

Green Audit



नियन्त कुरु कर्म त्वम्

(Do the work assigned to you)

MAHATAM PHULE SHIKASHAN SANSTHA.



**KARMAVEER BHAURAO PATIL COLLEGE
ISLAMPUR**

Introduction

A Green Audit for Environmental Protection:

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. The purpose of Green auditing is to assess periodically the compliance of completed or on-going activities with the requirements of legislation, measures proposed in environmental policies, environmental management systems and environmental schemes or the provisions of standards and contracts.

B Benefits of Green Audit:

- Ensuring legislative compliance.
- Reducing environmental impacts.
- Reducing waste, water and energy costs.
- To safeguard the environment and natural resources.
- Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and green campus.
- Finally, it will help to built positive impression for the upcoming NAAC visit.

C NAAC criteria VII Environmental Consciousness:

Green Audit is assigned to the criterion VII of NAAC. National Assessment and Accreditation Council which is a self-governing organization that declares the institutions as Grade A , Grade B or Grade C according to the scores assigned at the time of accreditation of the institution. The intention of green audit is to upgrade the environmental condition in and around the institution. It is performed by considering some environmental parameters like water and wastewater management, energy conservation, waste management, air monitoring, etc. for making the institution more eco-friendly.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring nature in students. Many environmental activities like plantation and nurturing saplings and trees, cleanliness drives, bird watching camp, no vehicle day, rain water harvesting visits to ecologically important places through green clubs will make the student a good citizen of country.

D Profile of Mahatma Phule Shikshan Sanstha:



Mahatma Phule Shikshan Sanstha.

Mahatma Phule Shikshan Sanstha, Uran-Islampur was established by the group of Teachers who were much impressed by social reformers like Mahatma Phule, Rajashi Shahu Maharaj, Maharshi Vithal Shinde, Karmaveer Bhaurao Patil and Dr. Babasaheb Ambedkar. They decided to open the channels of education from primary to higher education to the common masses under the vibrant and studies leadership of late Dr. N.D. Patil.

Late Dr. N.D. Patil

He is an eminent thinker and prominent leader in educational, social, economical and political fields in Maharashtra. He has been working last sixty years in various movements which aim at enlightenment of the weaker sections of the society. He has also been working for Rayat Shikshan Sanstha, Satara. Which is 'Mother Institution' and put this name at par excellence after Karmaveer Bhaurao Patil? Considering his over all contribution, Swami Ramanand thirth University, Dr. Babsaheb Ambedkar Marathwada University and Shivaji University conferred him D.Lit. Today the institution is one of the leading institutions in south Maharashtra, since 55 years, the institution has been showing quality performance in its academic progress.

COLLEGE PROFILE IN BRIEF

NAME OF THE COLLEGE: **Karmaveer Bhaurao Patil Collge, Islampur**

ESTABLISHMENT : **1961**

PIONEERS : **Late Shri. N.D. Patil.**



Karmaveer Bhaurao Patil College, consist of 03 big buildings, is situated in heart of the city with necessary infrastructure for the departments of all the faculties. A proper care is taken to provide basic amenities for the students & the staff members. The facilities are as follows.

- **Classroom:** 26 spacious classrooms with necessary furniture & blackboards in 3 buildings of the college.
- **Library:** The library of the college is big stored independent building with more than 80 thousand books & 01 study rooms with separate girls and boy's allocations.
- **Laboratory:** 22 spacious laboratories with Computers with Battery backup, Printer, Scanner, LCD projectors & equipment's & furniture etc. In the departments of Physics, Chemistry, Botany, Geography, B.C.A, commerce. (computer labs with modern technology in spacious hall)
- **Administrative Office:** The spacious LAN computerized administrative office with modern technology & with necessary facilities.
- **Toilet:** 02 Toilets for gents & 02 toilets for ladies.
- **Open Air Theatre:** An open air theatre with Paving Block, Tiles & stage is used for the big functions.
- **Conference Hall:** Independent conference hall with necessary facilities for different activities of the departments.
- **Study Room:** In the library building one study room for students & one study room for boys students. Both the study rooms are spacious & necessary furniture & facilities, drinking water, etc.
- **Canteen:** One canteen in the campus providing tea & snacks.
- **Hostel:** Girls' hostel with facility of rooms with beds, canteen, T.V., Study Room with newspapers. Capacity of 100 girl's students.

Methodology

The college has conducted Green Audit in the year 2021/2022, on a yearly basis. The audit was carried out in three phases.

a. Questionnaire survey:

It includes administrative issues associated with the planning of audit, selecting the personnel for the audit team, preparing the audit protocol used by organization, obtaining background information, etc. The scope of the audit was defined at this step. It was decided that the information related to Water and Wastewater management, Energy conservation, Green belt, Carbon inventory, Solid waste management, Hazardous waste management, Air and noise quality status, activities of nature club, etc. should be gathered for the audit purpose. For collecting data related to these different areas, specific questionnaires were prepared.

b. Onsite visit and observations:

The data related to above mentioned areas was collected by visiting each and every facility of college campus. The questionnaires were filled up according to the present situation. Photographic documentation was also done with the help of sophisticated camera.

c. Data analysis:

After collection of secondary data, the reviews related to each environmental factor were taken by the green audit team. The data was tabulated, analyzed and graphs were prepared using computer. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. The Environmental Management Plan (EMP) was prepared for the next academic year in order to have better environmental sensitization. Finally, all the information was compiled in the form of Green Audit Report.

Environmental Auditing Process

Planning



Choosing Audit Team



Collection of Data



Analyzing Results of Audit



Evaluating Audit

Overview of Green Audit

a. Profile of Karmaveer Bhaurao Patil College Islampur. :

Karmaveer Bhaurao Patil College, Islampur is situated in Maharashtra at **17°03'25.67"N 74°16'81.98"E**, in the Sangli District and it is at altitude of 498 fts above mean sea level.

Satellite image of Karmaveer Bhaurao Patil College Campus



Source: Google Earth

A) Entrance

B) College Main Building

C) Parking

D) Library

E) Play Ground

F) Girls Hostel

G) Academy

H) Office

I) Department

Latitude: 17°03'25.67"N

Longitude: 74°16'81.98"E

Sr.	Particular	Content		
1.	Name of the project	“KARMAVEER BHAURAO PATIL COLLEGE ISLAMPUR”		
		Name	Karmaveer Bhaurao Patil college Islampur.	
		Address	Bahe Road, Urun-Islampur, Tahsil-Walwa Dist. - Sangli Pin-415409	
		Telephone	02342-221778	
		Email ID	kbpislampur@gmail.com	
		Name	Natural Solution Environmental Services	
		Address	Islampur Dist.:- Sangli	
		Registration No.	MH29D0037743	
		GSTIN	27ABYPI4809G1Z8	
		Mobile	09860437123	
		Email ID	naturalsolution3@gmail.com	
4.	Type of project:	Educational		
5.	Location of the project	Bahe Road, Urun-Islampur, Tahsil-Walwa Dist. - Sangli Pin-415409		
6.	Whether in Corporation/ Municipal / other area	Urun Islampur Municipal Corporation		
		Sr. No. 1062		Sq. m
		Sr. No. 1061		Sq. m
		Total		Sq. m
				Sq. m
				Sq. m
				Sq. m
10.	Ground-coverage percentage (%) (Note: Percentage of plot not open to sky)			
11.	Height of the building	12 to 15 meter		

b. Water and Wastewater Audit:

Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses and thus enabling considerable conservation of water in irrigation sector, domestic, power and industrial as well. A water audit is a technique or method which makes possible to identify ways of conserving water by determining any inefficiencies in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

Water accounting is the process of communicating water resources related information and the services generated from consumptive use in a geographical domain, such as a river basin, a country or a land use class; to users such as policy makers, water authorities, managers, etc.

Importance of Water Audit:

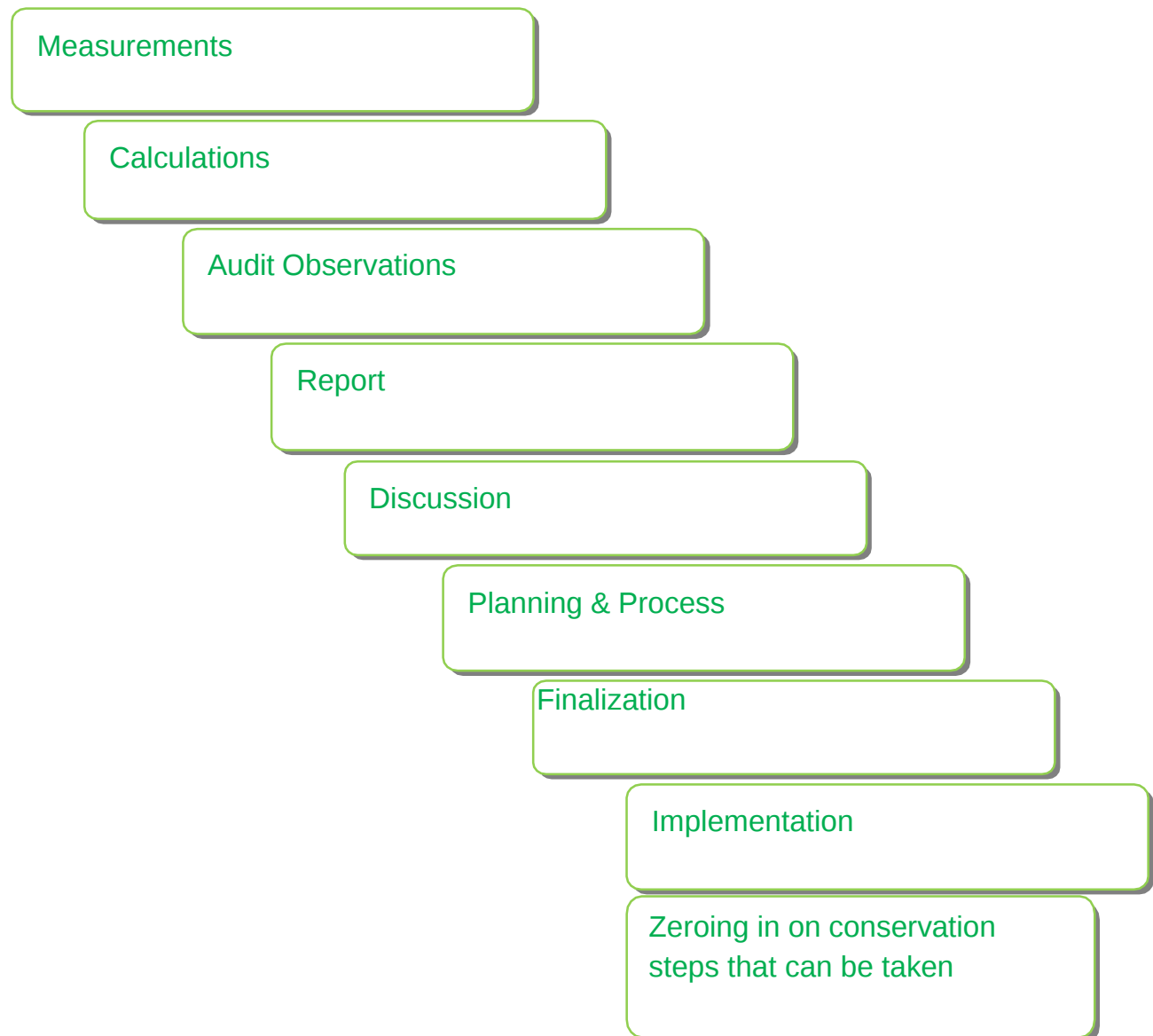
- Water audit improves the knowledge and documentation of the distribution system.
- Identifies the problem and risk areas and a better understanding of what is happening to the water after it leaves the source point.
- Leads to reduced water losses.
- Improved financial performance.
- Improved reliability of supply system.
- Efficient use of existing supplies.
- Better safeguard to public health and property and reduced legal liability. Reduced disruption, thereby improving level of service to customers.
- Large potential cost savings that can be achieved by water harvesting, through therecycling of water and the use of rain water.

It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology determine the requirement of water. The community which has a population between 20,000 to 100,000 requires 100 to 150 liters per person (capita) per day. The communities with a population can consume over 100,000 — 150 to 200 liters person (capita) per day. As per the standards provided by WHO Regional office for South East Asia Schools requires 2 liters per student; 10-15 liters per student if water-flushed toilets, Staff accommodation requires 30 liters per person per day and for sanitation purposes it depends on technology.

C) Water Audit:

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential halls, academic buildings, on campus and on grounds. Wastewater is referred as the water which is transported off the campus. The wastewater includes sewerage, residence, hall waters used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately going down in sink or drainage system.

Water Audit Process:



❖ Overall water consumption in Karmaveer Bhaurao Patil College Islampur:

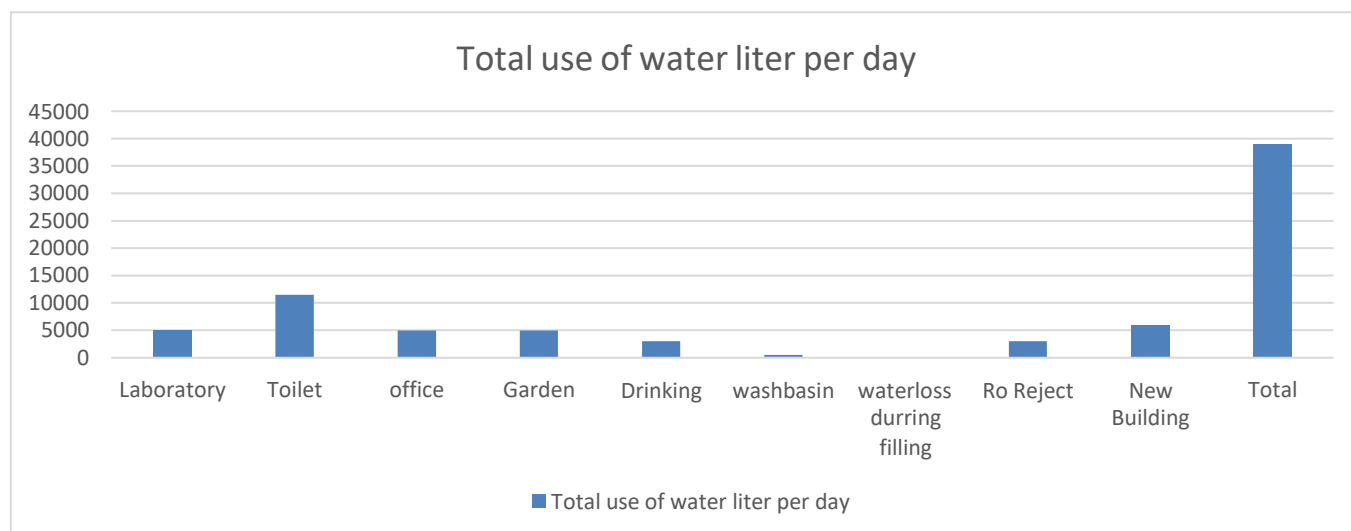
From the data collected for water audit of Karmaveer Bhaurao Patil College, Islampur, the water distribution and water consumption pattern is noticed as follow. The college is having main building for administrative work as well for teaching work. For the water audit purpose we categorized the college campus area into three buildings namely as wing 1 (Main Building and office), Hostel, Academy, Garden.

In water audit study the daily water consumption by all Buildings is found to be as follows.

Daily water consumption by College Campus

Site	Laboratory	Toilet	office	Garden	Drinking	water loss during filling	RO Reject	Washbasin	New Building	Total
Total use of water	5000	11500	5000	5000	3000	50	3000	500	7000	40050
Percentage	12.804097	29.449	12.8041	12.8041	7.68245839	0.128041	7.682	1.2804	16.36492	100

Total use of Water (liter /day)

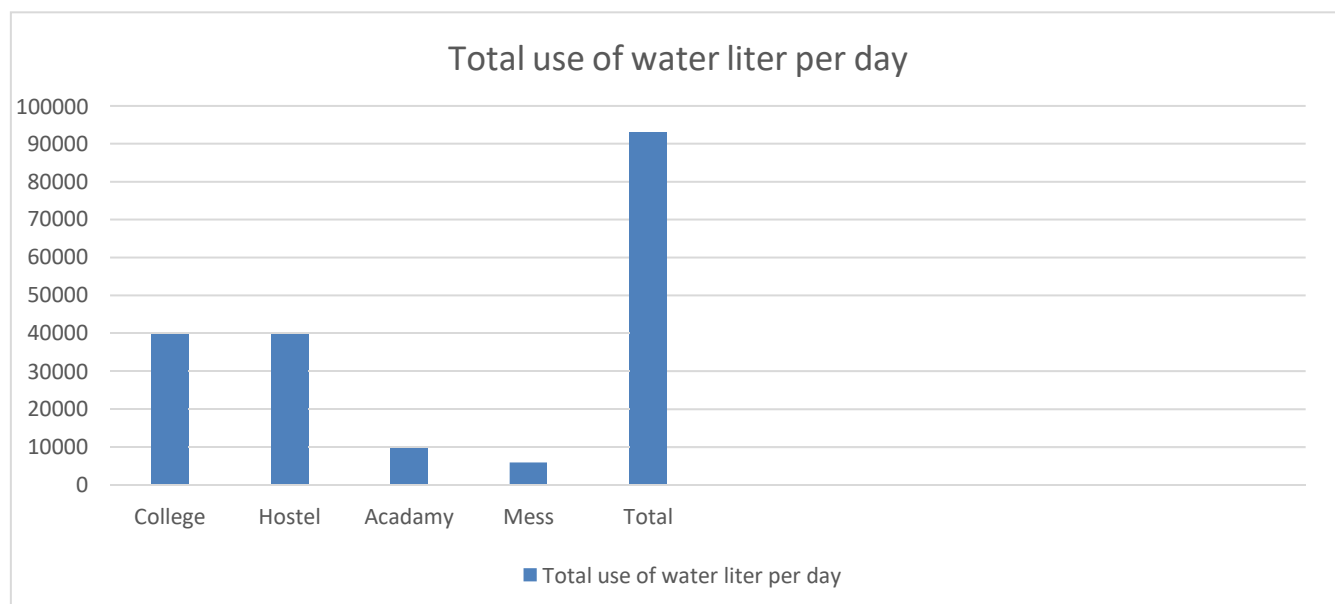


Daily water consumption by all buildings

The total water consumption per day for all buildings is found to be 93050 lit/day.

Daily water consumption by All Buildings

Daily water consumption by All Campus					
Site	College	Hostel	Mess	Academy	Total
Total use of water	39050	38000	6000	10000	93050
Percentage	41.96668	40.83826	6.448146	10.74691	100



D. Total Electric Energy Audit.

An electricity audit is simply an audit or calculation of how much electricity you are using in your home and of where that electricity is going.

An energy audit is an analysis of a facility, indicating how and where that facility can reduce energy consumption and save energy costs. Its insight to energy efficiency and conservation can lead to significant savings on the company's utility.

Importance of Electric energy Audit:

- The audit will not only inform you of opportunities but provide you with financial analysis. This will enable prioritization based on financial benefit and return on investment.
- Provide you with solid, easy to understand technical information regarding the proposed energy conservation measures.
- A good quality audit will analyze your historical energy use and find potential issues using statistical methods.
- Provide you with emissions analysis to help you understand the benefits of your decisions from an environmental standpoint.
- Understand where energy is used and which areas are worth focusing on the most (energy hogs).
- Provide you with benchmark information to help you understand your energy use performance compared to others in your field and area.

Electrical Audit CLASSROOMS											
	LED				LED Tubes	Regular Light	Fan	Exh. Fan	Refreeze	Computer	LED TV
	22 W	15W	50 W	12W	20 W	40 W	70 W	60 W		150 W	0
G1	0	0	0	0	0	4	3	1	0	1	0
G2	0	0	0	1	0	4	5	0	0	0	0
G3 and G4	0	0	0	0	0	13	9	0	0	17	0
G5	0	0	0	4	7	0	9	0	0	1	0
G6	0	0	0	0	7	0	7	0	0	0	0
G7	0	0	0	0	7	0	7	0	0	0	0
G9	0	0	0	0	5	0	5	0	0	0	0
G10	0	0	0	0	5	0	3	0	0	0	0
G11	0	0	0	0	5	0	5	0	0	0	0
F27	0	0	0	1	0	0	1	0	0	0	0
F29	0	0	0	0	7	0	4	0	0	0	0
F30	0	0	0	0	7	0	4	0	0	0	0
F32	0	0	0	0	8	0	4	0	0	0	0
F33	0	0	0	0	8	0	4	0	0	0	0
F34	0	0	0	0	8	0	4	0	0	0	0
F36	0	0	0	0	5	0	4	0	0	0	0
S57	0	0	0	0	7	0	3	0	0	0	0
S58	0	0	0	0	7	0	3	0	0	0	0
S60	0	0	0	0	7	0	4	0	0	0	0
S61	0	0	0	0	7	0	4	0	0	0	0
S62	0	0	0	0	7	0	4	0	0	0	0
S64	0	0	0	0	5	0	3	0	0	0	0
S65	0	0	0	0	5	0	3	0	0	0	0
S66	0	0	0	0	5	0	3	0	0	0	0
Total Watt	0	0	0	6	129	21	105	1	0	19	0
	0	0	0	72	2580	840	7350	60	0	2850	0
Total LED Watt			2652		Total Regular Light					11100	

Eletrical Audit All Department												
	LED				LED Tubes	Regular Light	Fan	Exh. Fan		Refreeze	Computer	LED TV
	22 W	15W	50 W	12W	20 W	40 W	70 W	60 W	746 W	700 W	150 W	200 W
Chemistry	0	0	0	6	0	14		0	4	1	3	0
Physics	0	0	0	0	0	15	6	0	0	0	2	0
Maths	0	0	0	0	4	2	3	0	0	0	13	0
library	0	0	0	0	0	53	20	0	0	0	3	0
Biology	0	0	0	0	0	10	3	0	0	0	1	0
Biotech	0	0	0	0	0	7	1	0	0	2	2	0
Psychology	0	0	0	0	0	12	4	0	0	0	3	0
BCS	0	0	0	0	0	4	5	0	0	0	23	0
Geography	0	0	0	0	0	16	10	0	0	0	12	0
Automobile	0	0	0	0	0	4	2	0	0	0	1	0
Electrical	2	0	0	0	0	11	3	1	0	0	1	0
Electronics	0	0	0	0	0	7	3	0	0	0	1	1
Hindi	0	0	0	0	5	0	3	0	0	0	1	0
Gymkhana	0	0	4	0	1	6	9	1	0	0	1	0
Marathi	0	0	0	0	5	0	3	0	0	0	1	0
Commerce	0	0	0	0	4	0	3	0	0	0	10	0
Sociology	0	0	0	0	4	0	2	0	0	0	1	0
Economics	0	0	0	0	4	0	3	0	0	0	1	0
Politics	0	0	0	0	5	0	4	0	0	0	1	0
History	0	0	0	0	4	0	3	0	0	0	1	0
English	0	0	0	0	7	0	5	0	0	0	25	0
YCMOU	0	0	0	0	0	2	1	0	0	0	2	0
Total	2	0	4	6	43	163	96	2	4	3	109	1
Total Watt	44	0	200	72	860	6520	6720	120	2984	2100	16350	200
Total LED Light watt				1376			Regular Light watt					34994

Electrical Audit OFFICE AND OTHERS														
	LED					LED Tubes	Metal Halied	Sodium Vapour lamp	Regular Light	Fan	Exh. Fan	Refreeze	Computer	LED TV
	22 W	15W	50W	1 W	12W	20 W	125W	125 W	40 W	70 W			150w	200w
Principal Cabin	20	13	0	0	2	0	0	0	0	4	0	0	1	1
office	0	0	0	0	24	0	0	0	0	12	0	0	17	0
Guest room	0	10	0	0	2	0	0	0	0	3	0	0	1	0
Staff room	0	0	0	0	5	0	0	0	0	4	0	0	0	0
Vice Principal Cabin	0	0	0	0	2	0	0	0	0	2	0	0	0	0
Ladies Room	0	0	0	0	1	0	0	0	2	1	0	0	0	0
NAAC room	0	0	0	0	4	0	0	0	0	2	0	0	2	0
Ladies Hostel	0	0	0	17	24	0	0	0	33	22	0	0	0	1
Passage and ground	0	0	12	0	0	29	9	1	6	0	0	0	0	0
Toilets	0	0	0	0	0	12	0	0	0	0	0	0	0	0
Total	20	23	12	17	64	41	9	1	41	50	0	0	21	2
Total watt	440	345	600	17	768	820	1125	125	1640	3500	0	0	3150	400
Total LED Watt					2990		Regular Light					9940		

Other Electric Equipment		
	Quantity	Total
Geezer 3000W	5	15000
Printer 500W	14	7000
Printer cum Scanner 890W	9	8010
Xerox 1450W	3	4350
Coffee Machine 250W	2	500
Laptop 125W	1	125
Projector 250W	4	1000
Bell 100W	1	100
Total wattage		36085

Total LED and Regular Light		
	LED Watt	Regular Watt
Classroom	2652	11100
Department	1376	34994
Office and Others	2990	9940
Other Electric equipment		36085
Total Wattage	7018	92119

Solar System for Water heating:

Solar power is pollution free and causes no greenhouse gases to be emitted after installation. Reduced dependence on foreign oil and fossil fuels. Renewable clean power that is available every day of the year, even cloudy days produce some power.

The solar heater is installed on Hostel building with capacity of 4 kl.



Solar Water Heater

E. Solid waste audit:

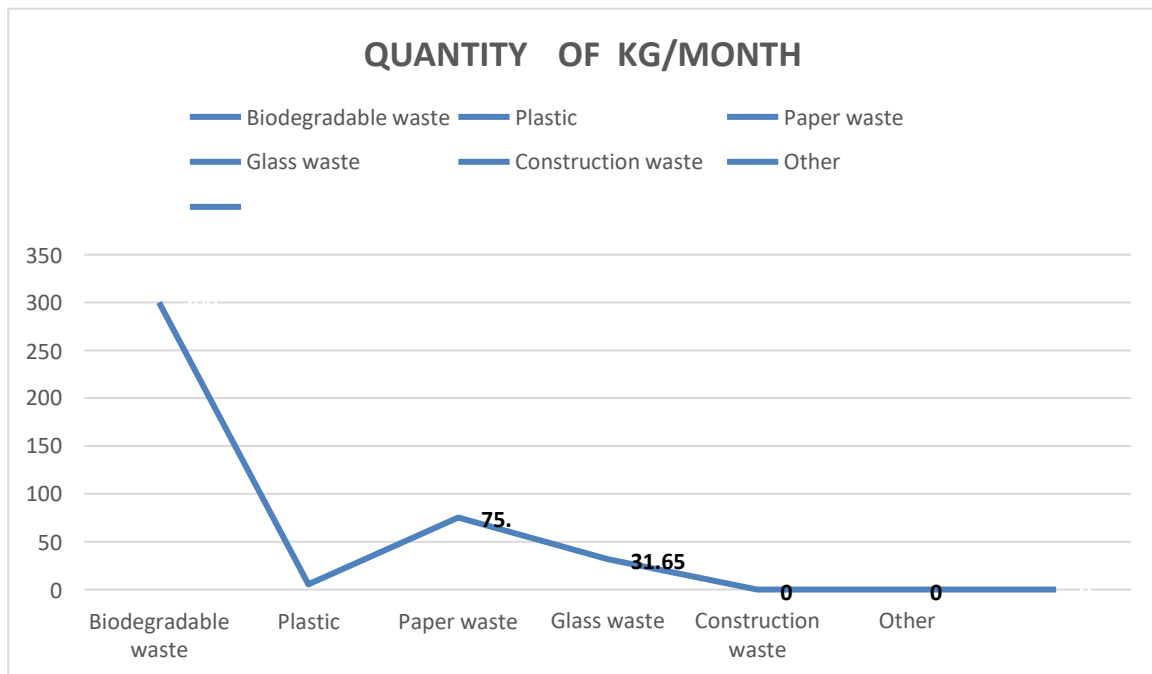
Solid waste management is becoming a major public health and environmental concern world over. Improper solid waste disposal leads to substantial negative environmental impacts e.g., pollution of air, soil, water and generation of greenhouse gases from landfills. Many insect borne diseases are spread through garbage. Therefore, it is necessary to manage the solid waste appropriately to reduce the load on waste management system. The intention of this inventory is to find out the quantity, volume, type and current management practice of solid waste generation in The KBP College, Urun Islampur.

This survey related to solid waste generation would be helpful for making the college more environments friendly.

❖ Generation of solid waste in Karmaveer Bhaurao Patil College Islampur:

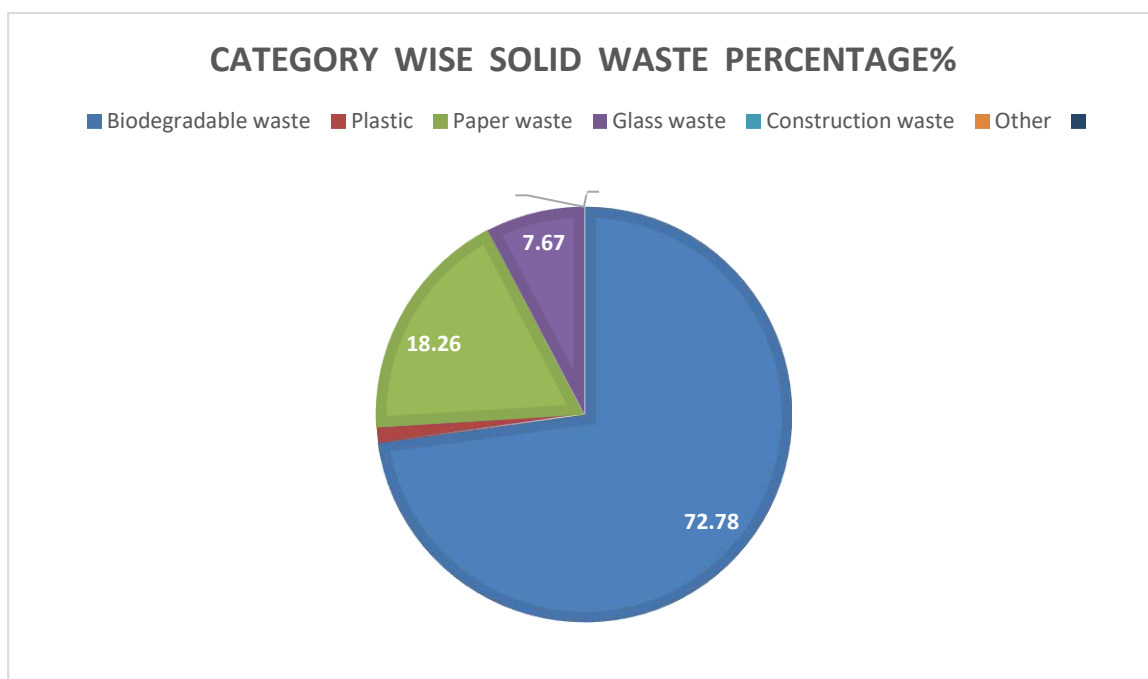
Category wise solid waste generation at Karmaveer Bhaurao Patil College (kg/month)

Category wise solid waste generation at Karmaveer Bhaurao Patil Collge,Islampur (Kg/month)							
Category of Waste	Paper Waste	Glass Waste	Biodegradable Waste	Contraction Waste	Other	Plastic	Total
Quantity Kg/Month	75.3	5.25	300	0	31.65	0	412.2
Percentage	18.267831	1.273654	72.78020378	0	7.678311	0	100



Category wise solid waste generation at Karmaveer Bhaurao Patil College, Islampur.

The average amount of solid waste generated per month in Karmaveer Bhaurao Patil College was 412.2 kg/month. On the basis of observations the highest quantity of solid waste generated is Biodegradable waste which is about 300 kg/month and Paper waste is about 75.3 kg/month respectively. The examination department generated paper waste in large quantity in the college. The plastic waste is produced in minimum quantity i.e. 5.25 kg/month. Besides, the above mentioned wastes, glass waste are generated in the form of broken beakers, pipette, and other Lab glass materials.



Plastic waste generation and its distribution in college campus

Category	Plastic kg/ month				Total
	Hard	Soft	Carry bags	Other	
Quantity	200	50	---	----	250Gm
Percentage	80	20	----	----	100



F.Hazardous waste audit:

Karmaveer Bhaurao Patil College is one of the well-known educational institutes having 3000 student strength. This college caters the facility for Science, Arts and Commerce faculties' students in their campus. Only chemistry department having chemicals hazardous waste but in Future they provide their chemical and water treatment plant at the back side. If there is other waste is produces will hand over to the particular authority.

G.E-waste:

Generation of e-waste is found on every educational institute. It is observed that the E-waste generated at Karmaveer Bhaurao Patil college is of Schedule II category. Computers, Printers, Laptops, Scanners, Internet Routers and Xerox machines are used for administrative work. The wire required for the connectivity also gets included in the e waste. The college has its own computer 149 computers. The library uses some electronic scanners which after its use can become e-waste. Presently, the college is dispatching the e waste to Mahatma Phule Shikashan Sanstha where the waste is collected centrally and it is given to authorized e waste collector.

Key Observations:

- ✓ The average waste generated in the college is. 412.2 Kg/month
- ✓ Highest quantity of solid waste is of Biodegradable waste 300 Kg/month
- ✓ Paper waste is 75.3 Kg/month.
- ✓ Plastic waste is about 1.2 % to the total solid waste on the college campus.
- ✓ Some of the classrooms were found without solid waste baskets.
- ✓ There is need of some improvements into the collection of solid waste.
- ✓ Solid waste is to be segregated at the source.



H.Ambient air quality status:

Ambient air sampling is important part of environmental monitoring. Particulate matter and Trace gases sampling were carried out on the college campus. The sampling was carried out using

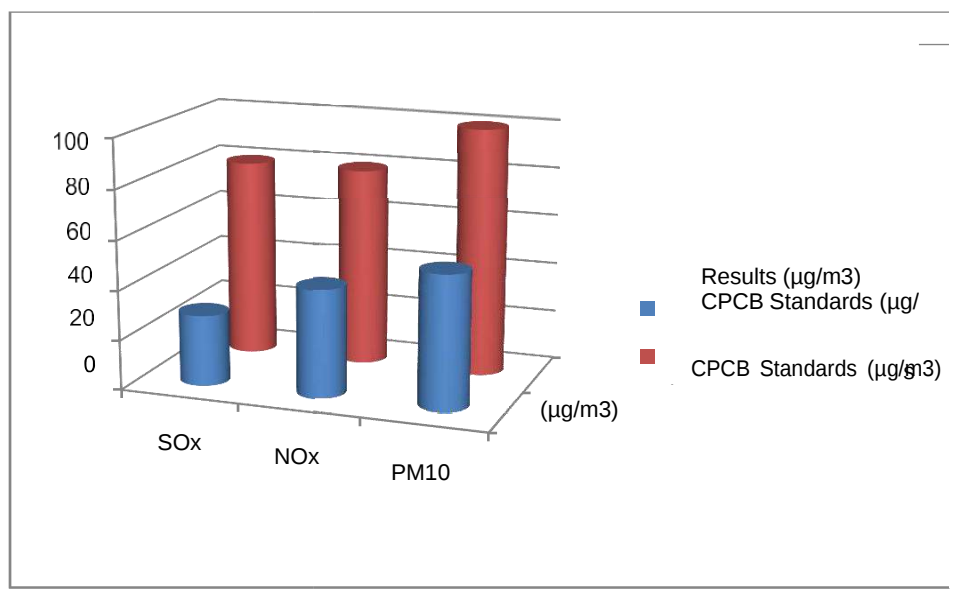
Calibrated Handy Dust Sampler APM 821 with flow rate 1 lit/min equipped with glass fiber filter paper (size 25 mm). The sampling period was 2 hrs.

Sulphur dioxide (SO₂) and Oxides of Nitrogen (NO_x) in the air were estimated with West and Geake method and Jacob and Hochheiser modified method respectively. Particulate matter (PM₁₀) was measured gravimetrically. The samples were collected and analyzed in the approved laboratory. The details of air quality status in the college are given as bellow:

Ambient air quality status of Karmaveer Bhaurao Patil College, Islampur

Sr. No.	Parameters	Results (µg/m ³)	CPCB Standards (µg/m ³)
1	SO _x	45.57	80
2	NO _x	35.33	80
3	PM ₁₀	65.61	100

It was observed that all the air quality parameters analyzed were within the Ambient Air Quality Standards of Central Pollution Control Board, India. The air quality is good in the college campus as well as surrounding.



Ambient air quality status of Karmaveer Bhaurao Patil College Islampur.

I. Ambient noise monitoring status:-

Ambient noise monitoring was carried out in different areas of college campus like at college campus entry, college gate, and corridor, floor and ladies hostel. The sampling was carried out using calibrated Sound Level Meter (AZ 8921) by logarithmic scale in Decibels (dB). The noise readings were collected in the college campus and calculated. The details of noise status in college campus are given as below:

Ambient Noise levels in Karmaveer Bhaurao Patil College Islampur.

Sr. No.	Site Name	Results dB (A) Leq	Standards (Day Time) dB (A) Leq
1	College Campus Entry	65.21	50
2	College Gate	60.04	50
3	Corridor	61.82	50
4	Floor	57.27	50
5	Hostel	50.54	50
6	Canteen	58.39	50
7	Library	31.2	50
8	Academy	36.7	50
9	Office	42.5	50

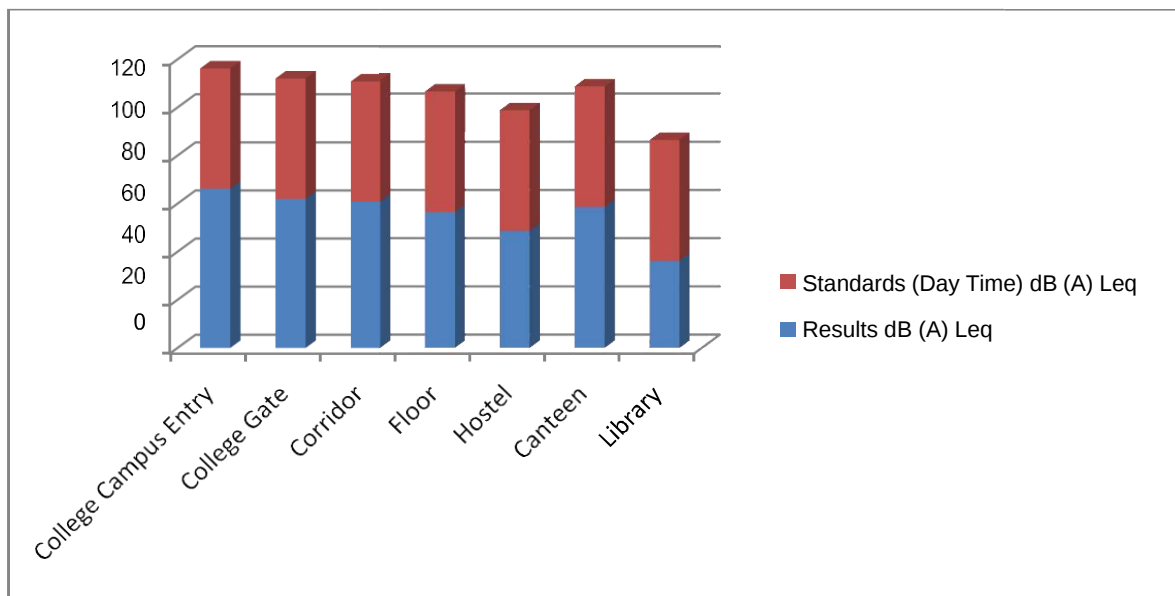
Note: - 1. All parameters expressed in dB (A) Leq.

2. Monitoring is carried during day time.

3. Day time is from 6.00 a.m. to 10.00 p.m.

It is observed from the table that the Ambient Noise levels overall in college is on higher side except ladies hostel as compared to the standards of Central Pollution Control Board for the day time.

Since the college is located adjacent of main roads and therefore, the major source of noise is automobile noise, rolling noise. The human communication and transportation are causing high level sound. It is advisable to increase the green cover in the surrounding to avoid noise.



Ambient Noise levels in Karmaveer Bhaurao Patil College Islampur.

❖ **Parking and traffic management:**

Traffic generated from this project will confluent on 15 m wide road to college.

Parking statement:

Total parking area	2250sq. m2
Area per car	6 m2 for 4 wheeler 2m2 for two wheeler

(Width of all internal roads (m): Width of drive ways is 3 m to 12 m wide)

❖ **Bird's diversity:**

The diversity among birds is striking. Birds live in a variety of different habitats. Birds that live in different habitats will encounter different foods and different predators. Birds can be carnivores (feeding on other animals), herbivores (feeding on plants), or generalists (feeding on a variety of foods).

Sparrow, crow, bulbuls, Pigeon, Cuckoo, Bat, Butterfly, etc these species are seen regularly around the campus.

J.Details of tree census in College campus:

The beginning of the 21st century brought growing concern about global warming, climate change, food security, poverty, and population growth. CO₂ is a principle component causing global warming. Atmospheric carbon dioxide levels have increased to 40% from preindustrial levels to more than 390 parts per million CO₂. On this background it is a need of time to cover the educational campuses with green cover interrelated with climate change.

The current is a present status of tree cover, vegetation and carbon storage assessment of area under Karmaveer Bhaurao Patil College Campus. In an era of global warming and climate change; carbon emission, carbon sequestration, mitigation, adaptation are the keywords in academia. Carbon sequestration is a phenomenon of converting atmospheric carbon i.e. CO₂ in to other pools of carbon such as vegetation, soil, ocean etc. in various forms to mitigate global warming. It is one of the important clauses of Kyoto Protocol. Current tree census methodology has been adopted from the guidelines set by Indian Institute of Remote Sensing, Dheharadoon, Govt. of India.

➤ **Total number of trees enumerated on Karmaveer Bhaurao Patil College campus:**

All the collected data was tabulated and analyzed with the help of MS- Excel spreadsheets and objected findings were extracted by using various factors given by Inter governmental Panel on Climate Change (IPCC).

➤ **Total number of trees enumerated on Karmaveer Bhaurao Patil college campus:** Total 271 numbers of trees with more than 10 cm girth and height more than 4 ft have been enumerated. Girth and height of every tree has been measured.

❖ **Total No. of species identified in Karmaveer Bhaurao Patil College campus.**

Tree species			
Serial No.	Name	Family	Number of individuals
1	Terminalia catappa	Combretaceae	12
2	Delonix regia	Fabaceae	26
3	Ficus glomerata	Moraceae	1
4	Mimusops elengi	sapotaceae	7
5	Mangifera indica	Anacardiaceae	30
6	Polyalthia longifolia	Annonaceae	31
7	Lagerstroemia speciosa	Lythraceae	14
8	Thespesia populnea	Malvaceae	22
9	Tamarindus indica	Fabaceae	6
10	Aegle marmelos	Rutaceae	2
11	Peltophorum pterocarpum	Fabaceae	7
12	Phyllanthus emblica	Euphorbiaceae	1
13	Pongamia pinnata	Fabaceae	1
14	Ficus religiosa	Moraceae	4
15	Eugenia jambolana	myrtaceae	8
16	Terminalia bellirica	Combretaceae	3
17	Bauhinia racemosa	Fabaceae	7
18	Butea monosperma	Fabaceae	3
19	Azadirachta indica	Meliaceae	4
20	Leucaena leucocephala	Fabaceae	11
21	Melia azadirachta	Meliaceae	15
22	Grevillea robusta	Proteaceae	7
23	Samanea saman	Fabaceae	14
24	Ficus benghalensis	Moraceae	8
25	Artocarpus heterophyllus	Moraceae	2
26	Terminalia chebula	Combretaceae	1
27	Ficus carica	Moraceae	1
28	Cassia fistula	Fabaceae	1
29	Magnolia champaka	Magnoliaceae	6
30	Psidium guajava	myrtaceae	2
31	Moringa oleifera	Moringaceae	1
32	Santalum album	Santalaceae	1
33	Cocos nucifera	Arecaceae	2
34	Tectona grandis	Verbenaceae	6

35	Citrus medica	Rutaceae	1
36	Acacia auriculiformis	Fabaceae	2
37	Neolamarckia cadamba	Rubiaceae	1
Total			271

Garden plants			
Serial No.	Name	Family	Number of individuals
1	Araucaria	Araucariaceae	1
2	Thuja	Cupressaceae	12
3	Livistona chinensis	Arecaceae	3
4	Tabernaemontana divaricata	Apocynaceae	5
5	Punica granatum	Lythraceae	1
6	Hibiscus rosa-sinensis	Malvaceae	13
7	Jasminum sambac	Oleaceae	1
8	Duranta erecta	Verbenaceae	40
9	Phyllostachys aurea	Poaceae	15
10	Ficus species	Moraceae	14
11	Garden Palm	Arecaceae	90
12	Ixora species	Rubiaceae	2
13	Phoenix sylvestris	Arecaceae	3
14	Rosa indica	Rosaceae	25
15	Nyctanthes arbor-tristis	Oleaceae	3
Total			233

Medicinal plants		
Serial No.	Name	Number
1	Phyllanthus emblica	1
2	Adhatoda vasica	1
3	Aloe vera	1
4	Oscimum spp	1
5	Santalum album	1
6	Garcinia spp	1
7	Achyranthes aspera	1
8	Achorus calamus	1
9	Butea monosperma	1
10	Asparagus racemosus	1
11	Cassia fistula	1
12	Curcuma longa	1
13	Zingiber officinarum	1
14	Gloriosa superba	1
15	Lawsonia inermis	1
16	Tinospora cordifolia	1
17	Withania somnifera	1
18	Tridax procumbans	1
19	Eugenia jambolana	2
20	Eclipta alba	1
	Total	21

Total Green cover area	
Total Area	15043
Total Green cover area	4500
% Area Covered	29.91424583

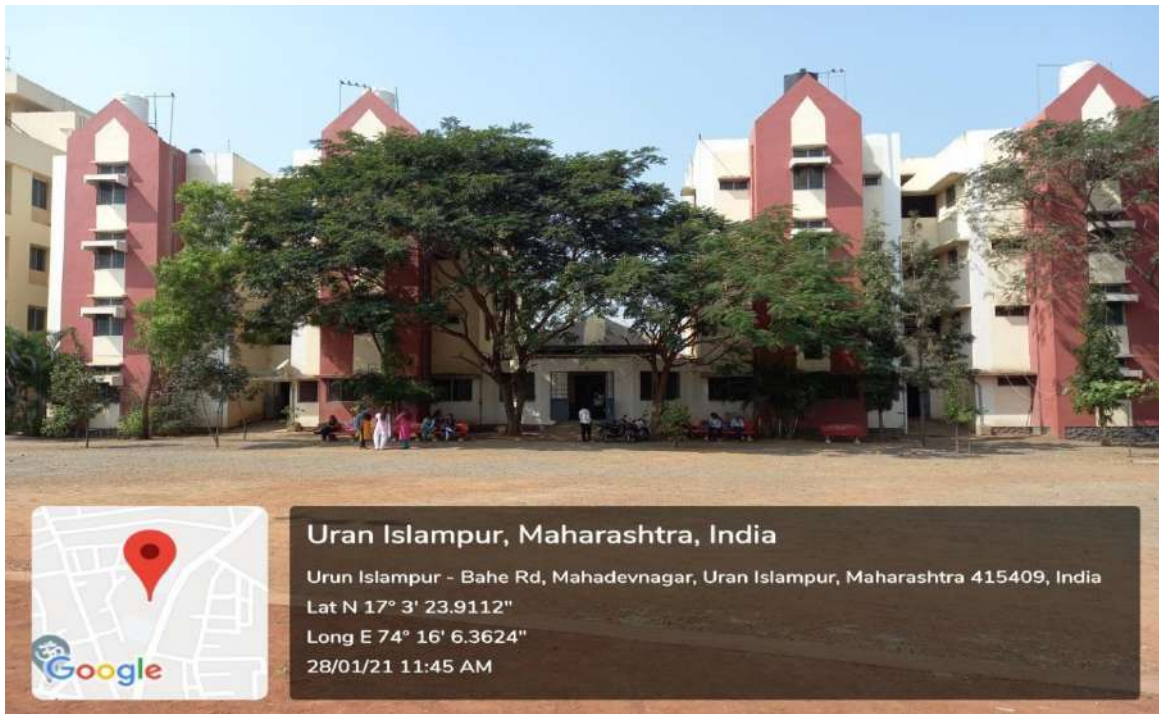
Total CO2 Consumed annually 6.54 Ton

Environmental protection through activities conducted



Front view of the College

Women's hostel building



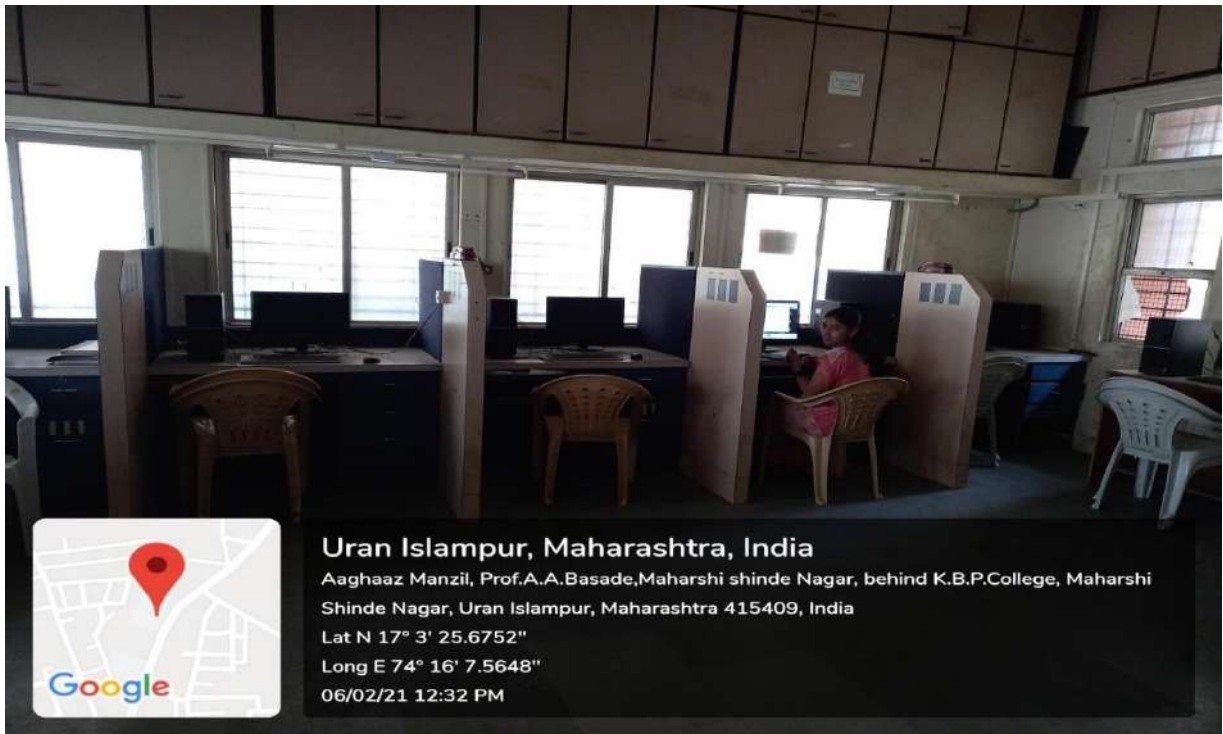
Parking



College office



Chemistry laboratory



Computer laboratory



Drinking water facility (RO)



Composting peat



Rain water Harwasting

CONCLUSION AND MANAGEMENT PLAN

The Natural Solution Environment consultant, Islampur has conducted a Green Audit of Karmaveer Bhaurao Patil College Islampur in the academic year 2021-22. Green auditing is the process of identifying and determining whether institution practices are eco-friendly and sustainable. The main objective of college to carry out green audit is to check green practices followed by college and to conduct a well formulated audit to understand where we stand on a scale of environmental soundness.

Conclusions:

From the green audit conducted by college following are some of the conclusions which can be taken for improvement of the college campus to become environment friendly college campus.

1. College takes efforts to dispose majority waste by using proper methods.
2. Confidential paper waste is disposed properly.
3. Glass waste is to be disposed properly.
4. Electricity consumption is more at some departments.
5. Use of CFL lamps in the college is minimum. Its use should be encouraged and now converted to LED lights.
6. Toilets and bathrooms are consuming more water.
7. Roof top rain water harvesting should be planned which is useful for filling up of tanks on campus.
8. E-waste segregation, handling and disposal are properly done.
9. Practice of waste segregation to be initiated.
10. Air quality on the campus is good.
11. Conduct more seminars, Camps and group discussions on environmental education and awareness.

Recommendations:

Following are some of the key recommendation for improving campus environment.

1. College should develop its own Environmental Policy by using guidelines given in Green Audit document.
2. The data related to all measured environmental parameters should be monitored and recorded regularly and information be made available to administration.
3. The college should develop internal procedures to ensure its compliances with environmental legislation and responsibility be fixed to carry out it in practice.
4. Wherever possible the waste should be reused or recycled.
5. All street lighting should be changed to LED lights to save electricity.
6. Rain water harvesting must be installed.
7. Drip irrigation for gardens and vegetable cultivation can be initiated.
8. Practice of waste segregation to be initiated.
9. Sewage Treatment Plant must be Install.
10. Chemical Water treatment Plant (ETP) Plant must be install.

ENVIRONMENT MANAGEMENT PLAN:

By understanding the dynamics of present situation of resource utilization and current practices of waste disposal we have prepared an Environment Management Plan (EMP) for the The KBP College Islampur Dist. Sangli. This plan not only will provide the strengths, weaknesses and remedies for the green and clean campus but also give priority of the sector where the college has to give more efforts to improve its environment.

Sector	Strengths	Suggestions
Solid Waste		
Paper	1. Pulping of major portion of papers i.e. answer sheets, bills and other administrative papers. 2. Use of one sided papers in many departments and main building	• Towards paperless office: More use of e-mails, e-money transfer and advance IT technology for communication
Plastic	Reuse of plastic at some departments	• Segregation of waste at the source and sending plastic waste for recycling • Ban on Plastic carry bags in College premises
Biodegradable waste	Solid waste generated	• Segregation of solid waste help in composting process
Biodegradable Waste	Liquid waste	• Install sewage treatment plant.(STP) • Instead of fresh water for garden, use treated STP plant water so reduce the load of fresh water.
Septic Tank	Organic waste.	• Use Bacteria for fast degradation of organic waste.
Energy		
Electricity	Use untraditional source of energy	• Employment of more solar panels and other renewable energy sources. • Electrification of street lights by solar power. • Use of solar pumps for water tanks. • General awareness about Electricity saving.

Fuel	Use of public Transport system is comparatively more by staff and students.	• 'Cycle on rent' service for student • General awareness about Efficient use of fuel.
Water		
Water utilization	College has potential of Rain water harvesting. High liquid waste Generation.	• Installation of automatic water pumps to avoid overflowing losses • Proper and timely maintenance of plumbing at all departments • Installation of rain water Harvesting assembly. • Install sewage treatment plant.(STP)

Hazardous Waste		
E-waste	• E waste is sent to E waste collection center	• There must be segregation of e- waste from regular waste and also among the e-waste. • E-waste in all forms not only computers, should be collected properly
Air and Noise		
Air and Noise	Air quality is still in good condition	The plantation can be increased by Vertical gardening.
Tree Census		
Tree Vegetation	There is requirement of Tree Plantation	Avoid monoculture, variety of species should be planted in campus area

About WTES –

Consulting enviro engineers & designers.
Turnkey project for ETP/STP
Up gradation modification of ETP/STP
Water & Waste Water treatment chemicals.
Water & Waste Water treatment chemicals.



GSTIN:-27ABYPI4809G1Z8

UAM No.MH29D0037743

CERTIFICATE

This is to certify that Karmaveer Bhaurao Patil College, UranIslampur has undergone detailed Environmental Audit, Green Audit, Energy Audit of their campus and submitted necessary data and credentials for scrutiny. The activities and measures carried out by the college have been verified based on the report submitted and was found to be satisfactory. This green audit is also aimed to assess impact of green initiatives for Maintenance of the campus eco- friendly.

Place :- Uran Islampur

Date :- 05/03/2022

For, Natural Solution



Ingale
Prashant Ingale.

Environmental Engineer

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