

GREEN AUDIT REPORT

2023-2024

ADITYA PHARMACY COLLEGE (APC)



ADITYA

PHARMACY COLLEGE



Prepared BY



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Greening the globe.

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Acknowledgement

Global Green Solutionz (GGS) is thankful to the management and staff of Aditya Pharmacy College (APC) for awarding Green Audit for their college at Surampalem, East Godavari, Andhra Pradesh.

The Study team members of Global Green Solutionz would sincerely like to thank all the Department Heads and support staff members of Aditya Pharmacy College (APC) for providing the necessary support in order complete the green audit.

For Global Green Solutionz




Principal
Aditya Pharmacy College
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INTRODUCTION

The term "Green" means eco-friendly or not damaging the environment. This can acronymically called as "Global Readiness in Ensuring Ecological Neutrality" (GREEN). Green audit was initiated in the beginning of 1970s with the motive of inspecting the work conducted with in the organizations whose exercises can cause risks to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multi-national companies, armies and national governments with the concern of health issues as the consequence of environmental pollution. Green Audit is one of the systematic audits to assess the impact of the institutions on the environment with respect to land, air, water, solid waste, noise etc. In order to conduct the green audit a systematic identification, recording, reporting and analysis is essential. The objective is to analyze environmental practices within and outside of the concerned facilities, which will have an impact on the eco-friendly ambience. Green audit is one of the useful tools for a college to determine how and where they are using the vital resources such as energy, water etc. Thus, it provides the opportunity to identify the potential options to conserve these precious natural resources. The college can then consider how to implement changes and make savings. It also includes the determination of various types of wastes and how to manage them effectively without polluting the environment. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding and encourages them to cultivate the green practices in the campus. It is the need of the hour for the colleges to evaluate its own contributions toward a sustainable future. Environmental sustainability has become one of the pressing issues for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological impacts. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric carbon-di-oxide from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report.

OBJECTIVES:

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. In recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since its inception. But the auditing of this non-scholastic effort of the college has not been documented.

Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use of the campus
- To map the Geographical Location of the college
- To record the meteorological parameter of Surampalem where college is situated.
- To estimate the Energy and water requirements of the college



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- To document the Waste disposal system
- To document the ambient environmental condition of air, water and noise of the college
- To introduce and aware students to real concerns of environment and its Sustainability.

METHODOLOGY:

It is the duty of the organizations to carry out the green audits of their on-going process for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedure and ability of materials, to analyze the potential duties and to determine a way in which can lower the costs and add to the revenue. Through, green audit, one gets a direction as to how to improve the condition of the environment and there are various factors that have determined the growth of carrying the green audit. Green audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation council which is a self-governing organization of India that declares institutions as Grade A, Grade B and Grade C, according to the scores assigned at the time of accreditation. The Intention of Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn it into better environmentally friendly institute.

Step under Green Audit:

- **Plan the audit:** Green auditing related data was collected during March and April 2023
- **Select the audit team:** APC has hired Global Green Solutionz (GGS) to conduct the green audit. GGS has appointed a well-qualified team that has good knowledge in the field of environment.
- **Schedule the audit facility:** The audit facility is the APC campus.
- **Acquire the background information:** GGS team has interviewed the appointed green audit coordinators from APC College. They have submitted the relevant data related to landscaping, built up area, energy and water related data which are part of the report.

Benefits of Green Audit:

- To Shield the environment
- To recognize the cost saving methods through waste minimizing and managing
- To point out the prevailing and forthcoming complications
- Authenticate conformity with implemented laws
- Empower the organizations to frame the better environmental performance
- It portrays the good image of the institution which helps building better relationships with group of stakeholder.



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ABOUT THE COLLEGE

The Aditya Pharmacy College (APC) has commenced working from the academic year 2004-05. The first batch of students has passed out in the year 2008. The students are given coaching in the III and IV year for the GPAT examination as a result the number of students who are qualified in the GPAT examination is quite high. The students participate in various scientific poster presentations and seminars that are organized in different colleges and present seminars and poster presentations and secure prizes for their participation.

The College has over the years acquired advanced equipment and installed in various laboratories. Realizing the importance of web-based learning the management has provided a high speed internet laboratory for the students. There is huge collection of books and journals which are subscribed regularly. The college has started the post graduate courses like Pharmaceutics and Pharmaceutical analysis & quality assurance in pharmacy (M. Pharmacy) in the year of 2008 and 2009. The college has started the Pharm. D Course from the year 2010 –11. The college name has been changed to Aditya Pharmacy College in the year of 2015.

The College is located in an eco-friendly area of 180 acres with thick greenery at Surampalem, Gandepalli Mandal, East Godavari District, and Andhra Pradesh. The College is 15 KM away from Samalkot Railway Station on Howrah-Chennai Railway line in South Central Railway. The College is 35 Km away from Kakinada and Rajahmundry on ADB Road.

The college offers below stated three courses:

Under Graduate Courses : B. Pharmacy
 Post Graduate Courses : Pharm. D, and M. Pharmacy

No. of students – studying all branches and classes during 2023-2024

S. No	Course	No. of Students
1	B. Pharmacy	411
2	Pharm. D	156
3	M. Pharmacy-Pharmaceutics	1
4	M. Pharmacy-Pharmaceutical Analysis	4
Total		572

It is approved by AICTE, recognized by Govt. of Andhra Pradesh, permanently affiliated to Jawaharlal Nehru Technological University Kakinada (JNTUK), and is accredited by National Assessment and Accreditation Council (NAAC) with 'A' Grade. The college also received UGC recognition under Sections 2(f) and 12 (B) of the UGC Act.



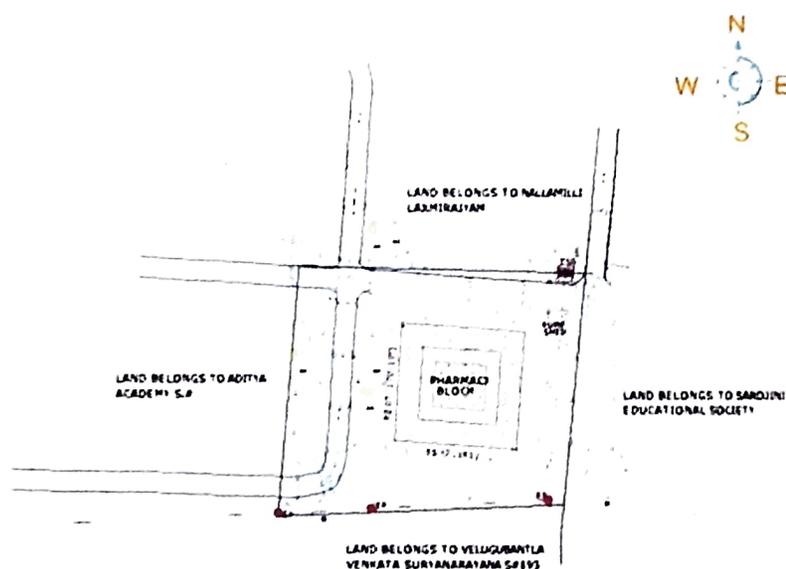
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LAND USE ANALYSIS, ADITYA PHARMACY COLLEGE, SURAMPALEM, ANDHRA PRADESH (2023)

GENERAL OVERVIEW OF THE CONCEPT OF LANDUSE

Land use involves the management and modification of natural environment or wilderness into built environment such as settlements and semi-natural habitats such as arable fields, pastures, and managed woods. It refers the activities and the various uses which are carried on and derived from land. Viewing the earth from space, it is now very crucial in man's activities on natural resource. In situations of rapid changes in land use, observations of the Earth from space give the information of human activities and utilization of the landscape (Howarth 1981).

The collection of remotely sensed data facilitates the synoptic analyses of earthsystem, functions, patterning, and change in the local, regional as well as at global scales over time. Satellite imagery particularly is a valuable tool for generating land use map using Google maps.



Site Layout Map of Aditya Pharmacy College (APC)

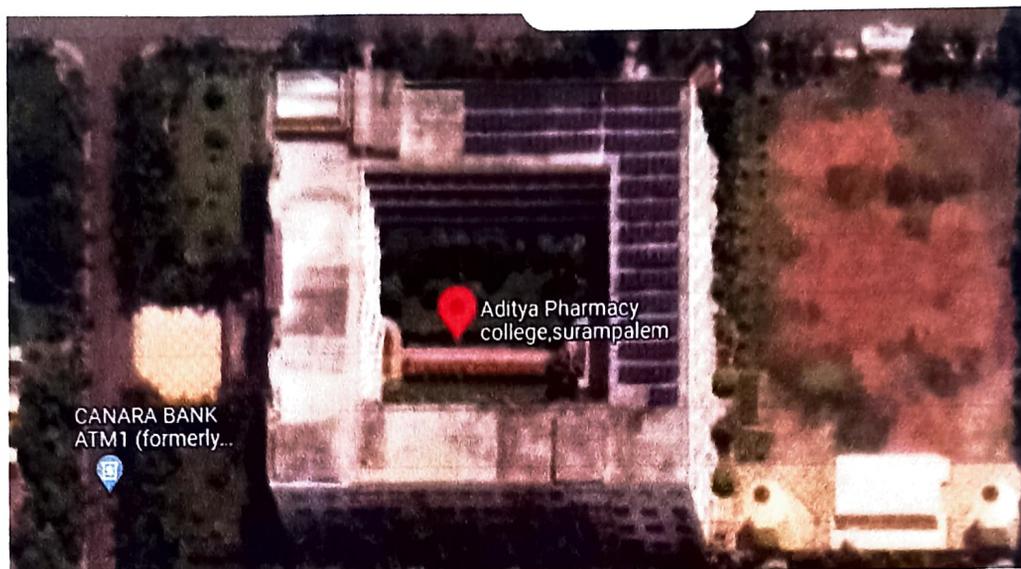
METHODOLOGY ADOPTED FOR LAND USE MAPPING

Three types of data that are GPS points, field survey data and Google earth data for Geo-referencing have been used in this study. Land use map of the study area have been prepared using the above three types of data with the help of Google maps.

LAND USE DATA OF ADITYA PHARMACY COLLEGE, SURAMPALEM

CATEGORIES OF LAND USE	AREA IN SQ METRES
BUILT UP AREA	7440

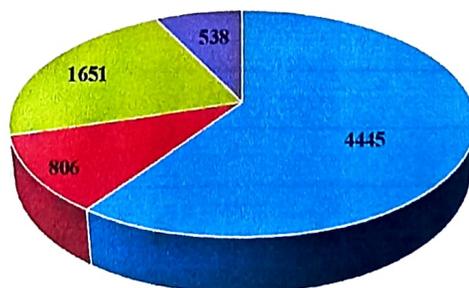




LAND USE (BUILT-UP AREA) ANALYSIS:

CATEGORIES OF LAND USE (BUILT-UP AREA)	AREA IN SQ METRES (SQM)
Institutional Area	4445
Administrative Area	806
Amenities Area	1651
Circulation Area	538
TOTAL AREA	7440

Built-up Area (SQM)



■ Institutional Area ■ Administrative Area ■ Amenities Area ■ Circulation Area



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The institutional area sums up to 4445 sq. meters, followed by circulation area 538 Sq. meters. Administrative Area is 806 sq. meters. The amenities occupy 165 sq. meters. Aditya Pharmacy College, which was established in the year 2004, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Total area is occupied by open land and plantation that generates a better and sustainable campus environment.

Tree Diversity at Aditya Pharmacy College, Surampalem

APC is within the geo position between latitude 17.0891248 N, and longitude 82.07033429 East Surampalem, 30 Km from Kakimada city India. It encompasses an area of about 12 acres of greenery in Surampalem. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programmes organized by the college management and have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. We often make an emotional connection with these trees and sometime become personally attached to the ones that we see every day. Thus, the college has been playing a significant role in maintaining the environment and its surrounding areas.



Aditya Pharmacy College's Campus is having total green area of 2.5 acres



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Below stated information is provided by the college management team:

- APC campus has a beautiful garden area. The garden has different sections in which specific types of plants are planted with respect to their medicinal importance and Vedic reference. Boards are displayed for each section and plants names. Sprinkler system is provided in herbal garden.
- Large trees and potted plants were seen in the campus. Plantation improves aesthetics and helps as buffer in reducing noise level, maintaining temperatures of the area.
- Garden is managed by the gardener. Organic fertilizers and pesticides are used for plants if necessary.


ELECTRICAL POWER CONSUMPTION AT ADITYA PHARMACY COLLEGE

Transformer capacity : 500KVA
 Diesel generator, if any and capacity : 400KVA

No. of pumps:

Borewell and Sump Pumps

BOREWELL	4X5 HP=20 HP
Sump	4X5 HP=20 HP

S. No.	Name of the Building	No. of Rooms
1	ADITYA PHARMACY COLLEGE	46

Building-wise inventory details: Type of tube lights, wattage, no. of fans, no. of ACs,

S. No.	Name of the Building	Fans each 50 Watt	C.F.L 10 Watt	Tube Lights 20 Watt	A. C 1.5 Ton
1	ADITYA PHARMACY COLLEGE	280	53	223	05



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Roof top solar power plant, if any – capacity, no. of units generated, consumption and export for last 12 months

Capacity:	500 KVA
No. of units generated:	6, 19,792 (From 01/01/2023 - 31/12/2023)
Consumption:	2, 79, 258
Export:	3, 40,534

Renewable Energy: A rooftop solar PV System of 500 KW capacity has been installed to cater to the college's energy needs.



The college has also started using clean energy since 2018 from the 500 KW Solar powerplant installed near the college. It has produced 696375 kWh of clean energy during 2023.

Weather Data of Kakinada

Month-wise weather data of Kakinada City (30 Km from Surampalem, for the year 2023)

Month	Max Temp (C°)	Min Temp (C°)	Precipitation (mm)
January	29.5	17.1	5
February	31.2	19.3	10
March	33.5	22.5	15
April	35.8	25.1	20
May	37.2	27.3	25
June	36.5	26.8	150
July	34.0	25.0	200
August	33.5	24.8	180
September	33.0	24.5	170
October	32.0	23.5	220
November	30.0	21.5	100
December	28.5	19	50

The above table shows that the temperature is high in May and low in January, and the rainfall is high in October and low in January.



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Air Quality Determination

Satisfactory: Air Quality Index in Rajamahendravaram Weather Station (34 km from Surampalem) on the 12th of December, 2023

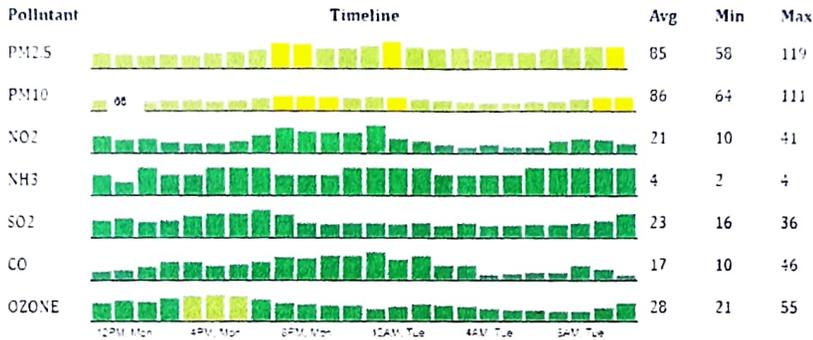
Satisfactory

Anand Kala Kshetram, Rajamahendravaram - APPCB

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Prominent Pollutant is **PM10**

On **Tuesday, 12 Dec 2023 10:00 AM**



The Overall Air Quality Index is found 120 as per the publicly available data for the month of December 2023. This indicates Moderate Air Quality. However, as the APC campus is surrounded by greenery and plantation, the air quality is of much better quality.



Indoor Air Quality:

The interviews with the college staff have revealed the below:

- During day- time, Air Quality Index (AQI) might be at the range of 45-60 because of campus greenery
- In kitchens present in Cafeteria, LPG is used for cooking which is a clean fuel.
- In classrooms the mode of ventilation is natural draft (through windows) and is enhanced by fans. Large windows and cross-ventilation are observed in corridors. Air conditioners are used in some offices, computer laboratories and computer server room.
- Exhaust fans are provided in chemistry laboratory and all kitchens.



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WATER ANALYSIS REPORT OF ADITYA PHARMACY COLLEGE

APC consumes the ground water stored in the overhead tanks. The campus blocks have their respective overhead tanks to meet the water needs of the institute. Total water consumption of the institution is estimated to be at 50,000 liters per day approximately.

RO PLANT

Reverse osmosis water is available for drinking on the campus. There are 3 units of R.O. plant, each with a treatment capacity of 2000 liters per hour. Sump storage capacity of the plant is 50,000 liters.

USAGE OF R.O. EJECT

R.O. Plant Water Eject is used for watering plants in the institution. Green audit team noticed that the drinking water quality was found good and potable. Green audit team has noticed that there is a water harvesting pit where the RO reject is used to recharge the ground water. Approximately 40% of the water entering the RO water gets rejected which is used to recharge the ground water.

Waste Water: Waste water is mainly generated from toilet flushing and kitchens. Waste water generated from academic blocks is collected in septic tanks and passed to surrounding trees and plants through canals.

Rain Water Harvesting

Rainwater collected from all buildings is gathered in the building blocks interior gardens. Some rainwater is directly absorbed into the ground, while some is used for vegetation development. The majority of the precipitated water was channeled to the inner garden area's outlet, where it entered the combined drainage system. The drained water was sent to the campus's open ponds, while precipitation that fell near the ponds was also transported through drains and gathered in the ponds.

NOISE LEVEL IN THE SURROUNDING OF APC.

Institute site visit observations revealed that the noise levels were found little above the permissible limits.



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WASTE MANAGEMENT AT ADITYA PHARMACY COLLEGE

Management of solid waste is an important driver in Green Audit. Solid waste not properly managed leads to the degradation of the environment which, in turn, affects the flora and fauna. Keeping this in mind, the College has been strictly implementing scientific solid waste management to maintain the green status of the campus.

The present Prime Minister of India Sri Narendra Modi launched 'Swachh Bharat Abhiyan' (Clean India Mission) on 2nd October, 2014. In this mission, the proper use of dust/waste bins is one of the major priorities. For the implementation of this mission, collective mass effort is necessary. For proper segregation and management. Proper use of waste bins is the only solution for waste management purpose in the college campuses.

Waste Management includes the management and handling of all types of wastes. This waste types include the following:

Wet Waste: Wet waste includes the organic waste such a food waste, kitchen waste after peeling the vegetables and garden waste etc.

Dry Waste: Dry waste can be categorized into different wastes such as plasticwaste, E- Waste, bio-medical waste, Construction & demolition waste and hazardous waste.

Paper Waste:

In order to reduce the paper waste, the management started digitization. It has implemented good practices such as prints and photocopies are taken on both sides of the pages. Further, the campus has E-book facility since 2019 all the book are available on the college website for the students at any time. Further, records of books and e-books are well kept and were available for review.

Internal notices and communications are through E-mail/SMS. APC has Learning Management System (LMS) where notices are sent, exam results are displayed and attendance is recorded digitally.

Other good practices followed by APC are provided below:

- Biometric attendance is provided for APC staff.
- Paper notices are displayed on the notice boards. The dissertation reports, journals, and answer papers are stored as per the University rules.
- Approximately 5 kg paper waste is expected to be generated by APC each year. Old papers and books are given to the recyclers.
- APC encourage students to use eco-friendly material and recycle old papers/ scrap for decoration purpose during college festivals.

Solid Waste: Being an institute with residential facility, considerable quantity of wet (food/organic) waste is generated in the premises. Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. It is a great concern relating to environment and society Aditya Pharmacy College took major steps to manage the waste to protect and create a clean and pleasant environment. The departments as well as administrative offices generates some waste and put in two bins for wet waste and dry waste kept in departments and corridors. Each building has several dust bins from where the housekeeping staff collects the trash. In the same manner waste from canteens, residential quarters and guest houses is collected. The collected waste is dumped in big containers (wet and dry) by the housekeeping staffs regularly. The whole waste is then segregated and then the waste that can be used for composting is dumped for vermicomposting. Vermicomposting unit converts the biodegradable waste to fertilizer. This fertilizer is used to promote the lemon orchard located in the APC campus. APC discourages use of plastic; particularly single use plastics in campus. Paper wastes from departments, Library, Administrative offices are disposed through vendors. The wastes are properly stacked in designated place and later disposed through vendors for proper waste management.



E-Waste:

Being one of the progressive colleges in India, APC has also moved to on-line learning system through its e-courses. This includes classrooms, library, internal mails etc. All the classrooms are digitized. It also has an E-library, student & staffportal for academic work, biometric attendance system for staff, etc. Electronic goods are put to optimum use; the minor repairs are set right by the Laboratory assistants and teaching staff; and the major repairs are handled by the Technical Assistant and are reused. APC has informed that they have entered MoU with ELECTROPRO SYSTEMS which buys our damaged computers and other non-reparable e-waste and issues a recycling certificate. ELECTROPRO procures the equipment which cannot be refurbished for re-use is dismantled and remanufactured into raw materials (i.e. metals, plastics, glass) to be marketed as recyclable. The waste compact discs and other disposable non-hazardous items are used by students for decoration during college fests as a creative means of showcasing the waste management practice that has been induced in the minds of the students.

Transportation

The College is 15 KM away from Samalkot Railway Station on Howrah-Chennai Railway line in South Central Railway. The College is 35 Km away from Kakinada and Rajahmundry on ADB Road. APC provides buses and cars for transportation. For students/ staff. Most of the staff pool buses and cars and a few staff members travel by private vehicles. APC management encourage students and staff to use the college buses or public transport system to reduce carbon emissions. Campus uses three 72V 5 KW electrical vehicles with 12 seating capacity.

Green Initiatives

Due to minimum consideration for environment & sustainability, the world is facing problems of ozone depletion, climate change, water scarcity and sustainable resource management. APC organizes guest lectures on Environmental conservation, biodiversity, etc. every year.

APC has a demonstrated consistent commitment towards nature and environment. APC started Haritha eco green club, which offers wide spectrum of environmental and nature activities and platforms to enhance awareness and exhibit the relationship with nature. Various activities organized by 'Haritha' involved guest lectures, nature visits, workshops and competitions. NSS groups of APC organized the green activities and awareness campaigns such as plantation camps in college, rally in nearby villages.



Recommendations/ Suggestions

For Indoor Air Quality

- Indoor plants can be chosen in such a way that they give aesthetic appearance as well as health benefits.
- Information on sources, impacts and mitigation of indoor air pollution to be displayed within APC for increasing awareness about indoor air pollution.
- E.g. Signage can be placed in chemistry laboratory for handling fuming chemicals.

Water Conservation

- Provide information on water usage and savings to students/ staff through notices, screen savers in computer laboratories, and encourage reduction/ wastage of water.
- Replace all old water faucets with water saving faucets, aerator taps, jet sprays etc. Installation of such faucets can save water and help in minimizing the water footprint.



- Dual flushing system can be installed for toilet flushing, with appropriate instructions, which will save considerable amount of water.
- Grey water/ sewage recycling system can be installed for flushing toilets. This will reduce the fresh water footprint.

Signage/ posters should be posted in high water consumption areas in Academic Blocks to increase awareness regarding water conservation.

- As the source of water is borewell, APC can install water meter on borewell to monitor daily borewell withdrawal.
- Implementation of the STP could reduce the dependency on the ground water.



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