Solid Waste :

Table No. 3.10 Segregation of the Solid Waste

Sr. No.	Specification (Y/N)	Quantity generated (kg/day)	Recycled (Y/N)	Reuse (Y/N)	Other(specify)
1.	Paper	5	Yes	Yes	--
2.	Cardboard	4	Yes	Yes	--
3.	Plastic	2	Yes	No	Sold to authorized vendors
4.	Food waste	--	--	--	Currently canteen is under construction
5.	E Waste	--			Building is new, no significant E waste is generated
6.	Hazardous waste	--	--	--	No Laboratory, No chemicals used
7.	Glass	2	Yes	No	Sold to authorized vendors
8.	Metals	5	Yes	No	Sold to authorized vendors
9.	Biodegradable waste	27	No	No	Building is new, vermi-composting plan is proposed

10.	Construction waste	5	No	Yes	Only during construction period
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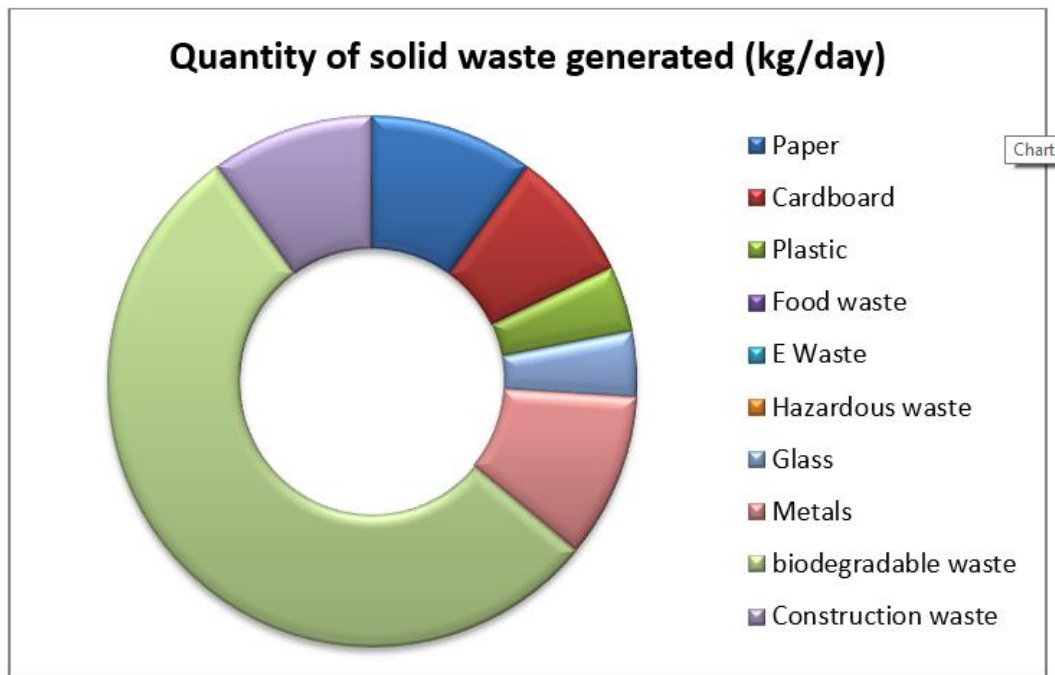


Figure No. 12 Chart for the classification of the solid waste generated

As per the analysis of the above data average solid waste generation within the college campus is 45 kg/day. Out of which the biodegradable solid waste 27 kg/day generated from the plant parts, dry leaves. At present our canteen is under construction. After its completion we will install the vermicomposting unit for disposal of the biodegradable waste. So at this stage we are using facility of ghantagadi as per the need. About 18 kg/day non- biodegradable solid waste generated in the form of paper, cardboard, plastic, glass and metal, etc. We reuse some part of this waste and rest waste we are selling to an authorized vendors. Approximately 5kg/day construction waste is generated and same is used within campus area for levelling of ground.

B. Hazardous Waste:

A hazardous waste is the waste in any form having "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.

The said college is providing Arts and Commerce faculty which shows zero hazardous waste generation because of absence of chemical laboratories. Also the E waste generation is insignificant at present status.

C. E- Waste:

Schedule II e-waste is formed at the College. E-waste generation is visible in every educational establishment. Especially at the college level, there are fewer devices and instruments in use for administrative and technical reasons. In administration tasks, computers, printers, and Photocopier machines are essential. The wire used for interconnection is usually discarded with the e trash. Similarly, numerous scientific gadgets and equipment from science laboratories degrade over time. These, too, contribute to the e-waste issues.

3.5 Green Cover of College Campus:

Any area with grass, trees, or horticulture is considered a green area. Tree canopy analysis is effective for estimating the amount of green cover in a specific area. The covering generated by the branches and crown of plants or trees is known as canopy cover (green cover). The proportion of a specified area of the ground covered by tree crowns is referred to as green cover. According to the National Mission for Green India (GIM), one of eight missions under the National Action Plan on Climate Change (NAPCC), and previous national forest policy, 33 percent of total accessible land should be covered by vegetation. It will help in the reduction of greenhouse gas emissions because plants and trees are the best carbon sinks. Green cover of the college campus is calculated by using following formula

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

Table No. 3.11 Green Cover Calculations

Sr.NO.	Total Area of Campus (sq. meter)	Total Green Cover (sq. meter)	Percent Green Cover
1.	13800	3650	26.44

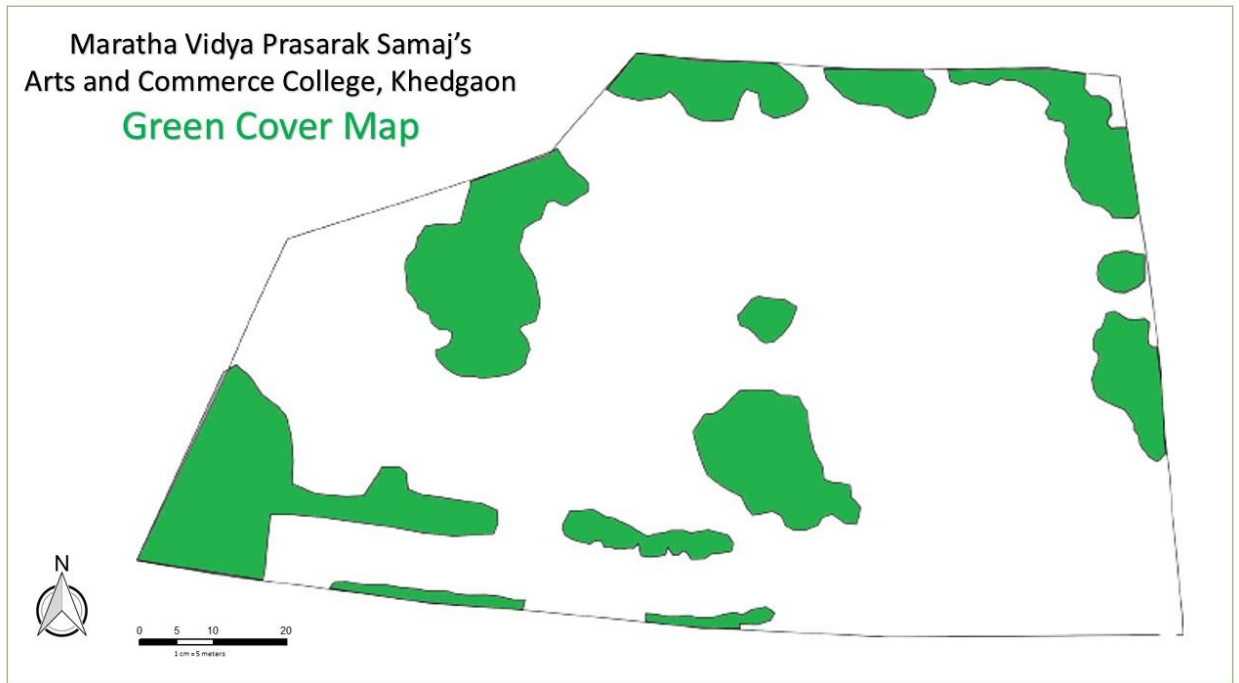


Figure No. 13 Green Cover Map of the College Campus

According to information gathered during the location visit, the college campus has a total area of 16000 square metres. There are roughly 2200 square metres under construction and 13800 square metres of open space available out of the total available. Tree canopies are scanned and the area of each tree canopy is determined using Google Earth Pro. The estimated tree canopy cover is at 3650 square metres, accounting for 24.44 percent of the total open space.



Photo. 14 Green Lawn and Trees on College Campus

Table No. 3.12 List Available trees on college campus

Sr. No.	Local Name	Botanical Name	Family	Number of Plants
1	Jambhul	<i>Syzygium cumini</i>	Myrtaceae	92
2	Silver Oak	<i>Grevillea robusta</i>	Proteaceae.	103
3	Areka Palm	<i>Dypsis lutescens</i>	Arecaceae	4
4	Terminelia Green	<i>Terminalia catappa</i>	Combretaceae	30
5	Tamarind	<i>Tamarindus indica</i>	Fabaceae	5
6	Bamboo	<i>Bambusoideae</i>	Poaceae	2
7	Pimpal	<i>Ficus religiosa</i>	Moraceae	1
			Total	237

Table No. 3.13 List of Common ornamental plants available on college campus

Sr. No.	Common Name	Scientific Name	Family	Number of Plants
1.	Kashmiri Rose	Phyllostachys Aurea	Rosaceae	90
2	Pendanus	Pandanus Amaryllifolius	Pandanus	115
3	Petra	Codiaeum Variegatum	Euphorbiaceae	90
4	Table Palm	Livistona Rotundifolia	Arecaceae	10
5	Dressina	Parthenium Hysterophorusi	Asteraceae	20
6	Shewanti	Chrysanthemum Multifolium.	Asteraceae	10
7	Bentgrass	<i>Agrostis palustris</i>	Poaceae	1800 Sq Ft

4.0 Energy Conservation Practices:

Energy conservation refers to techniques for lowering energy use by eliminating waste and increasing efficiency. We all know that due to the large disparity between demand and supply, a lot of effort is being put in to close the gap in terms of generating more power, which necessitates a lot of capital expenditure and, on top of that, raises a lot of environmental problems. The most important aspect of energy management is energy conservation. We may lower our energy usage by using a variety of energy conservation strategies, such as making better use of technology, use of energy efficient devices and minimizing the wastage of energy.

Table No. 3.14 Floor wise building plan

Floor	Description	Number	Floor	Description	Number
Ground Floor	Principal Cable	1	Second Floor	SWO Room	1
	Administrative Room	1		Language Room	1
	Staff Room	1		Class Room	5
	Gymkhana	1		Psychology Lab.	1
	Class Room	2		Gents Toilet	1
	Ladies Room	1		Ladies Toilet	1
	Gents Toilet	1		Handicapped Toilet	1
	Ladies Toilet	1			
	Handicapped Toilet	1			
First Floor	NSS Room	1			
	Computer & NAAC Room	1			
	Library	1			
	Class Room	4			
	Commerce Lab.	1			
	Gents Toilet	1			
	Ladies Toilet	1			
	Handicapped Toilet	1			

More energy use means more CO₂ emission, which is the primary cause of global warming and climate change. Energy conservation and sustainability in college buildings is therefore crucial and has a high priority on the

government agenda. It is now vital to think about how we use energy, particularly for lighting and cooling in buildings. The Arts and Commerce College, Khedgaon also doing excellent work in energy conservation area. College use energy efficient electrical devices.

Table NO. 3.15 Details of energy efficient electrical equipment's:

Sr. No.	Name	Number
1	LED Tube	171
2	Fan	98
3	Ex. Fan (For toilet)	21

In a month, the average college student uses 24 units of electricity. The Khedgaon college's energy use is relatively low. The college is the most efficient in terms of reducing energy consumption.

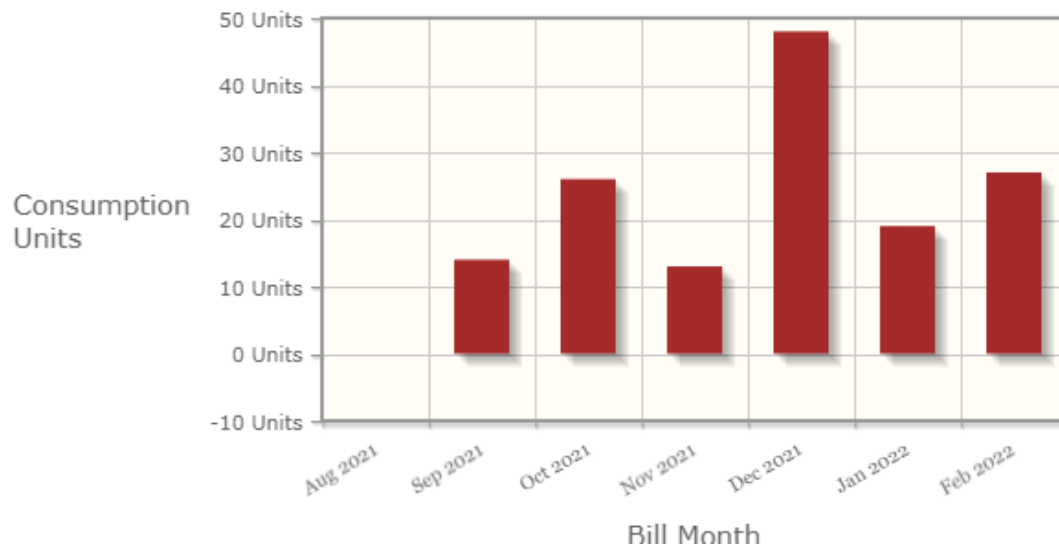


Figure No. 15 Electricity Usage Graph

Use of Solar Street Light:

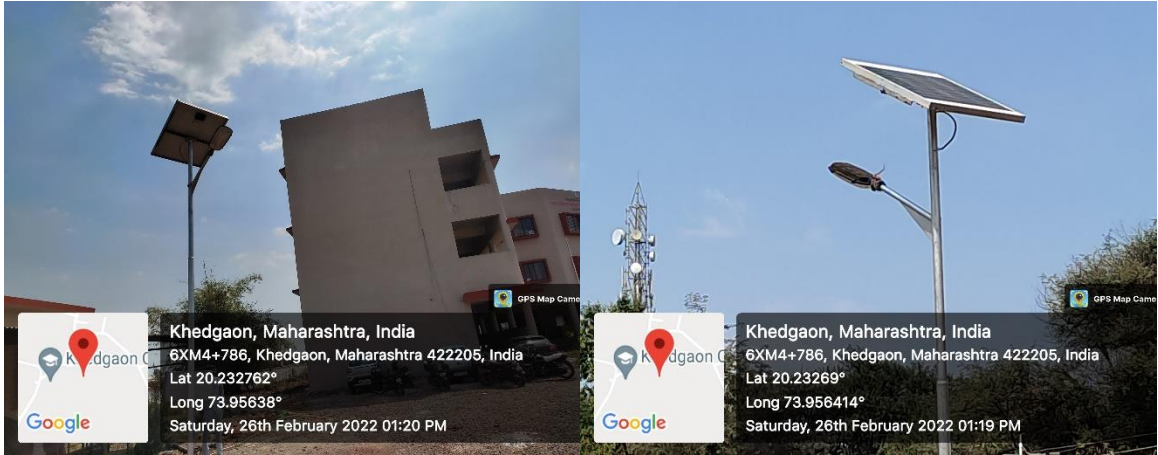


Photo No.16 Photos shown Solar Street Light Installed in College, Campus

Photovoltaic technology is used in solar street lighting systems to convert sunlight into DC power via solar cells. The generated electricity can either be used immediately throughout the day or saved in the batteries for later use. Currently two 18 watt in build solar street light was installed in college campus which provide backup of 12 hours.

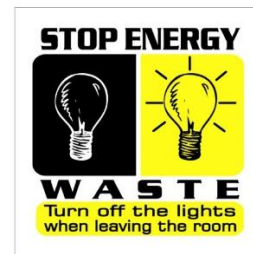


Photo No. 17 Energy conservation signage's displayed on college campus

5.0 Environment Awareness Programs:

Environmental awareness is a critical component of our daily life. To ensure the planet's long-term viability, everyone must commit to becoming more environmentally conscious. As a result of the Supreme Court's decision, environmental education is now become compulsory to all students in all types of higher education institutions. Environmental education is a style of education that allows students to learn through hands-on experiences outside of the classroom. It allows students to relate and apply what they've learned in the classroom to real-world environmental challenges. The Arts and Commerce, College is one of them and many environment friendly programs are organized through the college. These include tree planting, Vruksh Dindi, AIDS Awareness Rally, workshop on Tobacco Free, Health Checkup Camp, etc.

Tree Plantation Activity:



Photo No. 18 Plantation Activities in and Around the College

Every year a large number of Indian plants are planted by the college in the college premises as well as in Khedgaon and surrounding areas. Plantation activities are crucial in reducing global warming due to rising pollution and carbon dioxide emissions. So far more

than 200 trees have been planted in the college premises and they are maintained by drip irrigation. Along with tree planting, colleges also planted a huge number of ornamental plants for the purpose of beautification.

Promotion of Organic Farming through Beekeeping and Polyhouse

Management:



Photo Number 19 Onsite Training and Visit to Baswant Honey Bee Garden



Photo No. 20 Visit to Tryambakraj Narsory

Khedgaon is located in Dindori tehsil and most of the people here depend on agriculture. The area is popularly known of its grape production, especially the black grapes. There is a close relationship between developed farming practices and ecological balance. The increasing use of pesticides in recent times is adversely affecting human health. For this, organic farming is the only type and bee contribution is important. Recognizing the importance of this, the college with the help of Baswant Beekeeping Center organized a beekeeping workshop for the students

In India, polyhouse farming is slowly gaining popularity. Polyhouse farming can be quite profitable for a farmer. However, many people are unaware of polyhouses or greenhouses, so they will learn about polyhouses and their benefits through this post. This year Trimbak Raj Polyhouse was visited by the college for the students to understand the various benefits of Polyhouse. In this, students were given training on how to make and plan different plants using polyhouse.

Field Visit to River Interlinking Project: Manjarpada:

Water scarcity and its aftermath are nothing new to us. Water scarcity is hampering development, shutting down agro-industries and displacing large numbers of people. Water causes disputes between districts and then between states. Maharashtra Gujarat is not spared from this. Problems arising in Maharashtra The water of small and big rivers is diverted to Gujarat. To know the importance of the river connection project, the college student visited the Manjarpada project and studied various things there.



Photo No. 21 Visit to Manjarpada River Linking Project

Activities through NSS:

One of the important services that can be rendered by NSS volunteers is disseminating information about the latest developments in agriculture, watershed management, wastelands development, non-conventional energy, low cost housing, sanitation, nutrition and personal hygiene, schemes for skill development, income generation, government schemes such as Swachh Bharat, Ayushman Bharat, Accessible India, Digital India, Beti Bachao and Beti Padhao, Environment and Energy Conservation and Education, legal aid, consumer protection and allied field.

Through NSS unit, many works like cleaning of colleges campus, cleaning campaign in villages, organization of various eco-friendly programs in selected villages, construction of CCT for water conservation, construction of bunds for water conservation and water reclamation campaign etc.

The students work for overall development of the adopted village through activities like tree plantation, Continuous Contour Trenches, Gram Swachhata, socio-economic survey of the village, Save Girl Child campaign etc. CCTs, Water Conservation work is done by NSS volunteers.



Photo No. 22 Tree Plantation Activity by NSS Volunteers



Photo No. 23 Construction of Contour Trenching and Making of Earthen Bunds



Photo NO. 24 Cleanliness Campion



Photo No. 25 Disaster Management Workshop



Photo No. 26 Yoga Day



Photo NO. 38 Street Play



Photo No. 39 Nirphay Kanya Aabhiyan



Photo No. 38 Aids Awareness



Photo No. 30 Awareness through Vruksh Dindi

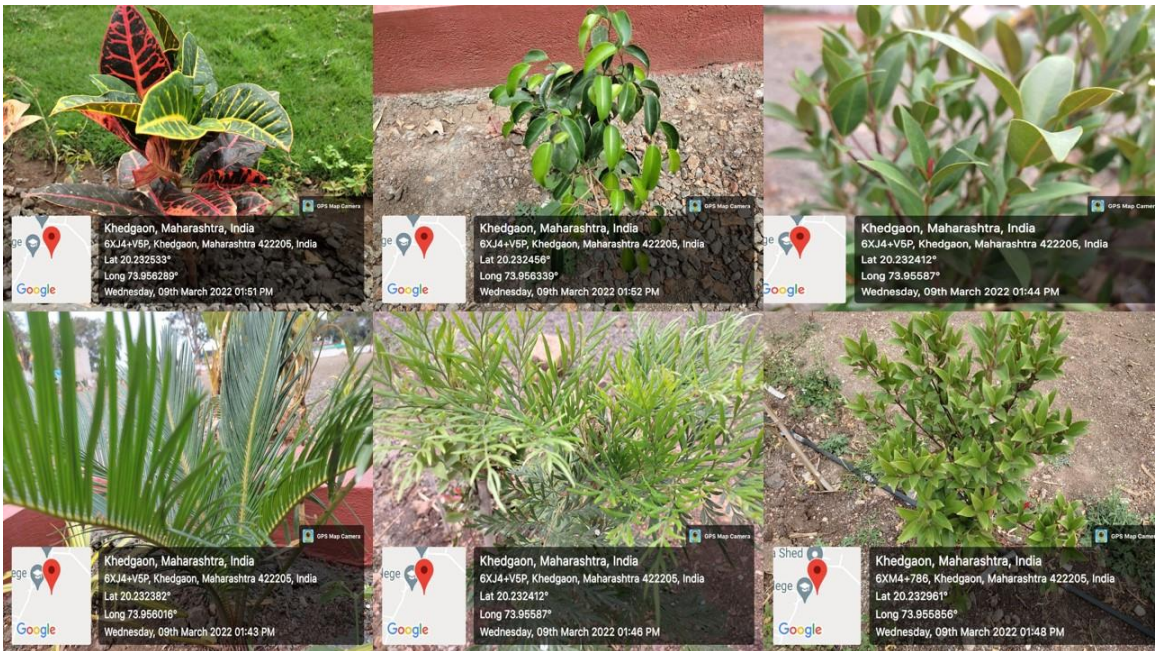


Photo No. 31 Shows Photos of some ornamental plants planted on campus

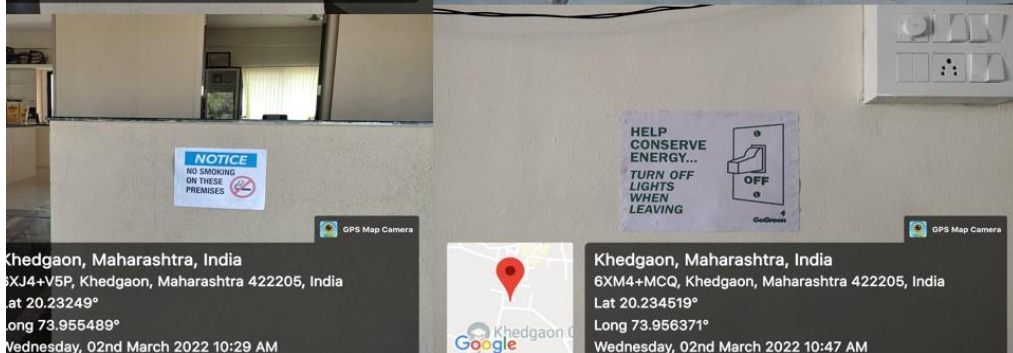
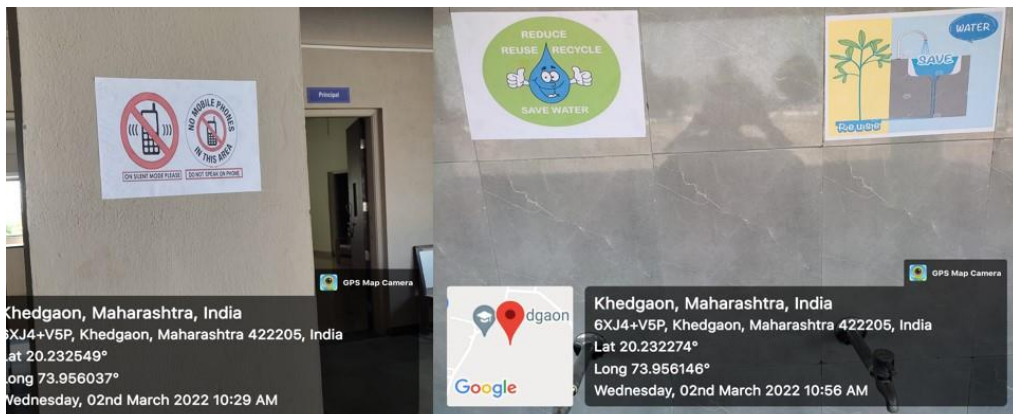


Photo No. 32 Environment Related Signage's Displayed on Walls

सायकल चालविण्याचे फायदे:

- ✓ हृदय व रक्तवाहिन्यासंबंधी तंदुरुस्ती वाढते.
- ✓ वाढलेली स्नायू शक्ती आणि लवचिकता वाढते.
- ✓ मणक्याचे विकार व पाठदुखी कमी होते.
- ✓ मेंदूची कार्यक्षमता वाढते
- ✓ तणाव पातळी, चिंता आणि नैराश्य कमी होते.
- ✓ शरीरातील चरबीचे प्रमाण कमी होते व हाडे मजबूत होते.
- ✓ वाढलेले वजन, अयोग्य आहार, व्यायामाचा अभाव यांमुळे होणाऱ्या मधुमेहाचा धोका दररोज सायकलच्या व्यायामाने कमी होऊ शकतो. याशिवाय नियमित सायकलिंगमुळे कर्करोग टाळता येऊ शकतो.
- ✓ सायकलिंगसाठी पेट्रोल-डिझेल यासारख्या इंधनाची गरज नसते त्यामुळे इंधनाची मागणी कमी होऊन आखाती देशात जाणारा इंधनासाठी जाणारा राष्ट्रीय पैसा वाचण्यास मदत होते.
- ✓ सायकल चालवण्यामुळे पर्यावरणाचे रक्षण होते. कारण सायकलिंगसाठी इंधन लागत नसल्याने हवेचे प्रदूषण होत नाही.
- ✓ आर्थिक बचत होते.

जनहितार्थ प्रकाशित

कला आणि वाणिज्य महाविद्यालय खेडगाव,
ता. दिंडोरी, जि. नाशिक, 422205



Khedgaon, Maharashtra, India

6XJ4+V5P, Khedgaon, Maharashtra 422205, India

Lat 20.232623°

Long 73.956362°

Wednesday, 02nd March 2022 10:41 AM

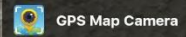


Photo No. 33 Display Board Explaining Benefits of a Cycling

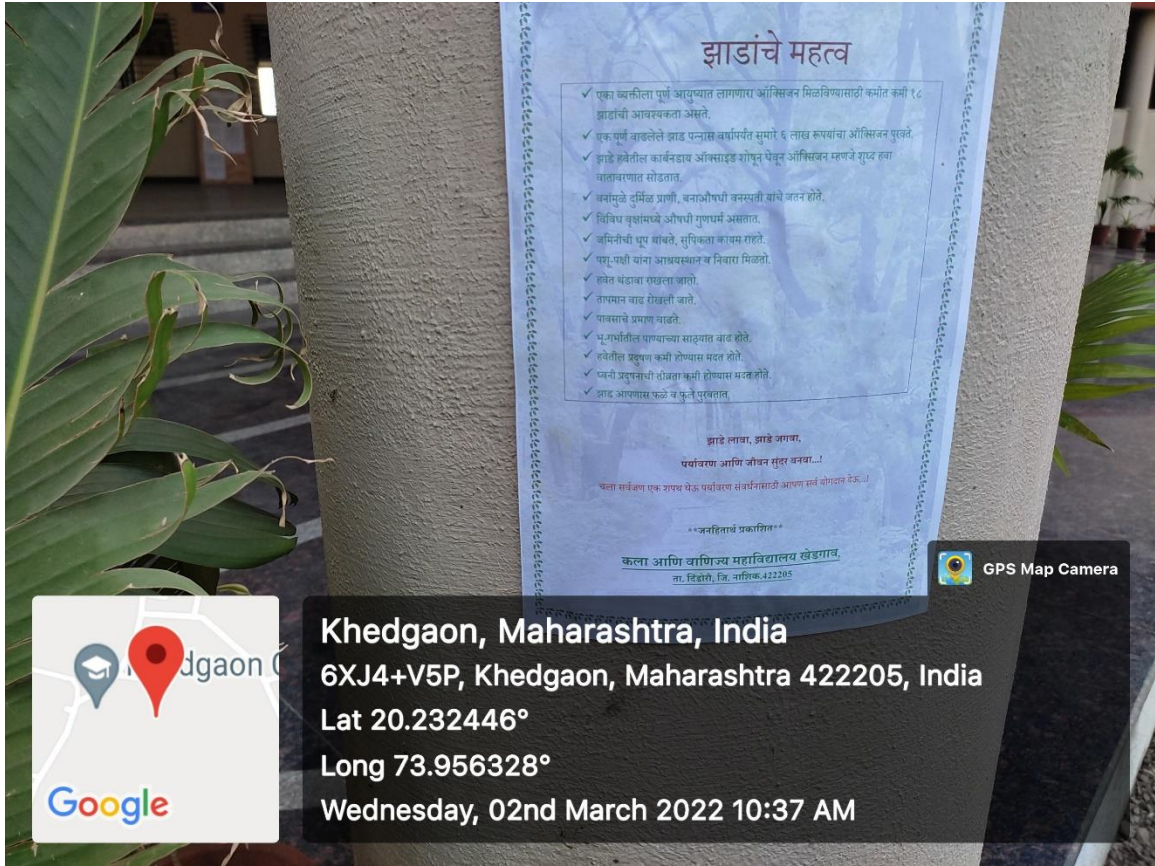


Photo No. 34 Display Board Explaining Benefits of a Tree

Health Awareness and Management:



Photo No. 35 Participation of Students in Hemoglobin and Heart Disease Checking Camp.

The process of assisting people to gain more control over and improve their health is known as health promotion. Within the sphere of disease prevention, this branch of public health is becoming increasingly important. The purpose of this study is to investigate the current state of health promotion activities at Khedgaon College throughout the academic year.

The college installs a sanitary pad vending machine in the girls' room. As the Corona situation worsens, the college maintains a sanitization programme. Every day, office personnel checks the temperature of students entering the college, and sanitizers are available in front of the college. Each pupil cleans their hands.



Photo No. 36 Sanitary Pad Vending Machine installed in Girls Rooms



Photo No. 37 Provided sanitization facility for Students.

Awards and Achievement:



Photo No. 38 College Received Achievement Award For their Work in Tobacco Control



Photo No. 39 Special Award Given by Dhondgavhan Grampanchayat for Conductive Various Activities are Dhondgavhan Village



Certificate

This is to certify that
**MARATHA VIDYA PRASARAK SAMAJ'S
ARTS & COMMERCE COLLEGE, KHEDGAON**

TAL:-DINDORI, DIST.-NASHIK,
MAHARASHTRA-422205, INDIA

has been found in Compliance with requirements of
Quality Management System
ISO 9001:2015

for the following scope:

PROVIDING HIGHER EDUCATION TO STUDENTS.

Certificate No. : 6682/QMS/0920
Issue Date : 08-September-2020
Expiry Date : 07-September-2023

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Photo No. 40 ISO 9001: 2015 for Quality Management System

6.0 Conclusion and Recommendations

The Green Audit of MVP's Arts and Commerce College, Khedgaon is conducted in Academic year 2020- 2021. The process of discovering and determining if an institution's operations are environmentally friendly and sustainable is known as green audits. The key objective of the college's green audit is to evaluate the college's green initiatives and execute a well-structured audit to determine at which we stand on a grade of environmental sanity.

6.1 Conclusion

During the process of green audit and from observations some of the conclusions are made as follows:

1. College building is under construction at this stage. College takes efforts to dispose majority waste by following recycling and reuse practices.
2. Sufficient Water supply to the college comes from the well by the Grampanchayat, Khedgaon. Roof top rainwater harvesting technology will be used for water conservation.
3. Toilets and bathrooms are new and without any leakages.
4. Toilets and bathrooms wastewater is treated in soak pits and septic tanks.
5. Air quality on the campus is found good.
6. Noise level monitoring is done at different locations within the campus. Noise level observed within the prescribed standards as the college is situated in rural area and campus is surrounded by agricultural field.
7. Plastic waste, paper waste as well as glass waste is disposed properly. Sometimes ghantagadi facility is being used when necessary.
8. No hazardous waste is generated in the college because it runs courses comes under Arts and Commerce stream. E waste is also insignificant as there are no major uses of the laboratories and equipments. E-waste segregation, handling and disposal are properly done.
9. Sufficient ventilation is available in the college building, in classrooms, in staffrooms, in library, in seminar hall and many more. Electricity is minimized by using LED lights and solar panel for campus and street lights. These practices help in energy conservation

10. and functioning properly.

6.2 Recommendations

Following are some recommendations for improving environment friendly practices within the campus.

1. Using the criteria in the Green Audit document, the college should design environmental guidelines.
2. Drinking water quality is assessed and found that the water is not potable for direct use drinking purpose. College has to take immediate action and install water purification system.
3. Pipe leaks and corrosion, as well as overhead tanks, must be addressed as soon as possible.
4. Data on all measured environmental factors should be monitored and recorded on a regular basis, and information should be made available to management.
5. The college should adopt internal procedures to guarantee that it complies with environmental standards, and responsibility for implementing them into action should be appointed.
6. Canteen in the college is under construction, hence at present there is no any kitchen waste is generated. After operation of canteen, management of college will plan to provide the vermin-composting facility for the disposal of canteen waste and biodegradable solid waste is generated from the tree and plants. Waste should be reused or recycled whenever possible.
7. More Solar Panels should be installed to achieve energy conservation.