



Global Green Solutionz

509, Block A, Emerald Heights, Annojiguda, Hyderabad 500088

Tel: +91-7331134789; Email: globalgreensolutionz@gmail.com

May, 2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, we have conducted environmental audit at M/S Aditya Pharmacy College for the academic year 2022-23, Aditya Nagar, Surampalem, East Godavari District to identify various sustainable measures to conserve various resources in the institution operations. Environmental Audit Report is submitted to the management.

For Global Green Solutionz

M. Srikanth



Srikanth Meesa,

CEO, Global Green Solutionz



[Signature]

PRINCIPAL
Aditya Pharmacy College
500088

ADITYA PHARMACY COLLEGE

Approved by AICTE & PCI – NEW DELHI, Affiliated to JNTU KAKINADA
(Formerly known as Aditya Institute of Pharmaceutical Sciences & Research)

Ph: 98665 76663
Email: office@adityapharmacy.edu.in
Website: www.adityapharmacy.edu.in

ENVIRONMENT AUDIT REPORT

2022-2023

ADITYA PHARMACY COLLEGE(APC)



Prepared BY



Global Green Solutionz
Greening the globe

Global Green Solutionz

D.No: 509, Block A, Emerald Heights, Annojiguda, Hyderabad-500088

Tel: +91-7331134789;

Email: globalgreensolutionz@gmail.com;

www.globalgreensolutionz.in



PRINCIPAL
Aditya Pharmacy College
SURAMPALM-533 437

CONTENTS

S.No.	Titles/Topics	PageNo.
1	INTRODUCTION	4
2	OBJECTIVES	4-5
3	METHODOLOGY	5
4	ABOUT THE COLLEGE	7
5	LAND USE ANALYSIS, ADITYA PHARMACY COLLEGE(APC), SURAMPALEM	8
6	TREE DIVERSITY OF ADITYA PHARMACY COLLEGE,SURAMPALEM	10
7	ELECTRICAL POWER CONSUMPTION AT ADITYA PHARMACY COLLEGE	12
8	WEATHER DATA OF ADITYA PHARMACY COLLEGE	14
9	AIR QUALITY IN ADITYA PHARMACY COLLEGE	15
10	WATER ANALYSIS OF ADITYA PHARMACY COLLEGE	16
11	NOISE LEVEL IN THE SURROUNDING OF ADITYA PHARMACY COLLEGE	16
12	WASTE DISPOSAL OF ADITYA PHARMACY COLLEGE	17
13	GREEN INITIVATES	19
14	RECOMMENDATIONS/SUGGESTIONS	20



ACKNOWLEDGEMENT

Global Green Solutionz (GGS) is thankful to the management and staff of Aditya Pharmacy College (APC) for awarding Environment 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 Environment audit.


For Global Green Solutionz



INTRODUCTION

Environment audit was initiated in the beginning of 1970s with the motive of inspecting the work conducted within 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. Environment 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 environment 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. Environment 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 to 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 environment Audit Report.



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

OBJECTIVES:

The main objective of the environment audit is to promote the Environment Management and Conservation in the College Campus. In recent time, the Environment 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 environment 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 environment 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 environment 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, environment 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 environment audit.

Environment 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 Environment 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.



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437



Step Under Environment Audit:

- **Plan the audit:** Environment auditing related data was collected during March and April 2023
- **Select the audit team:** APC has hired Global Green Solutionz (GGS) to conduct the Environment 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 APC campus.
- **Acquire the background information:** GGS team has interviewed the appointed environment 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 Environment 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

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 secured 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.Pharm) 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, 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.




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437



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	414
2	PHARM.D	137
3	M.PHARMACY- Pharmaceutics	3
4	M.PHARMACY- Pharmaceutical Analysis	4
Total		558

It is approved by AICTE, recognized by Govt. of Andhra Pradesh, 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) of the UGC Act.


LAND USE ANALYSIS, ADITYA PHARMACY COLLEGE, SURAMPALEM, 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 earth system, 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.




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437



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 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 APC, Surampalem

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

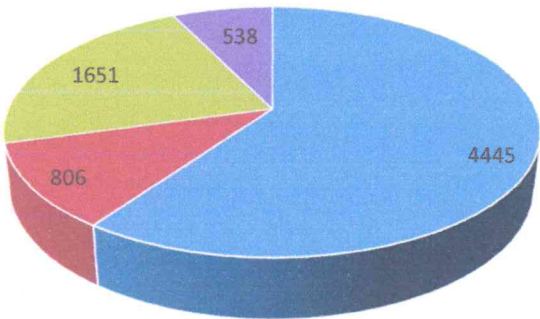


PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

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

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.

APC 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.




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 490

TREE DIVERSITY OF APC, Surampalem

APC 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 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.



APC campus is having total green area of **2.5 acres**

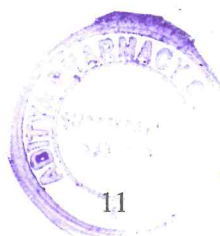


PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-522 202



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 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 : 400KVANo. of

pumps –

Borewell and sump pumps –

BOREWELL	4X5HP=20HP
Sump	4X5HP=20HP

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

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 50Watt	C.F.L 10Watt	Tube Lights 20Watt	AC 1.5 Ton
1	ADITYA PHARMACY COLLEGE	280	53	223	05

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

Capacity : 500KVA
No. of units generated: 7,99,350 (From 01/01/22 To 31/12/22)Consumption : 3,80,477
Export : 2,11,328



[Signature]

PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-522 101

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 2018 from the 500 KW solar powerplant installed near the college. It has produced 12435745 units of clean energy during 2022 - 23.



PRINCIPAL
Aditya Pharmacy College
SURAMPAL EM-533 437

WEATHER DATA OF Kakinada: APC

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

Month	Max Temp (C ⁰)	Min Temp (C ⁰)	Precipitation (mm)
January	33	20	16
February	33	23	0
March	41	28	7.11
April	43	28	3.05
May	45	33	57.41
June	42	29	227.58
July	36	25	274.57
August	37	28	150.89
September	37	27	213.11
October	34	23	308.9
November	32	22	89.6
December	33	23	33.03

From the above table, it is evident the temperature is high in the month of may and low in the month of january. The rain fall is high during the month of October and low in the month of February.

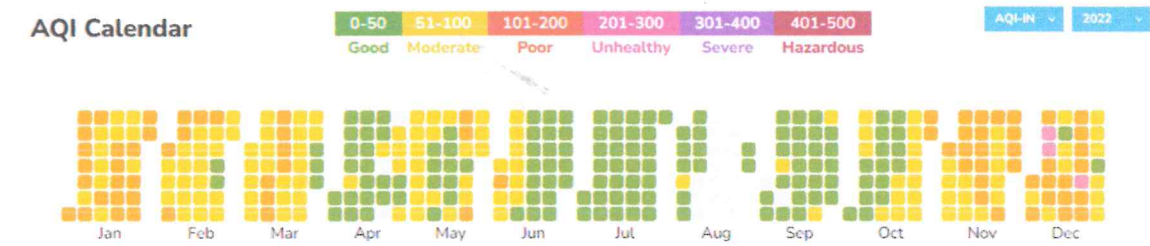


PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-522

AIR QUALITY IN Rajamahendravaram : APC

The climate of APC college campus located at Surampalem near rajamahendravaram city outskirts. It was noticed the college is away from the bustling city rajamahendravaram 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**



Rajahmundry - Locations Air Pollution Level						
LOCATIONS	Status	AQI-US	PM2.5	PM10	Temp	Humid
Dowlaiswaram Industrial Estate Rajahmundry	MODERATE	74	23	44	33	28

The air quality index is found 142 as per the publicly available data for the monthDecember 2022. 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) 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.





PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

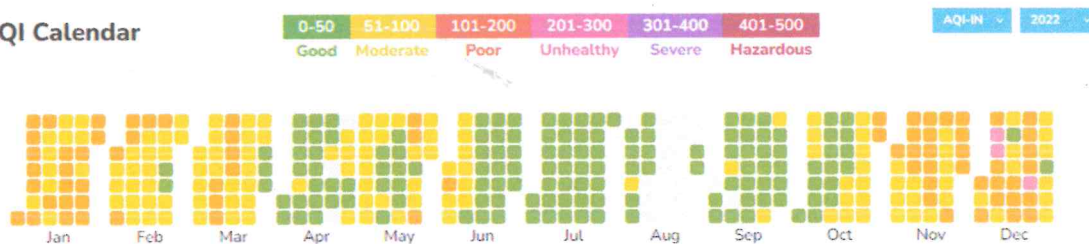
AIR QUALITY IN Rajamahendravaram : APC

The climate of APC college campus located at Surampalem near rajamahendravaram city outskirts. It was noticed the college is away from the bustling city rajamahendravaram 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**

AQI Calendar



Rajahmundry - Locations Air Pollution Level

LOCATIONS	Status	AQI-US	PM2.5	PM10	Temp	Humid
Dowlaiswaram Industrial Estate Rajahmundry	MODERATE	74	23	44	33	28


The air quality index is found 142 as per the publicly available data for the month December 2022. 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) 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.




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

WATER ANALYSIS REPORT OF APC

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. REJECT

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

Environment audit team noticed that the drinking water quality was found good and potable.

Environment 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.

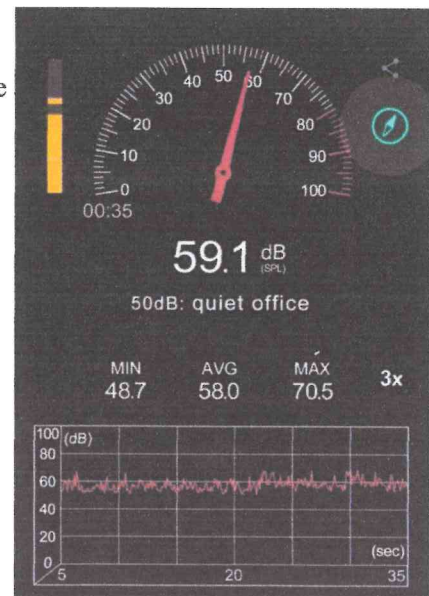
Wastewater: Wastewater is mainly generated from toilet flushing and kitchens. Wastewater generated from academic blocks is collected in septic tanks and passed to surrounding trees and plants through canals.

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 the permissible limits.



16
PRINCIPAL
Aditya Pharmacy College
CONTACT NO: 533 437

WASTE MANAGEMENT AT APC

Management of solid waste is an important driver in Environment 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 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 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.

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 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 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 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 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 offers wide spectrum of environmental and nature activities and platforms to enhance awareness and exhibit the relationship with nature. Various activities organized by NSS group of APC organizes various programmes like awareness programmes, campaigns on green initiatives, plantation camps in college and nearby villages.



is




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437



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




PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

Energy Audit Study Of



ADITYA
PHARMACY COLLEGE

ADITYA PHARMACY COLLEGE

(Permanently Affiliated to JNTUK, Kakinada, Approved by AICTE, New Delhi)

Recognized by UGC under Sec 2(f) and 12 (B) of the UGC Act 1956

Aditya Nagar, ADB Road, Surampalem- 533437

April 2023

Study Conducted and Prepared by:



KR Energy Consultants

Flat No.103, SS Ajay Arcade, Doctors Colony,

Saroor nagar, Hyderabad-500035

Email: krenergy@rediffmail.com, Mobile: +91-9440234294

www.krenergyconsultants.com




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

Contents

Acknowledgement

Executive Summary

Chapter 1: Introduction.....07

- 1.1 About Aditya Pharmacy College
- 1.2 Energy Conservation Efforts made by the Management
- 1.3 Objectives of the Energy audit
- 1.4 Scope of the Work
- 1.5 Methodology Adopted for conducting the Energy Audit Study
- 1.6 Measuring Instruments used during the Energy Audit

Chapter 2: Energy Consumption & Analysis,12

- 2.1 Energy Inputs
- 2.2 Electrical Energy Analysis
- 2.3 GHG Emissions
- 2.4 Solar Power Plant – GHG Emission Reductions
- 2.5 Power Factor and Maximum Demand
- 2.6 DG sets
- 2.7 Harmonics

Chapter 3: Fans & Air conditioners.....18

- 3.1 Details of Fans
- 3.2 Fans- Observations & recommendations
- 3.3 Air Conditioners
- 3.4 Air Conditioners –Observations & recommendations




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

Chapter 4: Lighting23

4.1 Details of Lighting

Chapter 5: Miscellaneous25

5.1 Pumps – Observations & recommendations

5.2 General Observations




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437 3 | Page

Acknowledgement

KR Energy Consultants (called "**KR Energy**") hereafter) places on record, its sincere gratitude to the Management of **M/s Aditya Pharmacy College**, for entrusting the prestigious project of Energy Audit of their College located at Surampalem, ADB Road, East Godavari District, AP State.

We also wish to thank the officers/ Executives & staff of the institute for providing necessary support extended during energy audit study.



T KRISHNA
BEE Certified Energy Auditor no.3398
KR Energy Consultants
Hyderabad
Date: April 21, 2021



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

Executive Summary

M/s KR Energy Consultants has conducted a Detailed Energy Audit of M/s Aditya Pharmacy, Aditya Nagar, Surampalem, EG District, AP in April 2023 to identify energy savings measures for reducing energy consumption and electricity bill.

Electricity and HSD are main energy sources for the institute. Grid electricity supply by APEPDCL is the main source of electrical energy, which is augmented with power generation from DG Sets during load shedding:

The institute has also solar power plant of 500 kW capacity for captive use for the entire campus requirement

a) Electrical Energy

Table A: Profile of Electrical Energy Consumption

S. No.	Item	Value
1	Contract Maximum Demand (CMD) kVA	200
2	Solar power plant capacity of the campus, kW	500
3	Solar generated units, kWh	611,329
4	Solar college consumed units, kWh	386,003
5	Solar export units, kWh	225,326
6	Power import units, kWh	363,624
7	Bill units, kWh	172,197
8	Bill amount, Rs.	2107,134
9	Net bill after adjustment, Rs.	2285,613
10	College used amount, Rs. lakhs	45.53
11	Solar saving amount, Rs. lakhs	37.41

b) Summary of Recommendations

The Tables below presents the summary of recommended energy saving projects, anticipated energy savings, and monetary savings, investment required, and simple payback period:



PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

Table 1: Summary of Suggested Energy Saving Measures with Cost-Benefit Analysis

Energy Conservation Measure	Energy savings (kWh/ year)	Monetary savings (Rs. / year)	Investment (Rs.)	Payback period (months)
Replace old fans with Energy efficient/Super fans (100nos)	6,000	60,000	180,000	36
Install energy savers for ACs	1,215	12,150	15,000	15
Replace conventional CFLs with LED lights	75	750	1,000	16
Replace old pumps with new efficient pumps(1 no's)	1,440	14,400	40,000	32
Total	8,730	87,300	2,36,000	32

- As can be observed from the above Table, the total electrical energy savings are estimated at 8,730 kWh/year and the corresponding monetary savings are Rs.0.87 lakh/year. The investment required is Rs.2.36 lakhs which will be paid back in 32 months.
- Equivalent CO₂ reductions due to energy savings would be 7 tCO₂/yr
- Initially, the fans, ACs and tube lights operated for more hours in a day/year can be selected for replacement for maximum benefit.



[Signature]
PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

CHAPTER 1

Introduction

1.1 About Aditya Pharmacy College

Aditya, the premier promoter of quality education in the coastal districts of Andhra Pradesh for the past two decades, leads various institutions ranging from K.G to P.G besides professional colleges like Engineering, Pharmacy and Nursing. Sri Nallamilli Sessa Reddy as a founder chairman, promoted the educational society in the name and style of Aditya Academy at Kakinada in the year 1984, with a vision and mission to create a platform for holistic growth and success to students at all levels.

Aditya has made its entry into the educational arena with a public school to meet the needs of primary and secondary education. In succession and with rapid strides, the academy established several Junior Colleges, Degree Colleges, PG Colleges, Engineering Colleges, Pharmacy Colleges, Nursing Colleges, Teacher Training Institutions.

The silver-jubilee educational group with 50,000+ students in 50+ institutions with 5000+ staff across three districts in Andhra Pradesh has become the standard bearer for quality education. In every stream, Aditya has become a spring-board for success through its powered vision, constant innovation, and professional excellence.

Aditya Pharmacy College

The Aditya Pharmacy College 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 organised in different colleges and present seminars and poster presentations and secured prizes for their participation.

Distinguished scientists from noted industries such as Hetero Drugs, Shantha Biotech, Dr.Reddy's and Aurobindo Pharma visit the college and present guest lectures and seminars and there is an active placement cell which facilitates the process of the students getting recruited in various companies.

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.Pharm) 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. It is approved by AICTE, recognized by Govt. of Andhra Pradesh, 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) of the UGC Act. It is an ISO 9001:2015 certified Institution.

The following courses are offered in the college for under graduation and graduation 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	414
2	PHARM.D	137
3	M.PHARMACY	07
Total		558

1.2 Energy Conservation Efforts made by the Management

The committee of the institute recognizes its responsibility to conserve and manage energy in all its operations.

- ✓ Make every effort to commit organizational resources towards energy management
- ✓ Minimize energy costs and give priority to energy efficiency (EE) by utilizing available resources more efficiently

Towards this objective, the management has installed LED lighting and Solar Power Plant of 500 kW for captive use of power for the entire campus covering for all colleges of the group institutions.

The management wants to explore further scope for energy conservation and energy cost reduction in the campus and thus entrusted the job of Energy audit to KR Energy Consultants.



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

1.3 Objectives of the Energy Audit

The key objectives of the Energy audit is to identify, prioritize, and recommend a set of proven, customized, low-cost, and implementable measures for reducing the consumption of electrical energy in the campus and emission reductions.

1.4 Scope of Work

The Energy audit has laid emphasis on performance assessment of electrical utilities comprising the following equipment/ areas for identification of cost-effective energy saving solutions:

- 1) Energy Consumption and Analysis
- 2) Pumps (Utility)
- 3) Air Conditioners
- 4) Fans
- 5) Lighting
- 6) DG sets

1.5 Methodology Adopted for conducting the Energy Audit study

KR Energy Consulting has conducted Energy audit field studies at the institute during April 2023. As a part of the Energy audit KR Energy Consulting audit team has visited campus for data collection, on-site measurements, and performance monitoring of various equipment using portable Energy audit instruments. KR Energy Consulting has adopted the following methodology for conducting the Energy audit:

- ➔ Kick-off meeting with the concerned personnel to finalize field action plan
- ➔ Inventory of all the electrical appliances installed by physical verification like air conditioners, luminaries, computers, and others. Physical inspection of the electrical distribution system.
- ➔ Monitoring of electrical parameters such as voltage, amps, kW, power factor etc. for individual equipment's and feeders
- ➔ Monitoring of harmonics at the identified DB's, feeders UPS with power and harmonic analyzer
- ➔ Collection of photocopies of monthly electricity bills for the past one year
- ➔ Critical analysis of data collected/ measured and assessment of energy efficiency and energy losses
- ➔ Identification of energy saving measures and assessment of energy saving potential
- ➔ Submission of the report



PRINCIPAL
Aditya Pharmacy College
SURAMPALFM-533 437

The approach/ methodology adopted for Energy audit is presented pictorially below in Figure 1.

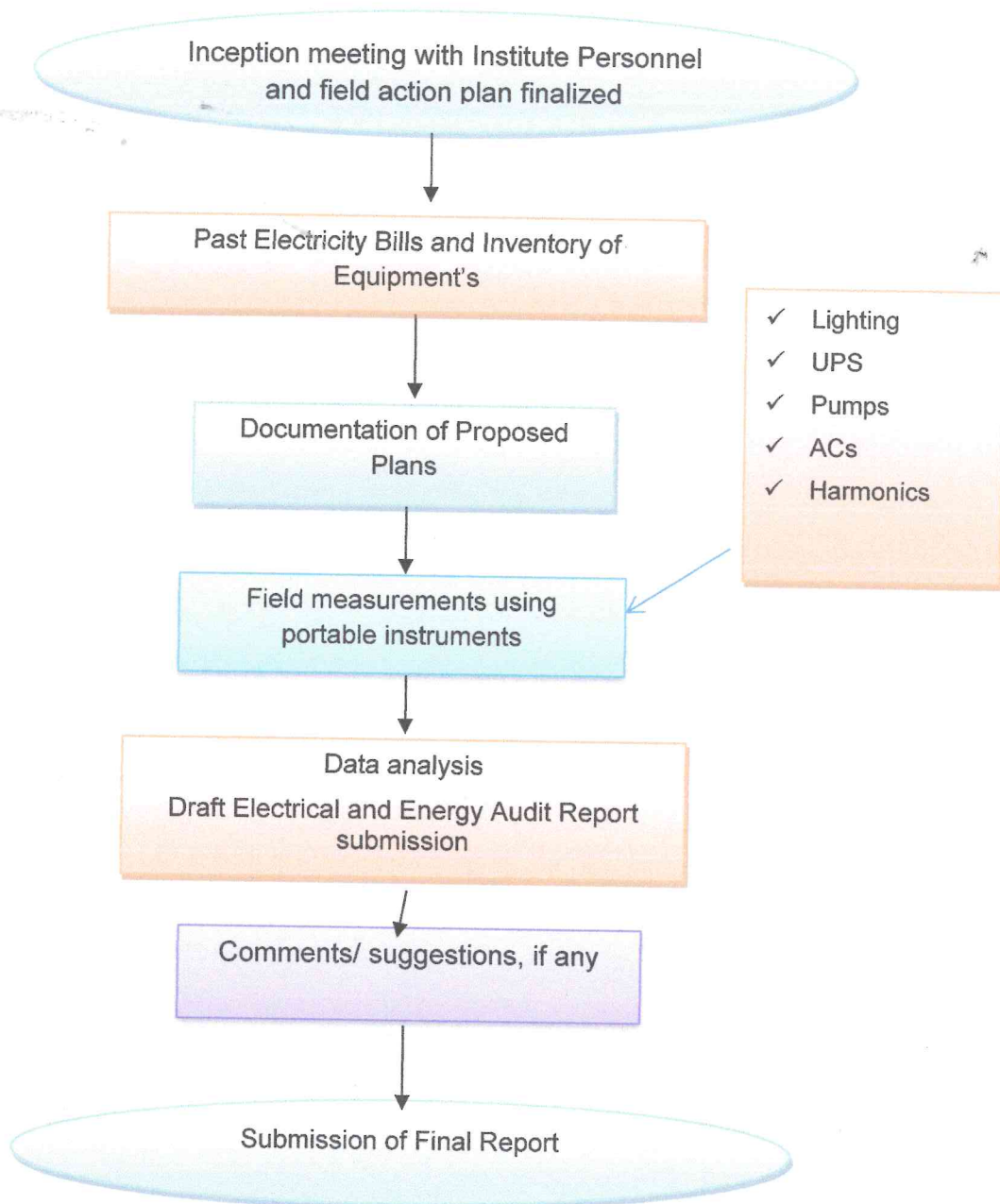


Figure 1: Approach/ methodology adopted for conducting Energy Audit of Aditya Pharmacy College, Surampalem, ADB Road, East Godavari District, AP State

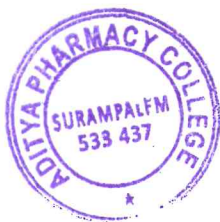


PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

1.6 Measuring Instruments used for the Electrical and Energy Audit

KR Energy Consulting has used portable, micro-processor based, state-of-the-art, calibrated instruments for on-field monitoring of equipment performance during Energy audit. The list of portable instruments used in the study is as follows:

- Nanovip Plus Load Manager
- Harmonic Analyzer
- Lux meter
- Temperature measuring instruments
- Thermal Imager




PRINCIPAL
Aditya Pharmacy College
SURAMPALFM-533 437

CHAPTER 2

Energy Consumption & Analysis

The chapter presents the description of various energy inputs used in the Institute, their consumption trends & analysis, annual energy costs, and share of different energy inputs in total energy cost.

2.1 Energy Inputs

Energy sources for the hotel utilities are:

- Electricity
- HSD

Electricity is major energy source for the institute for lighting, fans, motors etc.

DG Sets are used as standby to grid power and will run during load shedding. HSD is the fuel for DG Sets.

The campus has a roof top solar power plant also of 500 kW and electricity generated is used for captive purpose for the entire campus and all colleges power requirement.

2.2 Electrical Energy Analysis

Grid electricity is supplied by the AP Eastern Power Distribution Company Limited (APEPDCL) voltage of 11kV. The connection meets the entire campus electricity requirement including all colleges of the group in the campus. During grid power shortage/ failure, DG Sets supply the required electricity. The institution has a Contract Maximum Demand (CMD) is 200 kVA for the entire campus.




PRINCIPAL
Aditya Pharmacy College
SURAMPALFM-533 437

Data on monthly billed units, solar energy consumed units and bill amount for period year from January 2022 to December 2022 is collected, analyzed, and presented in Table 2.1 below:

Table 2.1: Month-wise solar and grid electricity consumption (Jan 2020 to December 2020)

S.NO	Month	Grid Import Units	Bill Units	College Solar Consumption
1	Jan-22	18690	4000	21261
2	Feb-22	23010	4000	31211
3	Mar-22	41026	18214	40440
4	Apr-22	42337	28704	44657
5	May-22	41783	28381	39412
6	Jun-22	40276	29986	36343
7	Jul-22	24292	14852	30203
8	Aug-22	22206	6632	31397
9	Sep-22	26279	11753	29355
10	Oct-22	20253	4000	27541
11	Nov-22	33573	12835	29062
12	Dec-22	29899	8840	25121
		363624	172197	386003

The summary of the grid electricity, solar generation, export, captive use, and electricity bill is furnished below Table 2.2:

Table 2.2: Summary of Electrical Energy Scenario (Solar and Grid)
(Jan 2022 to December 2022)

S.No	Details	Value
1	Solar generated units, kWh	611,329
2	Solar college consumed units, kWh	386,003
3	Solar export units, kWh	225,326
4	Power import units, kWh	363,624
5	Bill units, kWh	172,197
6	Bill amount, Rs.	2107,134
7	Net bill after adjustment, Rs.	2285,613
8	College used amount, Rs. lakhs	45.53
9	Solar saving amount, Rs. lakhs	37.41



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

As can be seen from above, the solar energy is completely utilized by the college and surplus electricity is exported to the grid. Due to use of solar energy, about 574 tons of CO₂ emissions has been reduced by the management to the atmosphere and supporting sustainable development and creating awareness of solar energy to the society. The management has reduced electricity bill by Rs.37.41 lakhs per year.

The grid electricity is almost avoided and hence reducing transmission and distribution losses.

The variation of electricity consumption, recorded demand, billed demand, solar power, and power factor demand is graphically furnished in fig 2.1. 2.2, and 2.3

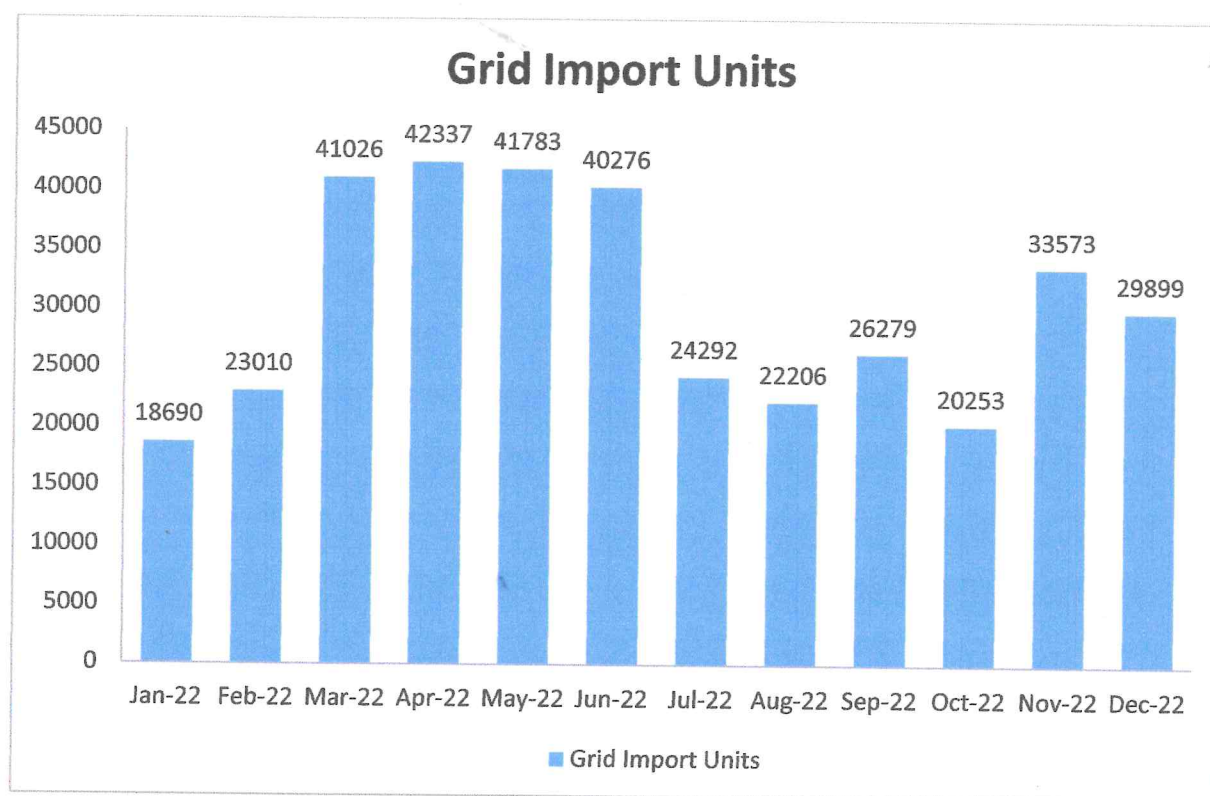


Fig 2.1: Monthly Grid Import Units



PRINCIPAL
Aditya Pharmacy College
SURAMPAL-533 437

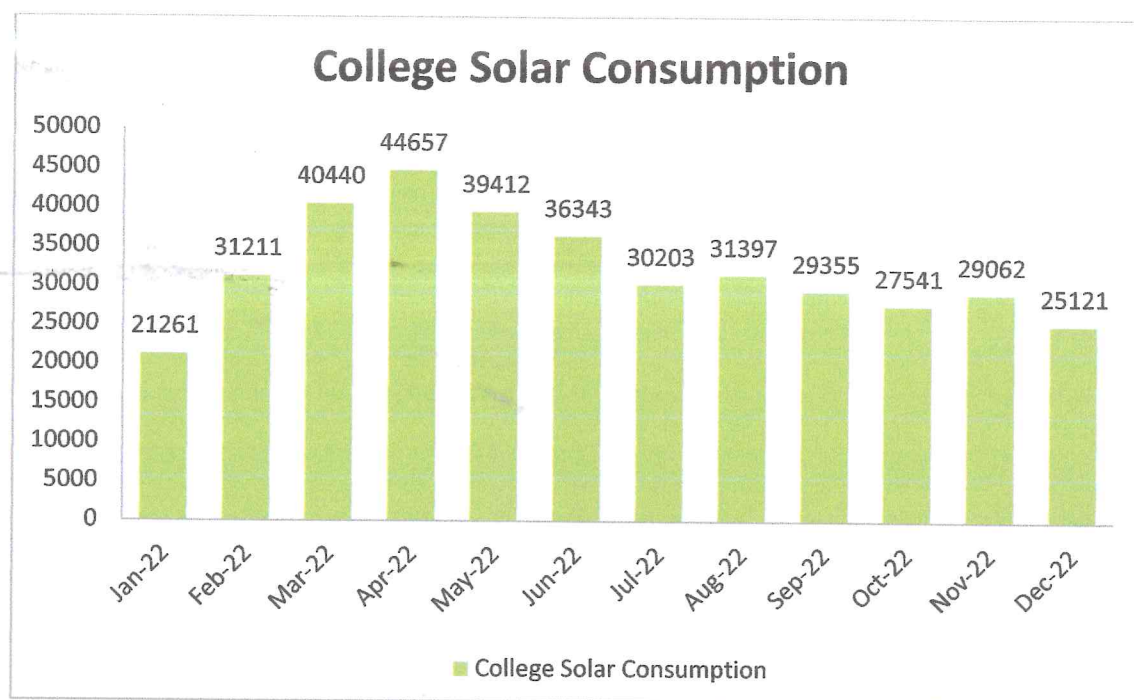


Fig 2.2: Monthly College Solar Consumption

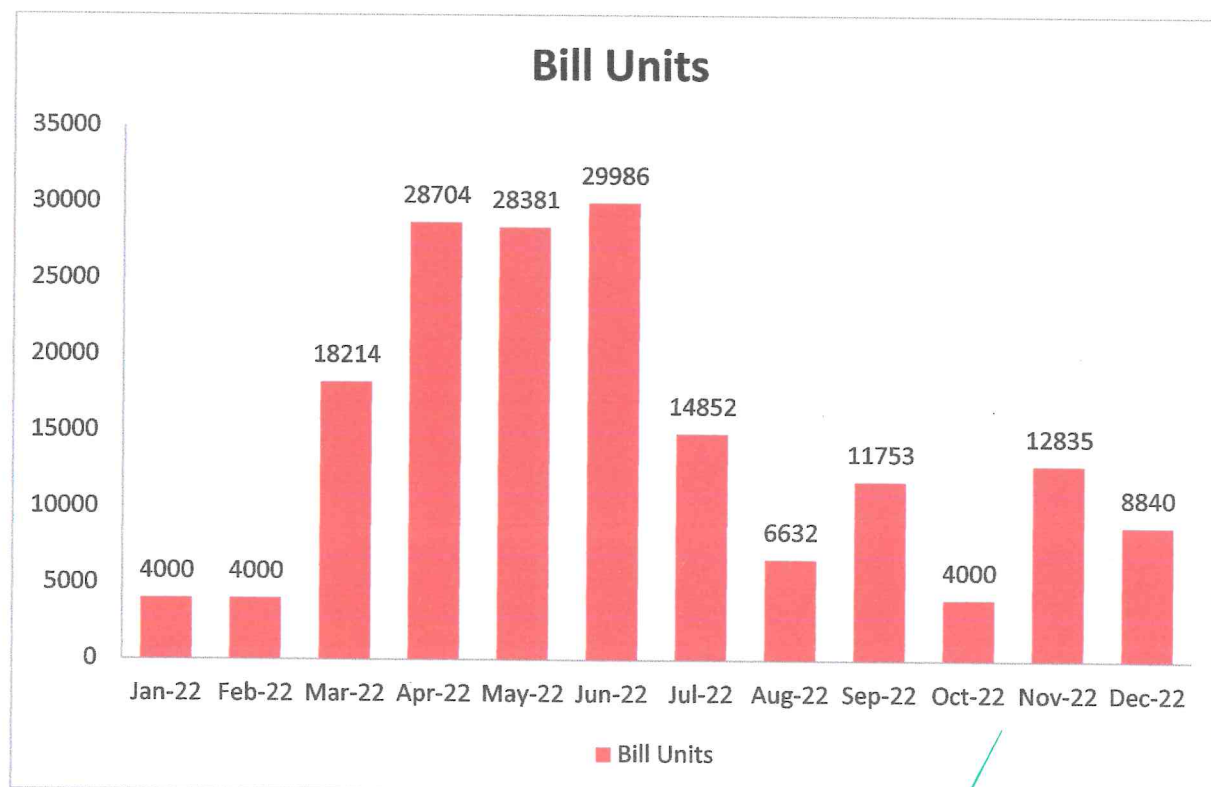


Fig 2.3: Monthly Grid Units (Minimum)



PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

The key observations made from the analysis of the above data are furnished in Table 2.2 below:

Table 2.2: Summary of Electrical Energy Consumption Data of Aditya Pharmacy College – (January 2022 – December 2022)

S. No.	Item	Value
1	Contract Maximum Demand (CMD) kVA	200
2	Solar power plant capacity of the campus, kW	500
3	Solar generated units, kWh	611,329
4	Solar college consumed units, kWh	386,003
5	Solar export units, kWh	225,326
6	Power import units, kWh	363,624
7	Bill units, kWh	172,197
8	Bill amount, Rs.	2107,134
9	Net bill after adjustment, Rs.	2285,613
10	College used amount, Rs. lakhs	45.53
11	Solar saving amount, Rs. lakhs	37.41

2.3 Solar Power Plant GHG Emissions Reduction

The management has installed a roof top SPV Power plant as an initiative to offset GHG emissions to the world. The capacity of the SPV power plant is 500 kW with net metering facility.

So far, about 611 MWh has been generated from January 2022 to December 2022, the solar power is used for captive requirement for the campus, the power is also exported to grid during holidays. Due to solar power plant, about 574 tons of CO₂ is avoided to the climate every year and is almost offset of the grid power used during the same period.

2.5 Power Factor and Maximum Demand

(a) Contract Demand

- Contract Maximum Demand is 200 kVA and minimum billing demand is 160 kVA. The billing demand is always less than 160 kVA and never crossed and is OK.
- The maximum demand is OK for the present utilization and is satisfactory.



PRINCIPAL
Aditya Pharmacy College
SURAMPAL-EM-533 437

- The minimum billing demand is 80% of the CMD and is 160kVA

(b) Power Factor

The average monthly power factor was 0.99 as noted and as per electric bills. The power factor is well maintained and is OK.

2.6 DG Sets

The institution has three DG sets for total campus load of 400 kVA (1 no's). The DG sets are operated as per the requirement and during grid power failures. which is sufficient to cater the load of the entire campus loads and is OK

2.7 Harmonics

This term refers to a wide variety of electromagnetic phenomena that characterize the voltage and current at a given location of a power system any power problem manifested in voltages, current, or frequency deviations those results in failure or malfunctioning of customer equipment. Power quality has become increasingly important for industrial and commercial electric power customers, particularly as today control processes rely on computerized equipment which is sensitive to power system interruptions and disturbances.

As harmonic levels increase, the likelihood of experiencing problems also increases. Typical problems include:

- Malfunctioning of microprocessor-based equipment by disruptions of operations.
- Heating effects in power handling equipment's such as motors, transformers, overheating in neutral conductors. There by reduces the operating life
- Deterioration or failure of power factor correction capacitors.
- Erratic operation of breakers and relays.
- Pronounced magnetic fields near transformers and switchgear.



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

The harmonics were measured for the selected panels and UPS. The Voltage & Current harmonics are ranged as below:

Table 2.4 Harmonics Measurements values for Panel by Harmonic Analyzer

Reference	$THD_{rms,v}$	$THD_{rms,i}$
Main panel	0.43% to 1.0% Voltage Harmonics within the limits	3.0% to 10.5% 5 th Harmonic - 5% 7 th Harmonic - 5.4% 5 th and 7 th harmonics are predominant.
Recommendation	No Harmonics exists and harmonics are within the limits	




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

CHAPTER 3

Fans & Air conditioners

This chapter presents the type of air conditioners and fans used, their energy performance, and cost-effective energy conservation measures for reducing energy consumption in air conditioners and fans.

3.1 Details of Fans

The college has 280 fans of 50 Watt for class rooms, staff rooms, corridors, and other locations. The total connected load of the fans is 14 kW

3.2 Fans- Observations & recommendations

- ✓ Fans are provided with fixed and running capacitor. The speed drops if the value deteriorates with time. Timely replacement of capacitor is necessary.
- ✓ Presently, in many rooms conventional electrical regulators are installed and it is suggested to replace old conventional regulators with new electronic type regulators.
- ✓ In majority of the rooms, the fans are consuming more power than rated.

a) Cost benefit Analysis of Replacing old Ceiling Fans with new efficient fans or BLDC fans

Energy savings can be achieved by replacing the existing old ceiling fans with 5 Star Rating (BEE) energy efficient ceiling fans:

- ➔ Option 1: 5 Star rated Fans
- ➔ Option 2: Super Fans

Initially, it is recommended to replace old fans of 100 nos. and after successfully achieving the savings, other fans can be replaced in a phased manner. The cost benefit analysis made for a sample of replacement of 100 fans under two Options are furnished below:

i) Option (1) Replace old fans with 5 Star Rated Fans

Star Rating	Min. Air Delivery (AD) m ³ / min	Input Power in Watts	Service Factor (SV=AD/ Power) m ³ /min/Watt	Cost (Rs)
5 Star	215-225	50-53	≥ 4	1,850-2,200



A few good brands of the 5 Star rated Fans are Ortem, Relaxo, Orient, Usha, Crompton Greaves, Bajaj, and Havells. Normally, these fans come with a warranty of two years.

ii) **Option 2: Super-Efficient Ceiling Fans**

Features of Super-Efficient Ceiling fans are:

- Energy savings, more than 50% savings, lower electricity bill
- Remote control, no regulator needed, saves space on switchboard
- High air delivery
- Inverter/UPS friendly – Runs twice longer, no extra noise, no speed drop
- No speed change due to supply variations or low voltage
- Power factor better than 0.9
- Service value of more than 6 - more air per watt
- BLDC Motor runs cool - No heat generated
- LED Indication for remote operation
- Attractive colors and designer leaves
- 5 years warranty
- Cost Around Rs 3,200 per Fan

Presently, Super fan is the company, which manufactures these types of fans.

The comparison of ordinary fan, 5 star fan, and super fan in terms of design and operational aspects are furnished below in Table 3.1:

Table 3.1: Comparison between Ordinary Fan, 5 Star Rated fan & Super Fan (1200mm)

S.No	Parameter	Ordinary fan	5 Star rated Fan	Super fan
1	Rated Power, Watt	60-90	40	30
2	Min. Air Delivery, m ³ /min	210-215-220	215-220	220
3	Service Factor, m ³ /min/Watt	3.35-3.73	4.0-5.0	6.28
4	Cost, Rs/Fan	1200-1300	1800	2500
5	Life, Years	10-12	10-15	15
6	Warranty, Years	1	2	3-5

The cost-benefit analysis of replacing the existing ordinary fans with (i) 5 star rated fans and (ii) super-efficient fans is provided in Table 3.2:



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

Editor
Surampalem College
533 437

Table 3.2: Cost Benefit Analysis of Replacing Fans with 5 Star Rated & Super-Efficient Fans

Description	Unit	Option1: 5 Star Rated Fans	Option2: Super-Efficient Fans
Number of Fans (Considered 100 Nos. as sample for case study)	Nos.	100	100
Actual power consumed	Watts	70	70
Power consumption of new Fan	Watts	40	30
Average operation	hours/day	8	8
	Days/year	250	250
Annual energy savings	kWh/yr.	6,000	10,000
Cost of energy	Rs/kWh	10	10
Total Annual saving	Rs	60,000	1,00,000
Cost of new Efficient fans	Rs/Fan	1,800	2,500
Investment	Rs	1,80,000	2,50,000
Simple Payback period	Months	36	30

Note: Price is subjective and be further reduced if taken on bulk quantity. The average life of fans is 10 years.

Initially, the management can replace 100 no's in first phase and after successfully achieving savings and recurring savings, all the fans can be replaced for power savings.

3.3 Air conditioners

The air-conditioning systems available at Institute are of split air conditioners. There are total of 3 air conditioners in the college. The rated capacity of AC's are 1.5 TR and total capacity is 4.5 TR. The total connected load of ACs is 5.4 kW

3.4 Air conditioners -Observations & Recommendations

(a) Observations

- It is beneficial to install 5 Star rated ACs in future as 5 star rated ACs will consume less power than 3 star rated, and additional investment is less as compared to the savings. Air conditioners over 10 years can be replaced with new 5 star rated ACs.



PRINCIPAL
Aditya Pharmacy College
SURAMPAL-533 437

(b) Recommendations

(i) Install Energy Saver for ACs

Airtron is the most advanced AC SAVER with all the controls of a Precision AC.

Airtron's dual sensors reference the Room and Coil Temperature and working in tandem with its multiple algorithms in a "closed-loop circuit" ensure the high savings and adapts your AC to Ambient Temperatures and Climatic changes, by maintaining room temperature while compressor run time is substantially reduced.

Airtron allows to program the AC to climate & geographical locations and automatically adjusts itself to change the ambient conditions to save electricity. AIRTRON is available with a Remote for setting the Room Temperature and in Non-Flammable Polycarbonate Enclosure with SMPS Power Supply, to tolerate wide Voltage and Current fluctuations, Surges, Spikes and Sags.



Airtron has been validated on all ACs- Inverters, 5 Star, Splits, Multi-Splits, Packages, Ductable, Windows, Cassettes from 1.0 - 20.0 TR.

The salient features of Airtron AC saver are:

- ✓ Most advanced AC saver
- ✓ Display Room & Coil Temperature
- ✓ Automatically adapts AC to changes in ambient temperature & Climate
- ✓ Easy to install
- ✓ Applicable on ACs from 1.0 to 20TR, saves equally on inverters & 5 Star/ 1-Star AC's
- ✓ Energy saving up to 15 to 20%





PRINCIPAL
Aditya Pharmacy College
SURAMPAL-EM-533 437

Table 3.3: Cost-benefit Analysis - Installation of AC Saver

Description	Unit	Value
Total number of ACs	Nos.	3
Total AC load	kW	5.4
No. of hours of operation/day	Hours/day	6
No. of days per annum	Days/year	250
Annual Energy Consumption	kWh/year	8100
Power saving due to AC Saver @15%	kWh/year	1215
Annual monetary savings(@Rs.10.0 per kWh)	Rs.	12,150
Investment for AC Savers (@Rs.5,000 x 3 no's)	Rs.	15,000
Payback period	Months	15

3.4.1 Best Practices for Efficient Operation Air Conditioners

- *False ceiling:* good quality false ceiling must be maintained in the air conditioned rooms by keeping all doors and windows closed properly to prevent cool air go out and hot air come in.
- *Curtains:* Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.
- *Maintenance:* Proper maintenance and cleaning of ACs is required at regular intervals to make it work at highest efficiency. Any dirt in filter may reduce efficiency of ACs very significantly.
- *Operation:* ACs should be switched on 15 minutes before actual use and should be switched off before leaving the room
- Outdoor units need to be kept under shady area and direct expose to sunlight will increase the power consumption of the compressor
- AC false ceiling to be provided for the AC rooms, for better air conditioning and reduction of room area and reducing heat losses

By adopting the above measures, a minimum of 10% to 15% of electricity consumption by ACs can be reduced.



PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

CHAPTER 4

Lighting

4.1 Details of Lighting

Lighting system was assessed through visual observation and technical specification data were noted. The inventory data of the luminaries was provided by the department. The total lighting load of the unit is considerable of the total electrical load of the unit and hence, lighting needs equal emphasis along with other energy consuming areas. The college has the following types of luminaries as under:

- LED Tube Lights
- CFLs

Table 4.1: Lighting load details

S.No.	Type of luminary	Watts	Nos	Total load kW
1	LED tube lights	20	223	4.460
2		10	53	0.53
3				
4				
	Total		276	4.99

Majority of the tube lights LED tube lights in the institution, and some are CFLs. The total connected load of lighting is 4.99 kW. It is suggested to replace the CFLs with LEDs bulbs or lights. The cost benefit analysis is furnished below:



PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437

Table 4.2: Cost benefit Analysis of replacing CFLs with LEDs.

Description	Unit	CFLS
Total number of CFLs	Nos.	10
Wattage	W	10
No. of hours of operation/ day	Hours/day	6
No. of days per annum	Days/year	250
Annual Energy Consumption	kWh/year	150
Power saving due to LEDs @50%	kWh/year	75
Annual monetary savings(@Rs.10.0 per kWh)	Rs.	750
Investment for LED 5W light (@Rs.100/- per bulb or light	Rs.	1,000
Payback period	Months	16



PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

CHAPTER 5

Miscellaneous

5.1 Pumps-Observations & recommendations

There 8 no's of pumps of catering to water requirements of the Institute, all pumps are non-star rated and it is suggested to replace the non-star rated pumps with 5 star rated pumps for energy savings. These pumps can be replaced on phase wise, as and when required when pumps will be problem. The total connected HP of the pumps is 40 HP. Normally 2 or 3 pumps will be in operation as per the requirement.

Cost benefit analysis of replacing existing old pumps with new efficient star rated pumps provided in table 5.1 below for a 5.0 HP Pump:

Table 5.1: Cost benefit analysis of replacing old Pumps with EE pumps

Description	Unit	Value
Capacity of the pump	kW	3.7
Efficiency	%	40
Efficiency of 5 star rated pump	%	60
Savings	%	33
Power savings	kW	1.2
No. of hours of operation/ day	Hours/ day	4
No. of days per annum	Days/ year	300
Power saving due to Energy efficient 5 star rated Pumps	kWh/ year	1440
Annual monetary savings (@Rs. 10 per unit)	Rs	14,440
Investment for pump	Rs	40,000
Payback	Months	32

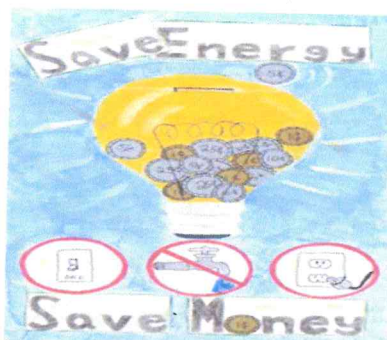


PRINCIPAL
Aditya Pharmacy College
SURAMPAL-533 437

5.2 General Observations

All Class Rooms, hostel rooms and laboratories to have Display Messages or Posters regarding optimum use of electrical appliances in the room like, lights, fans, computers, and projectors. Few sample posters is furnished below:

(a) Sample Posters for Awareness towards Energy Conservation



Also have stickers/labels of

slogans/lines for energy saving in Class rooms/ Common areas

- Energy saved is energy produced.
- Switch of Lights/ Fans if not used
- Conservation: It doesn't cost. It saves.
- Spare a Watt; Save a Lot
- Save Today. Survive Tomorrow
- Energy misused cannot be excused

(b) Safety posters



PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437



Global Green Solutionz

509, Block A, Emerald Heights, Annojiguda, Hyderabad-500088
Tel: +91-7331134789; Email: globalgreensolutionz@gmail.com

May, 2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, we have conducted green audit at M/S Aditya Pharmacy College for the academic year 2022-23, Aditya Nagar, Surampalem, East Godavari District to identify various green measures to conserve various resources in the institution operations. Green Audit Report is submitted to the management.

For Global Green Solutionz

M. Srikanth



Srikanth Meesa,

CEO, Global Green Solutionz



[Signature]
PRINCIPAL
Aditya Pharmacy College
Surampalem, East Godavari District
500 088, Tel: 572 437

ADITYA PHARMACY COLLEGE

Approved by AICTE & PCI – NEW DELHI, Affiliated to JNTU KAKINADA
(Formerly known as Aditya Institute of Pharmaceutical Sciences & Research)

Ph: 98665 76663
Email: office@adityapharmacy.edu.in
Website: www.adityapharmacy.edu.in

GREEN AUDIT REPORT

2022-2023

ADITYA PHARMACY COLLEGE(APC)



Prepared BY



Global Green Solutionz
Greening the globe

Global Green Solutionz

D.No: 509, Block A, Emerald Heights, Annojiguda, Hyderabad-500088

Tel: +91-7331134789;

Email: globalgreensolutionz@gmail.com;

www.globalgreensolutionz.in




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437



CONTENTS

Sl.No.	Titles/Topics	PageNo.
1	INTRODUCTION	4
2	OBJECTIVES	4-5
3	METHODOLOGY	5
4	ABOUT THE COLLEGE	7
5	LAND USE ANALYSIS, ADITYA PHARMACY COLLEGE(APC), SURAMPALEM	8
6	TREE DIVERSITY OF ADITYA PHARMACY COLLEGE, SURAMPALEM	10
7	ELECTRICAL POWER CONSUMPTION AT ADITYA PHARMACY COLLEGE	12
8	WEATHER DATA OF ADITYA PHARMACY COLLEGE	14
9	AIR QUALITY IN ADITYA PHARMACY COLLEGE	15
10	WATER ANALYSIS OF ADITYA PHARMACY COLLEGE	16
11	NOISE LEVEL IN THE SURROUNDING OF ADITYA PHARMACY COLLEGE	16
12	WASTE DISPOSAL OF ADITYA PHARMACY COLLEGE	17
13	GREEN INITIVATES	19
14	RECOMMENDATIONS/SUGGESTIONS	20





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
SURAMPAL-EM-533 437



INTRODUCTION

The term “Green” means eco-friendly or not damaging the environment. This 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 within 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.



PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437



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.



PRINCIPAL
Aditya Pharmacy College
SURAMPALÉM-533 437



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 stakeholders



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 secured 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.Pharm) 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, 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	414
2	PHARM.D	137
3	M.PHARMACY- Pharmaceutics	3
4	M.PHARMACY- Pharmaceutical Analysis	4
Total		558

It is approved by AICTE, recognized by Govt. of Andhra Pradesh, 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) of the UGC Act.




PRINCIPAL
Aditya Pharmacy College
SURAMPALAM-533 437



LAND USE ANALYSIS, ADITYA PHARMACY COLLEGE, SURAMPALEM, 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 earth system, 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)



(Signature)
PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437

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 APC, Surampalem

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

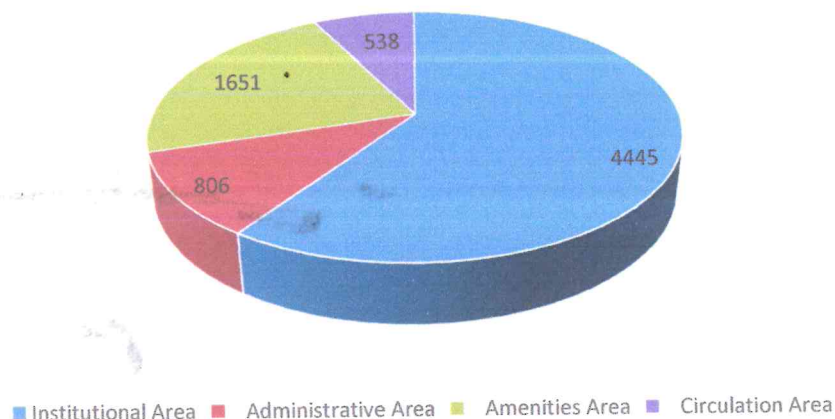


LAND USE (BUILT UP AREA) ANALYSIS:

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)



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.

APC 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 OF APC, Surampalem

APC 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 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.






APC campus is having total green area of **2.5 acres**

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 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	4X5HP=20HP
Sump	4X5HP=20HP

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

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 50Watt	C.F.L 10Watt	Tube Lights 20Watt	AC 1.5 Ton
1	ADITYA PHARMACY COLLEGE	280	53	223	05

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

Capacity : 500KVA
No. of units generated: 7,99,350 (From 01/01/22 To 31/12/22)
Consumption : 3,80,477
Export : 2,11,328

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.




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437



The college has also started using clean energy since 2018 from the 500 KW solar powerplant installed near the college. It has produced 12435745 units of clean energy during 2022.



**WEATHER DATA OF Kakinada: APC**

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

Month	Max Temp ⁰	Min Temp(C ⁰)	Precipitation(mm)
January	33	20	16
February	33	23	0
March	41	28	7.11
April	43	28	3.05
May	45	33	57.41
June	42	29	227.58
July	36	25	274.57
August	37	28	150.89
September	37	27	213.11
October	34	23	308.9
November	32	22	89.6
December	33	23	33.03

From the above table, it is evident the temperature is high in the month of May and low in the month of January. The rain fall is high during the month of October and low in the month of February.




PRINCIPAL
 Aditya Pharmacy College
 SURAMPALAM-533 437

**AIR QUALITY IN Rajamahendravaram: APC**

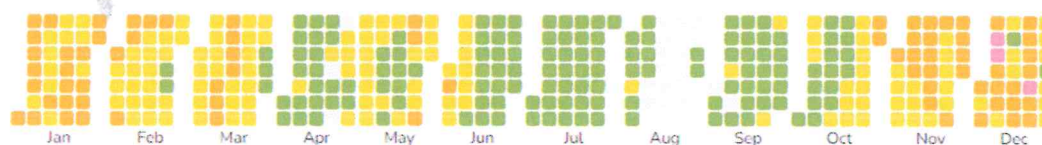
The climate of APC college campus located at Surampalem near Rajamahendravaram city outskirts. It was noticed the college is away from the bustling city Rajamahendravaram and the campus is fully green with many trees and plantations.

Air Quality determination

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

AQI Calendar

AQI-IN 2022

**Rajahmundry - Locations Air Pollution Level**

LOCATIONS	Status	AQI-US	PM2.5	PM10	Temp	Humid
Dowlaiswaram Industrial Estate Rajahmundry	MODERATE	74	23	44	33	28

The air quality index is found 74 as per the publicly available data for the month December 2022. 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) 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.



[Signature]
PRINCIPAL
Aditya Pharmacy College
SURAMPAL FM-533 437

WATER ANALYSIS REPORT OF APC

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. REJECT

R.O. plant water reject 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.

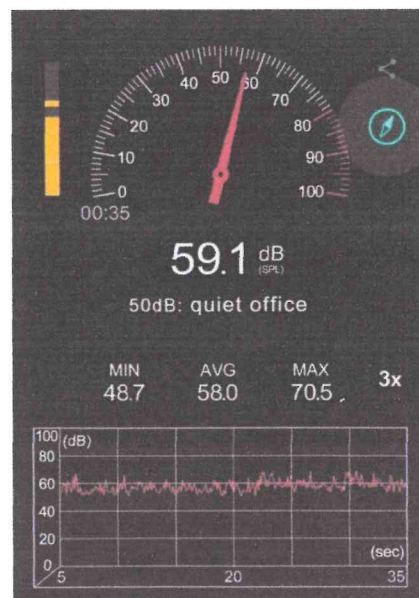
Wastewater: Wastewater is mainly generated from toilet flushing and kitchens. Wastewater generated from academic blocks is collected in septic tanks and passed to surrounding trees and plants through canals.

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.



WASTE MANAGEMENT AT APC

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 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. 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.

Below information is obtained from the college:

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 it's 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



Green Audit Report of Aditya Pharmacy College -2022-23



ADITYA
PHARMACY COLLEGE

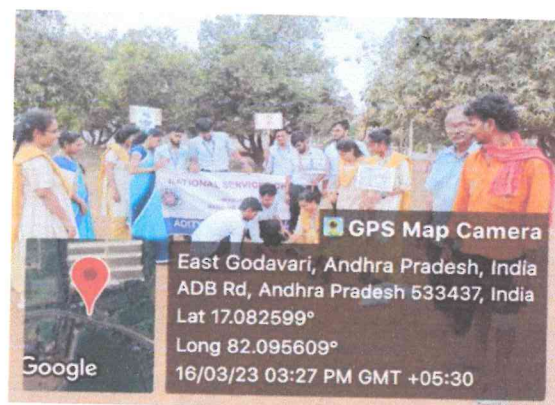
for students/ staff. Most of the staff pool buses and cars and a few staff members travel by private vehicles. APC management encourage students and staff to use the college buses or public transport system to reduce carbon emissions.

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 offers wide spectrum of environmental and nature activities and platforms to enhance awareness and exhibit the relationship with nature. Various activities organized by NSS group of APC organizes various programmes like awareness programmes, campaigns on green initiatives, plantation camps in college and nearby villages.



Principal
PRINCIPAL
Aditya Pharmacy College
SURAMPAL EMLE...



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




PRINCIPAL
Aditya Pharmacy College
SURAMPALEM-533 437