

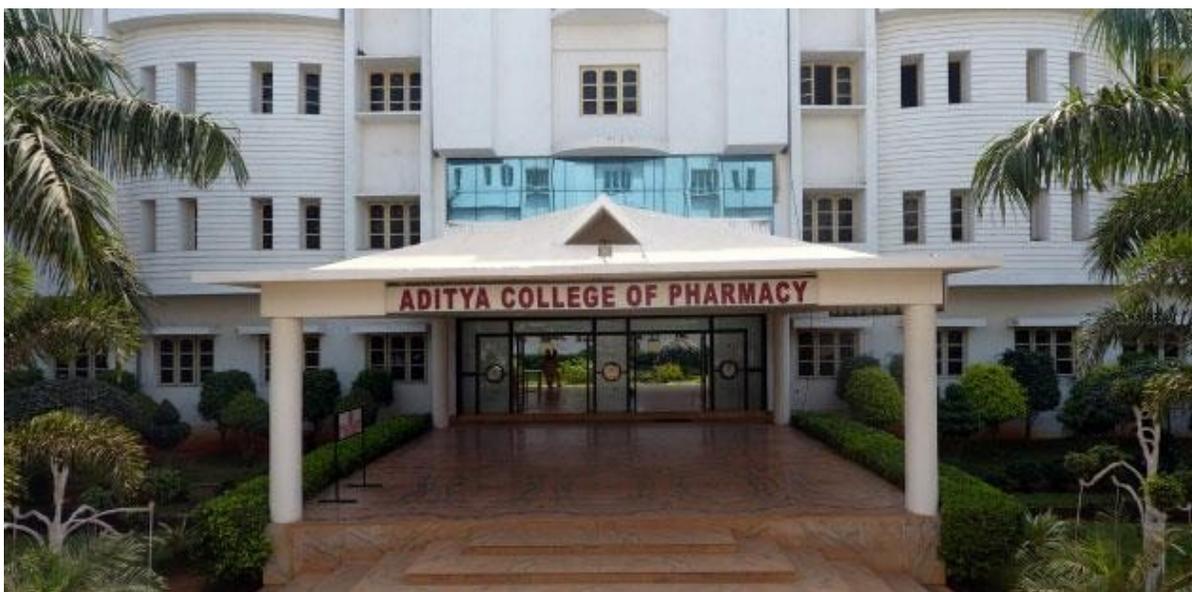
# GREEN AUDIT REPORT

## 2022-2023

### ADITYA COLLEGE OF PHARMACY



**ADITYA**  
COLLEGE OF PHARMACY



**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 College of Pharmacy (ACoP) 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 College of Pharmacy for providing the necessary support in order complete the green audit.

For Global Green Solutionz

## **INTRODUCTION**

The term “Green” means eco-friendly or not damaging the environment. This can acronymic ally is 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
- 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 originations 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 2022
- **Select the audit team:** ACoP has hired Global Green Solutionz (GGS) to conduct the green audit. GGS has appointed a is well qualified team that has good knowledge in the field of environment.
- **Schedule the audit facility:** The audit facility is the ACoP campus including the connected hostels.
- **Acquire the background information:** GGS team has interviewed the appointed green audit coordinators from ACoP. 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 stakeholders

## ABOUT THE COLLEGE

Aditya College of Pharmacy was established in 2006 by Founder and Chairman, N. Sesa Reddy under Sarojini Educational Society who is the pioneer in educational institutions of Andhra Pradesh. The institute is affiliated to JNTUK, approved by AICTE and recognized by PCI, New Delhi. Aditya College of Pharmacy has a team of well experienced and most knowledgeable faculty members, and it facilitate the students to access well equipped laboratories and technologies available in the institute.

Aditya College of Pharmacy creates an environment that opens up new worlds of opportunity. From the day of its inception, the college is producing highly qualified human resources who are academically superior and ethically strong. The campus is located at Surampalem, East Godavari District of Andhra Pradesh equidistant from Rajahmundry and Kakinada, the two major cities of the District. It offers Pharmacy, Pharm D & M. Pharmacy courses in pharmaceutical technology & Pharmacology.

The College is located in an eco-friendly area of 180 acres with thick greenery at Surampalem, Gandepalli Mandal, East Godavari District, 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, M. PHARMACY

No. of students – studying all branches and classes:

S. No	Course	No. of Students
1	B. PHARMACY	429
2	PHARM.D	156
3	M.PHARMACY	23
<b>Total</b>		<b>608</b>

It is approved by AICTE, recognized by Govt. of Andhra Pradesh, affiliated to Jawaharlal Nehru Technological University Kakinada (JNTUK). The college also received UGC recognition under Sections 2(f) of the UGC Act.

## LAND USE ANALYSIS, ADITYA COLLEGE OF PHARMACY, SURAMPALAM, ANDHRA PRADESH (2022)

### 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 College of Pharmacy**

### **METHODOLOGY ADOPTED FOR LAND USE MAPPING**

Three types of data that are GPS points, field survey data and Google earth data for Georeferencing 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.



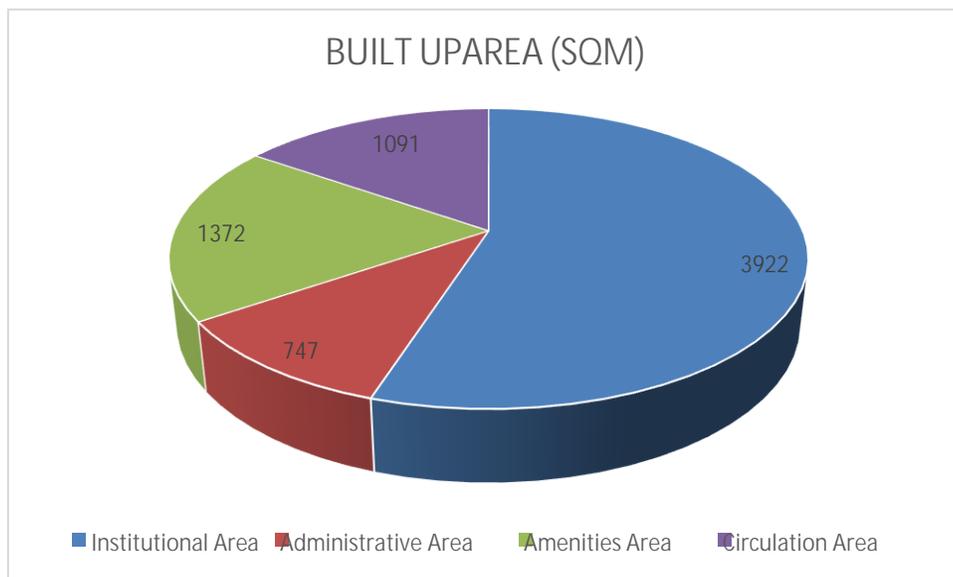
**LAND USE DATA OF ACoP, Surampalem**

<b>CATEGORIES OF LAND USE</b>	<b>AREA IN SQ METRES</b>
OPEN SPACE AND PLANTATION	1507.4
BUILT UP AREA	7132.54
TOTAL AREA	<b>8639.94</b>

The total area of ACoP is sq. meters out of which the built-up area is 82.5% (i.e., 7132.54 sq. meters) and open space area is 17.5% (i.e., 1507.4 sq. meters).

**LAND USE (BUILT UP AREA) ANALYSIS:**

CATEGORIES OF LAND USE (BUILT UP AREA)	AREA IN SQ METRES (SQM)
Institutional Area	3922
Administrative Area	747
Amenities Area	1372
Circulation Area	1091
<b>TOTAL AREA</b>	<b>7132.54</b>



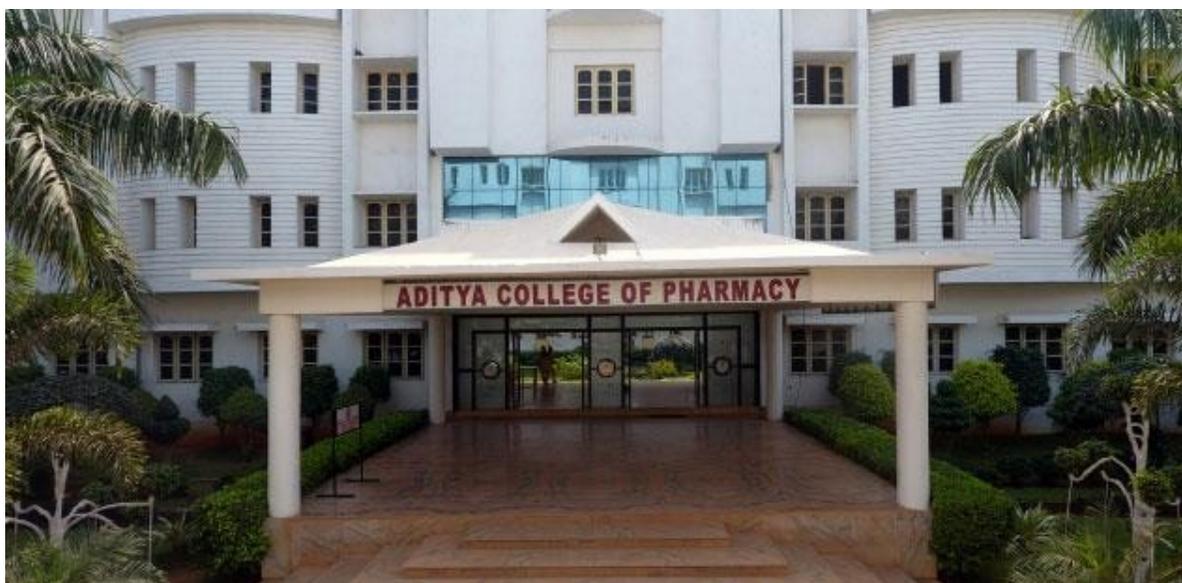
The institutional area sums up to 3922 sq. meters, followed by amenities area 1372 Sq. meters. Circulation Area is 1091 sq. meters and the administrative area occupy 747 sq meters.

ACoP College, which was established in the year 2006, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Its land use is such that about 17.5 % of the total area is occupied by open land and plantation that generates a better and sustainable campus environment.

## TREE DIVERSITY OF ACoP, Surampalem

ACoP College is within the geo-position between latitude 17.0891248 N, and longitude 82.07033429 East Surampalem, 30 Km from Kakinada city India. It encompasses an area of about 02 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.



ACoP campus is having total green area of **02 acres**

### **Below stated information is provided by the college management team:**

- ACoP 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 gardener. Organic fertilizers and pesticides are used for plants if necessary.



## ELECTRICAL POWER CONSUMPTION AT ADITYA COLLEGE OF PHARMACY

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

No. of pumps – Borewell and sump pumps –

BOREWELL	Total 16 HP (3 Pumps i.e.3HP+10HP+3 HP)
Sump	7.5HP

No. of building – Names with no. of rooms in each building

S.No.	Name of the Building	No. of Rooms
1	ADITYA COLLEGE OF PHARMACY	17

Hostel details, no. of rooms, no. of students staying – inventory of lights, fans

S.No	Hostel Block	Rooms	Students	Fans	CFL	LED
1.	a	2	2	4	4	4
2.	b	57	91	120	116	116
3.	c	5	7	10	10	10
4.	d	27	56	54	54	54
5.	e	8	9	16	16	16

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

S.No.	Name of the Building	Fans each 80Watt	C.F.L 10Watt	Tube Lights 40Watt	AC 1.5 Ton
1	ADITYA COLLEGE OF PHARMACY	245	41	203	03

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

Capacity : 500KW  
 No. of units generated: 6,37,405 (From 01/01/22 To 31/12/22)  
 Consumption : 2,96,871  
 Export : 3,40,534

:  
3,

**Renewable energy:** There is a Rooftop solar PV System of 500 KW capacity has been installed to cater to the energy needs of the college.



The college has also started using clean energy since 2019 from the 500 KW solar power plant installed near the college. It has produced 825285 units of clean energy during 2022.

## WEATHER DATA OF Kakinada: ACoP

Month-wise weather data of Kakinada City (30 Km from Surampalem ACoP) For the year 2022

Month	Max Temp (C°)	Min Temp (C°)	Precipitation (mm)
January	34.6	20.3	12.6
February	37.8	21.7	10.3
March	40.0	24	7.5
April	42.8	26.2	16.4
May	46.9	27.8	42.3
June	47.4	27.3	122.8
July	41.7	26.2	175.4
August	38.4	25.9	176.9
September	37.9	25.9	199.4
October	37	24.8	243.
November	35.9	22.5	98.8
December	34	20.3	10.7

From the above table, it is evident the temperature is high in the month of June and low in the month of December. The rain fall is high during the month of September and low in the month of February.

## AIR QUALITY IN KAKINADA: ACoP

The climate of ACoP college campus located at Surampalem near Kakinada city outskirts. It was noticed the college is away from the bustling city Kakinada and the campus is fully green with many trees and plantations.

Air Quality determination

**Satisfactory:** Air quality index (OVERALL 62) in **Rajamahendravaram weather station (34 km from Surampalem), India**

The air quality index is found 142 as per the publicly available data for the month December 2020. This indicates moderate air quality. However, as the ACoP 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) 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.

## **WATER ANALYSIS REPORT OF ACoP**

ACoP 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. REJECT**

R.O. plant water reject is used for watering plants in the institution and hostels.

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.

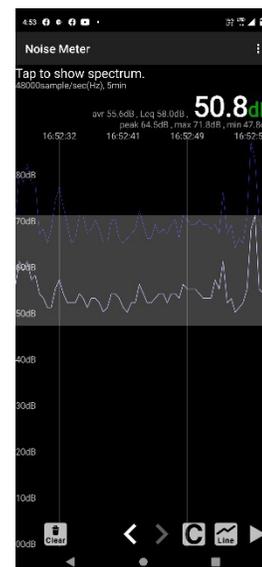
**Wastewater:** Wastewater is mainly generated from toilet flushing and kitchens. Wastewater generated from academic blocks as well as hostels is collected in septic tanks and passed to surrounding trees and plants through canals.

### ***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 ACoP.**

Institute site visit observations, revealed that the noise levels were found within the permissible limits.



## **WASTE MANAGEMENT AT ACoP**

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 'SwachhBharat 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 as food waste, kitchen waste after peeling the vegetables and garden waste etc.

**Dry Waste:** Dry waste can be categorized into different wastes such as plastic waste, 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 books 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. ACoP has Learning Management System (LMS) where notices are sent, exam results are displayed and attendance is recorded digitally.

Other good practices followed by ACoP are provided below:

- Biometric attendance is provided for ACoP staff.
- Paper notices are displayed on the notice boards. The dissertation reports, journals, and answer papers are stored as per the University rules.
- ACoP 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.

Below information is obtained from the college:

Pollution from waste is aesthetically displeasing 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 College of Pharmacy took major steps

to manage the waste to protect and create a clean and pleasant environment. The departments as well as administrative offices generate 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, Hostel 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 ACoP campus. ACoP discourages use of plastic; particularly single use plastics in campus. Paper wastes from departments, Library, Administrative offices, Hostels, 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, ACoP 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 & staff portal 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. 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. ACoP 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. ACoP 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. ACoP organizes guest lectures on Environmental conservation, biodiversity, etc. every year.

ACoP has a demonstrated consistent commitment towards nature and environment. ACoP 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 ACoP 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 ACoP for increasing awareness about indoor air pollution. E.g. Signage can be put 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, ACoP can install water meter on borewell line to monitor daily borewell withdrawal.
- Implementation of the STP could reduce the dependency on the ground water.