



Green Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23



GREEN AUDIT REPORT CONSULTATION REPORT



Anwarul Uloom College (Autonomous)

11-3-918, New Mallepally, HYDERABAD,
TELANGANA-500001

PREPARED BY

EMPIRICAL ENERGY PRIVATE LIMITED

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(2022-23)

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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of **Anwarul Uloom College, Hyderabad** for giving us an opportunity to conduct Green audit for the College

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.



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BUREAU OF ENERGY EFFICIENCY

Examination Registration No.: **EA-7271**

Accreditation Registration No.: **AEA-284**



Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at has been given accreditation as accredited energy auditor. The certificate shall be effective from **9th** day of **May, 2018**


The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No. **284** in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**


Secretary,
Bureau of Energy Efficiency
New Delhi



EXECUTIVE SUMMARY

Green Initiative Taken by College

+ VEHICLE POOLING:

Vehicle pooling promoted both among students and faculty and use of bicycles should be promoted as a policy of College It's **APPRECIABLE**.

AREAS FOR IMPROVEMENT

+ QR Code System on Tree:

While the world seems to be going digital, people lack the time to read books and process the information they contain. Hence, College can be provided QR codes on the trees for its information and to exploit the rapidly growing platform for a unique purpose.

+ Eco-restoration programmes

Frame a holistic campus development plan with long-term eco-restoration programmes for replacing exotic acacia plantations with indigenous trees.

+ OTHER SUGGESTIONS & RECOMMENDATION

Some of the very important suggestions are:-

- Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- Increase recycling education on campus.
- Increase Awareness of Environmentally Sustainable Development in college campus.
- Practice Institutional Ecology- Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development.



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- Collaborate for Interdisciplinary Approaches- To develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- Increase reduce, reuse, and recycle education on campus.
- Develop a butterfly garden that arouses appreciation towards flora and fauna diversity.
- Name all the trees and plants (Plant DNA barcodes) with its common name and scientific name.
- Arrange training programmes on environmental management system and nature conservation.
- Ensure participation of students and teachers in local environmental issues.
- Renovation of cooking system in the canteen to save gas by installation solar water heater system with heat pump.
- Avoid plastic/thermocool plates and cups in the college level or department level functions.



CHAPTER-1 **INTRODUCTION**

1.1 About College: -

Anwarul Uloom College was established in 1953. The Anwarul Uloom College under the Aegis of Anwarul Uloom Educational Association. The Anwarul Uloom College is an institute of knowledge, learning, excellence and humility, the institution with a vision of imparting education & empowering minority. This institution is with an adherence to principles. Anwarul Uloom is an institution with a great history and achievements, exemplary students from this institution have taken stride in the concept of education taking it forward to the next level by placing it on the global map with virtue and integrity.

The privilege of being The Largest Autonomous Minority Serving Institute in Telangana as one of its many feats including the distinction of glorious 109 years celebrations of its establishment - the noble act which is surely the stuff of dreams is achieved by Anwarul Uloom College. The meticulous institute has boarded the train of success and achieved this colossal feat with the hard work, determination and vision of its management and students and has vowed to never slow down its trail of achievements in the years to come. The college conducted its Grand Convocation Ceremony marking the 109 year celebration of its establishment rewarding its exemplary students with prestigious awards for their efforts. 118 students from various courses received their degrees for their overall excellence in academics and 18 students received gold medals for their extraordinary performance and overall personality exuberance showing path breaking achievements in the aspects of sports, academic, humanitarian endeavours and creativity.

Anwarul Uloom College is an Autonomous institution Affiliated to O.U the institution was granted autonomy by UGC in the year 1989. Anwarul Uloom College also have an accreditation of A Grade by NAAC- in 2017. The Institution runs a CBCS with Semester System pattern. Anwarul Uloom College has crafted an environment keeping in mind student requirements and market demand with a shift system to help them master theory concepts and strategies as well as develop and hone their skills in the field of corporate culture. Situated in the heart of the city with a sprawling 3 acre campus, spacious class rooms, laboratories, library, reading rooms conference halls , offering advanced courses in Retail marketing and diplomas in E commerce, training students in various aspects of personal growth and providing detailed and upgraded training modules for group 1 and 2 exams.



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Anwarul Uloom College is located in the heart of the city on the main road at Mallepally Hyderabad, Anwarul Uloom College has a campus area of 3,221 Sq Mtrs. The campus atmosphere is congenial for the holistic development of the students coming from varied backgrounds.

The academic quality of college life is enhanced by the provision of the best faculty and all possible infrastructural facilities for the benefit of the student community of minority community and other communities.

Anwarul Uloom College, Hyderabad is a very popular college in the state of Telangana. It is one of the leading college in Arts, Humanities and Social Sciences, Business Finance and Commerce, Management Studies and Science and Mathematics. It is located in Hyderabad, Telangana. Anwarul Uloom College, Hyderabad is a Private institution. More than 19 courses are taught in this institution.

Under the Arts, Humanities and Social Sciences, there are a total of 4 courses. For Under Graduate studies, B.A. (Economics) and B.A. are available for enrolment. For Post Graduate studies, M.A. (Economics) and M.A. (History) are available for enrolment.

Under the Business Finance and Commerce, there are a total of 6 courses. The Under Graduate category has 5 courses which are B.Com., B.Com. (Computer), B.Com. (E - Commerce), B.Com. (Hons.) and many more. For Post Graduate studies, M.Com. is the only course taught.

Under the Management Studies, 1 course is available. For Under Graduate studies, BBA is the only course taught. Under the Science and Mathematics, there are a total of 9 courses. For Under Graduate studies, B.Sc. and B.Sc. (Computer Science and Engg.) are available for enrolment. Under the Post Graduate studies, 7 courses are taught which are M.Sc. (Information Systems), M.Sc. (Physics), M.Sc. (Botany), M.Sc. (Chemistry) and many more.

Vision: -

To provide skill-based quality higher education by striving continuously for excellence in educational service to all sections of the society especially the minority students who are socially, economically and academically under privileged with the focus on empowerment of youth to contribute constructively towards the national goals by upholding the values of secularism, national integration and social commitment".



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Mission:

To provide higher education for empowerment of youth of Telangana State especially the marginalized people has been the main thrust of this college. The institution is committed to the under-privileged of the society and students with high potential facing difficult socio-economic circumstances, so as to bring them at par with mainstream. Our mission is to impart quality education and exposure for the holistic development of students and equip them to cope with the latest requirements, through innovative techniques and practices.

1.2 About College Campus:

The college is housed in a five different blocks with total built up area of around 35,000 Sq Ft.

The total area of the campus is 3,221 Sq Mtrs.

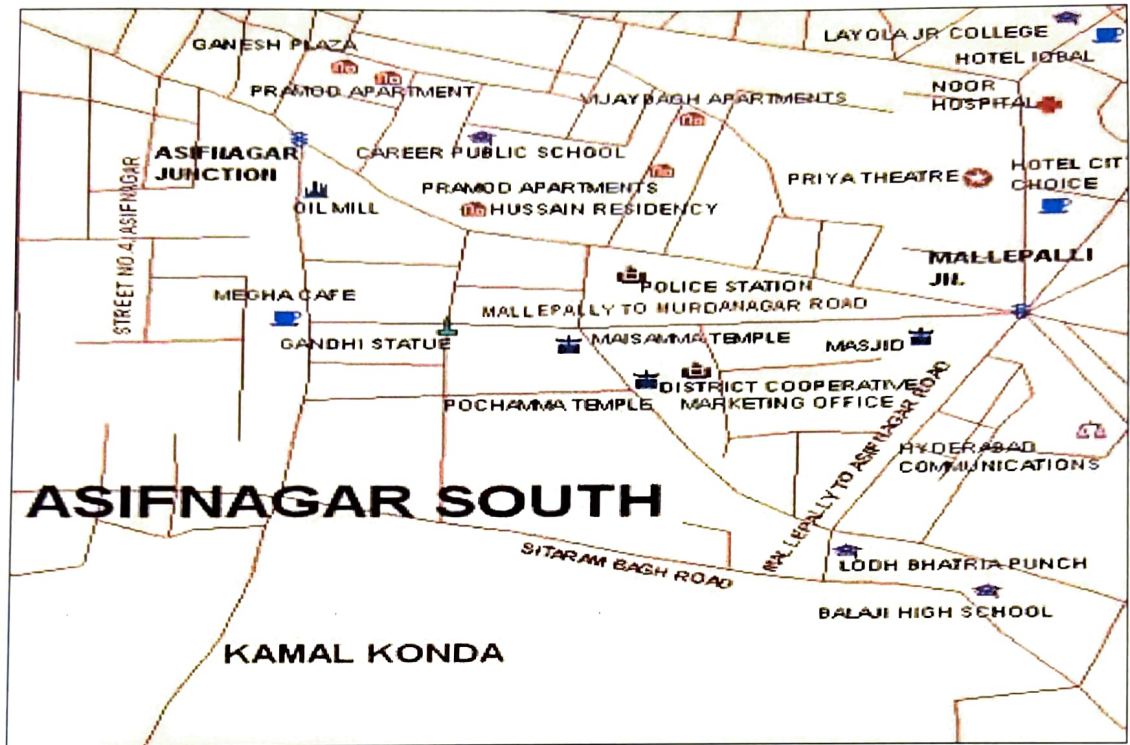




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Layout of College Buildings: -





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1.3 Green Monitoring Committee

Name	Position/Department
Principal	Mr. Mohammed Abdul Razzak
Director	Mr. Ahmed Baig
Director Administration	Mr. Mohd. Habeeb Uddin Ahmed
Biotechnology	Mrs. Nadeem Fatima
Botany	Dr. Sadia Fatima
Chemistry	Dr. Syeda Sameena Aziz
Computer Science	Dr. Ubaid Siddiqui
Computer Science &	
Engineering	Mr. Israr Ahmed
Economics	Dr. Neena Job
Electronics	Mr. Abaid Hussain
Political Science	Mrs. Asma Sadih
Public Administration	Mrs. Viqarunnisa
Nutrition & Dietetics	Mrs. Nazia Mohammedi
Microbiology	Dr. Majid Mohiuddin



1.4 About Green Auditing

Eco campus is concepts implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment.

Green audit means to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities achieve values of virtue. Green audit also provides a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs.

Green auditing of “**Anwarul Uloom College, Hyderabad**” enables to assess the life style, action and its impact on the environment. This green audit was mainly focused on greening indicators like utilisation of green energy (solar energy) and optimum use of secondary energy sources (petrol and diesel) in the College campus, vegetation, and carbon foot print of the campus etc. The aim of green auditing is to help the institution to apply sustainable development practices and to set examples before the community and young learners.

1.5 Objectives of Green Auditing

The general objective of green audit is to prepare a baseline report on “Biodiversity” and alternative energy sources (solar energy), measures to mitigate resource wastage and improve sustainable practices.

The specific objectives are:

- ✚ To suggest measures to make the College campus biodiversity rich
- ✚ To demarcate areas within the institute campus which have potential for restoration of biodiversity
- ✚ To make recommendations for the conservation, protection and rejuvenation of the natural vegetation and animal life by involving students and faculty members
- ✚ To inculcate values of sustainable development practices through green audit mechanism.
- ✚ Providing a database for corrective actions and future plans.
- ✚ To identify the gap areas and suggest recommendations to improve the green campus status of the College .

1.6 Target Areas of Green Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audit is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time.

Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency. Target areas included in this green auditing is biodiversity, green energy and carbon foot print.



1.7 Audit for Biodiversity

India is mega-biodiversity hottest hot-spot in the world with tremendous diversity in plants and animals. Such biotic forms are endemic to the different bio-geographic habitats in urban and in forest areas of the country as well. Biodiversity is defined as genetic, species and ecosystem diversity, which offers variability and therefore added values to bio-resources.

The most serious and rapidly accelerating of all the global environmental problems is the loss of biodiversity through deforestation and biodiversity cover depletion. Over the past 300 years, many species of organisms, including mammals, birds, butterflies and plants, have been lost due to many anthropogenic activities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen.

1.8 Audit of Green Energy:

According to the **Environmental Protection Agency (EPA)**, green energy provides the highest environmental benefit and includes power produced by solar, wind, geothermal, biogas, low-impact hydroelectric, and certain eligible biomass sources. Green energy can also reduce your carbon footprint and achieve a sustainable lifestyle.





CHAPTER- 2
GREEN CAMPUS AND BIODIVERSITY

2.1 Biodiversity Audit

In the survey, focus has been given on assessment of present status of diversity in form of plants, in college campus and efforts made by the College authorities for nature conservation. Campus is located in the vicinity of approximately more than 550 trees/ medicinal herbs/ ornamental plants. The detail is given below:

Figure :-2.1 Green Campus of College





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GREENING THE CAMPUS

1	Is there a garden in your institute?	Yes, about 1.5 Acre is the Green Area.	
2	Do students spend time in the garden?	2-4 Hours during winters	
3	Total number of Plants in Campus	Plant type	Approx. number
		Trees	More than 350
		Shrubs	More than 1000
		Grass Cover	1.5 Acre
4	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Ashoka, Ficus Religeosa, Boganvella, Alovera, Azadirachta indica , and many more as per geographical regime.	
5.	Is the College campus have any Horticulture Department	Yes	
	Number of Staff working in Horticulture Department	Five Gardeners	
6	Number of Tree Plantation Drives organized by College per annum. (If Any)	Yes, Three Tree Plantation Drives are Organized Annually. 50+ trees and 100+ shrubs planted in this financial year.	
7	Number of Trees Planted in Last FY.	80	
	Survival Rate	90%	
8	Plant Distribution Program for Students and Community	Yes, Seed Bank is developed and, Saplings are distributed to Students and visitors at various Occasions.	
9	Plant Ownership Program	No	



Chapter-03 **Carbon Foot print**

3.1 About carbon foot print.

Climate change is one of the greatest challenges facing nations, governments, institutions, business and mankind today.

Carbon footprint is a measure of the impact your activities have on the amount of carbon dioxide (CO₂) produced through the burning of fossil fuels and is expressed as a weight of CO₂ emissions produced in tonnes.

We focus on consumption in each of our five major categories: housing, travel, food, products and services. In addition to these we also estimate the share of national emissions over which we have little control, government purchases and capital investment.

For simplicity and clarity all our calculations follow one basic method. We multiply a use input by an emissions factor to calculate each footprint. All use inputs are per individual and include things like fuel use, distance, calorie consumption and expenditure. Working out your inputs is a matter of estimating them from your home, travel, diet and spending behaviour.

Although working out your inputs can take some investigation on your part the much more challenging aspect of carbon calculations is estimating the appropriate emissions factor to use in your calculation. Where possible you want this emissions factor to account for as much of the relevant life cycle as possible.

We all have a carbon footprint...





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3.2 Methodology and Scope

The carbon footprint gives a general overview of the **Anwarul Uloom College (Autonomous)** greenhouse gas emissions, converted into CO₂ -equivalents and it is based on reported data from internal and external systems. The purposes of the carbon indicators are to measure the carbon intensity per unit of product, in addition to showing environmental transparency towards external stakeholders. The carbon footprint reporting approach undertaken in this study follows the guidelines and principles set out in the “Greenhouse Gas Protocol Corporate Accounting and Reporting Standard” (hereafter referred to as the GHG Protocol) developed by the Greenhouse Gas Protocol Initiative and international standard for the quantification and reporting of greenhouse gas emissions -ISO 14064. This is the most widely used and accepted methodology for conducting corporate carbon footprints. The study has assessed carbon emissions from the **Anwarul Uloom College (Autonomous), Hyderabad**. This involves accounting for, and reporting on, the GHG emissions from all those activities for which the company is directly responsible. The items quantified in this study are as classified under the ISO 14064 standards: The report calculates the greenhouse gas emissions from the **Anwarul Uloom College (Autonomous), Hyderabad**. This includes electricity, as well as emission associated with diesel consumption in the institute vehicle. The emission associated with air travel, waste generation, administration, and marketing related activities has been excluded from the current study. Emissions from business activities are generally classified as scope 1, 2 or 3 areas classified under the ISO 14064 standards.

3.3 Carbon emission from electricity

Direct emissions factors are widely published and show the amount of emissions produced by power stations in order to produce an average kilowatt-hour within that grid region

Unlike with other energy sources the carbon intensity of electricity varies greatly depending on how it is produced and transmitted. For most of us, the electricity we use comes from the grid and is produced from a wide variety of sources. Although working out the carbon intensity of this mix is difficult, most of the work is generally done for us.

Electricity used in the site is the significant contributors towards GHGs emission from the unit. Electricity used onsite is the most direct, and typically the most significant, a contributor to a unit's carbon footprint. Thus, using an average fuel mix of generating electricity, carbon dioxide intensity of electricity for national grid is assumed to be 0.9613 KgCO₂/Kwh

(Reference: Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database
http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/database_11.zip) Electricity Purchased from the grid



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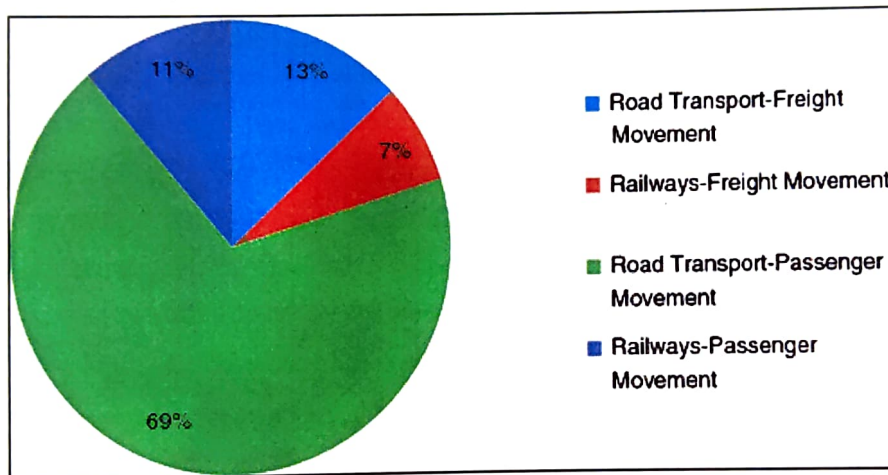


Table:- 4.1 Electricity Purchased from the grid and Emissions from the electricity Import

Sr. No	Parameter	Value	Unit	Emission Factor kg CO2e/kWh	Emission ton CO2e/year
1	Electricity	86150	kWh	0.9613	82.81
Total					82.81

3.4 Carbon emission from vehicles.

In India, it is the third most CO² emitting sector, and within the transport sector, road transport contributed more than 90% of total CO² emissions (IEA, 2020; Ministry of Environment Forest and Climate Change, 2018)



Transportation (29 percent of 2019 greenhouse gas emissions) – The transportation sector generates the largest share of greenhouse gas emissions. Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes.

we have also considered the total GHGs emission done by transportation facilities available in campus like Cars, Ambulance, Buses etc. We consider the different type of vehicles which are operated on petrol and diesel fuels

3.5 Other Emissions Excluded

This study did not evaluate the carbon sequestration potential of existing plantation activities and emission from the staff commuting, food supply, official flights, paper products, water supply, and waste disposal and recycling due to limited data availability. The current study identifies areas where data monitoring, recording and archiving need to be developed for enlarging the scope of mapping of GHGs emission in the future years. Accordingly, a set of tools and record keeping procedure will be developed for improving the quality of data collection for the next year carbon footprint studies



CHAPTER- 4 WASTE MANAGEMENT

4.1 About Waste:

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Waste management is important for an eco-friendly campus. In College different types of wastes are generated, its collection and management are very challenging.

Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste. A bio-degradable waste includes food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol.

Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the College. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus, the minimization of solid waste is essential to a sustainable College. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

Table 4.1 Different types of waste generated in the College Campus.

Sr. No.	Types of Waste	Particulars
1	Solid wastes	Damaged furniture, paper waste, paper plates, food wastes etc
2	Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc
3	E-Waste	Computers, electrical and electronic parts etc
4	Glass waste	Broken glass wares from the labs etc
5	Chemical wastes	Laboratory waste etc
6	Bio-medical Waste	Sanitary Napkin etc



4.2 Waste management Practices adopted by the College

College is implemented "Three dust Bin" waste collection system. All kind of waste generated from activity is collected.

Recommendation:

It is recommended adopted 5 Bin Waste Collection System for collect different type of waste generated premises.



Figure 4.2: Recommended 5 Dust Bin waste collection System

WASTE MINIMIZATION AND RECYCLING

1. Does your institute generate any waste? If so, what are they?	Yes, Solid waste, Canteen waste, paper waste, plastic waste, toiletry waste, Horticulture Waste, etc.			
	Bio Degradable	Non-Biodegradable	Hazardous	
2. What is the approximate amount of waste generated per day? (in Kilograms/month) (approx.)	40kg	4kg	1kg	



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<p>3. How is the waste generated in the institute managed? By</p> <ol style="list-style-type: none">1 Composting2 Recycling3 Reusing4 Others (specify)	<p>5 composting pits are there in campus, Reuse of one side printed Paper for internal communication. Sewage water is discharged to public Sewer. Domestic Waste is given to Municipal Corporation. Two types of Waste bins are provided at campus for biodegradable and non-biodegradable waste. Horticulture waste is also given to Municipal Corporation. Incinerator is used for managing sanitary waste.</p>
<p>4. Do you use recycled paper in institute?</p>	<p>Yes, in academic evaluation works</p>
<p>5. Do you use reused paper in institute?</p>	<p>Yes</p>
<p>6. How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.</p>	<p>Yes, Green Society carried out numerous activities. Recycling campaigns, e waste management, Anti- plastic campaigns, Varsha Vriksharopan, sustainable goal awareness programme.</p>
<p>7. Can you achieve zero garbage in your institute? If yes, how?</p>	<p>Yes, as per new waste management rules all kind of waste is managed in an adequate manner without any deviation.</p>



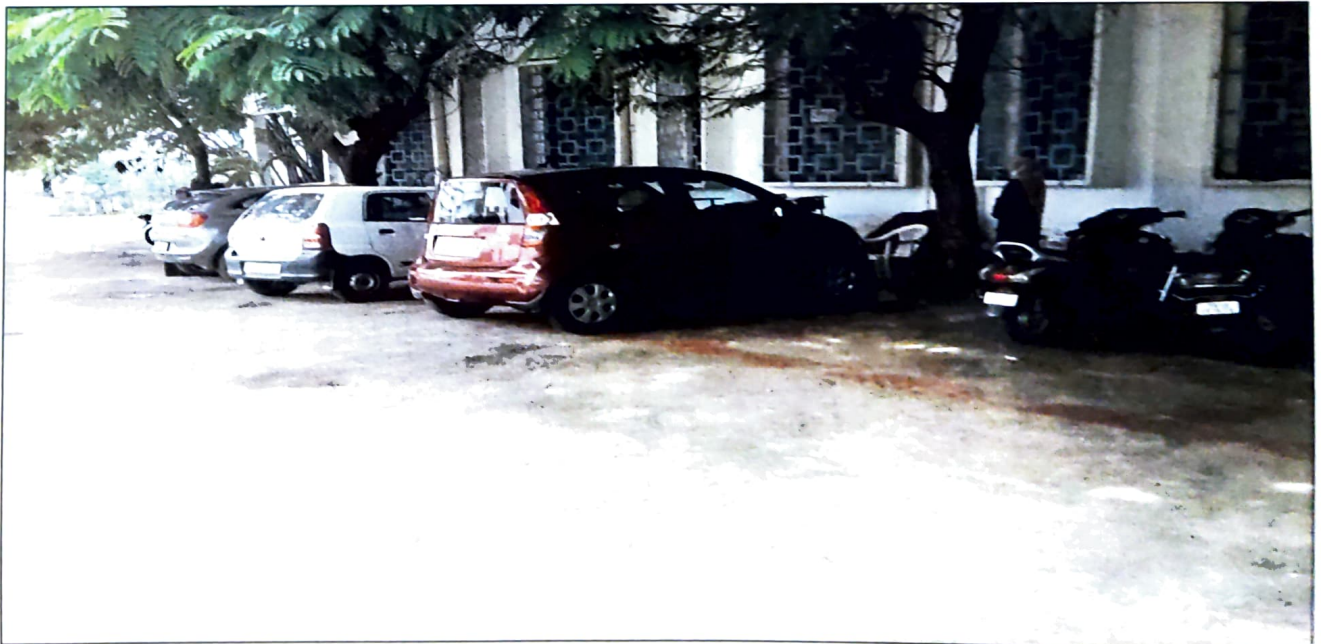
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Some plantation by Anwarul Uloom College, Hyderabad







CHAPTER- 5 RECOMMENDATIONS AND SUGGESTIONS

5.1 QR Code System and Biodiversity:

While the world seems to be going digital, people lack the time to read books and process the information they contain. Hence, College can be provided QR codes on the trees for its information and to exploit the rapidly growing platform for a unique purpose.



Fig: 5.1 QR Code System for plants

These codes can give students all the information they need to know about the tree — from its scientific name to its medicinal value. They only need to put their smart-phones to use. QR codes to them, making it easier for everybody to learn about a plant or a tree at the tip of their fingers,” If any app generating a QR code, which is available for free on the online stores, can be used to avail the information of the trees.

✚ Eco-restoration programmes

- Frame long-term eco-restoration programmes for replacing exotic Acacia plantations with indigenous trees and need of the hour is to frame a holistic campus development plan.



5.2 Other Suggestions

Some of the very important suggestions are: -

- ✦ Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- ✦ Increase recycling education on campus.
- ✦ Increase Awareness of Environmentally Sustainable Development in College campus.
- ✦ Practice Institutional Ecology- Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- ✦ Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development.
- ✦ Collaborate for Interdisciplinary Approaches- To develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- ✦ Increase reduces, reuse, and recycle education on campus.
- ✦ Develop a butterfly garden that arouses appreciation towards flora and fauna diversity.
- ✦ Name all the trees and plants (Plant DNA barcodes) with its common name and scientific name.
- ✦ Arrange training programmes on environmental management system and nature conservation.
- ✦ Renovation of cooking system in the canteen to save gas by installation solar water heater system with heat pump.
- ✦ Establish a procurement policy that is energy saving and eco-friendly.



END OF THE REPORT

THANKS



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ENERGY AUDIT REPORT

CONSULTATION REPORT



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1.7	Methodology
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2.1	Monthly Electrical Energy consumption Year 2021-22
Chapter- 3	Energy Conservation and Recommendation
3.1	Case Study No. 1
3.2	Case Study No. 1



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Lead Auditor ISO50001:2011 [EnMS) from FICCI, Delhi
Certified Water Auditor (NPC, Govt of India)
Chartered Engineer [M-1699118], The Institution of Engineers (India)
Member of ISHRAE [58150]



BUREAU OF ENERGY EFFICIENCY

Examination Registration No.: **EA-7271**

Accreditation Registration No.: **AEA-284**



Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at has been given accreditation as accredited energy auditor. The certificate shall be effective from **9th** day of **May, 2018**

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Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**

Secretary,
Bureau of Energy Efficiency
New Delhi



EXECUTIVE SUMMARY

The executive summary of the energy audit report furnished in this section briefly gives the identified energy conservation measures and other recommendation during the project that can be implemented in a phased manner to conserve energy, increase productivity inside the College campus.

AREA OF IMPROVEMENT

✚ LIGHTING SYSTEM

Replacement of “conventional T-12 (40 Watt) and T-8 (36 Watt)” tube light by energy efficient LED lighting fixture was taken up phased manner.

✚ TIMER CONTROLLED STREET LIGHTS

Installation of “Timer control on high mast and street lighting” in College campus is recommended.

✚ CEILING FAN AND EXHAUST FAN:

Replacement of “conventional ceiling fan (60 Watt to 80 Watt)” by energy efficient star rated fan or BLDC based energy efficient fan (20 to 25 Watt) in “admin building, class rooms, laboratories and faculties cabin” have great potential for energy saving.

Replacement of “conventional exhaust fan (90 Watt to 125Watt)” by energy efficient star rated fan or BLDC based energy efficient Fan (20 to 40 Watt) in old building class rooms, laboratories and faculties cabin have great potential for energy saving.

✚ IOT BASED ENERGY MONITORING SYSTEM AT MAIN FEEDER

- Installation of “Cloud based (IoT based) energy monitoring system” including harmonic measurement (total voltage and current harmonic distortion %) in power house will be good initiate for energy monitoring as well as student demo project for management. Expected energy saving potential about 2 to 4%.
- Installation of energy meters between transformer and main PCC panel with IOT system will monitor line losses of the system. It will give real time measurement of power factor and line losses from the cable.



✦ SYNCHRONIZATION OF DG SET WITH SOLAR SYSTEM

- Installation of “Cloud based fuel and unit generation monitoring system” in DG set will help to monitor specific unit generation by DG set failure of the grid power.
- It was observed that during the power failure of the grid, solar unit generations also stop. Synchronization of the solar system with DG set increases the utilization capacity of the solar system.

✦ TRANSFORMER LOSS OPTIMIZATION:

- Replacement of “existing conventional sub-station by new compact type sub-station” in HT yard is highly recommend to management to develop “Demo Project” in college will be technology up gradation as well as learning center for student and faculties.
- Replacement of existing transformer by “Energy efficient star rated transformer by BEE, Government of India or energy efficiency level-3” can be good project for management for energy saving as well as learning center for student and faculties.

✦ ENERGY MANAGEMENT WORKSHOP AND TRAINING:

- Develop energy management policies for university. Establish a procurement policy that is energy saving and eco-friendly.
- Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in energy management system.



CHAPTER-1 **INTRODUCTION**

1.1 About College: -

Anwarul Uloom College was established in 1953. The Anwarul Uloom College under the Aegis of Anwarul Uloom Educational Association. The Anwarul Uloom College is an institute of knowledge, learning, excellence and humility, the institution with a vision of imparting education & empowering minority. This institution is with an adherence to principles. Anwarul Uloom is an institution with a great history and achievements, exemplary students from this institution have taken stride in the concept of education taking it forward to the next level by placing it on the global map with virtue and integrity.

The privilege of being The Largest Autonomous Minority Serving Institute in Telangana as one of its many feats including the distinction of glorious 109 years celebrations of its establishment - the noble act which is surely the stuff of dreams is achieved by ANWARUL ULOOM COLLEGE. The meticulous institute has boarded the train of success and achieved this colossal feat with the hard work, determination and vision of its management and students and has vowed to never slow down its trail of achievements in the years to come.

ANWARUL ULOOM COLLEGE is an Autonomous institution Affiliated to O.U the institution was granted autonomy by UGC in the year 1989. Anwarul Uloom also have an accreditation of A Grade by NAAC- in 2017. The Institution runs a CBCS with Semester System pattern. Anwarul Uloom College has crafted an environment keeping in mind student requirements and market demand with a shift system to help them master theory concepts and strategies as well as develop and hone their skills in the field of corporate culture. Situated in the heart of the city with a sprawling 3 acre campus, spacious class rooms, laboratories, library, reading rooms conference halls , offering advanced courses such as BBA BBM BBA Artificial Intelligence and Data Science training students in various aspects of personal growth and providing detailed and upgraded training modules for group 1 and 2 exams.

Anwarul Uloom College is located in the heart of the city on the main road at Mallepally Hyderabad. The campus atmosphere is congenial for the holistic development of the students coming from varied backgrounds.

The academic quality of college life is enhanced by the provision of the best faculty and all possible infrastructural facilities for the benefit of the student community of minority community and other communities.



Energy Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23



Anwarul Uloom College, Hyderabad is a very popular college in the state of Telangana. It is one of the leading college in Arts, Humanities and Social Sciences, Business Finance and Commerce, Management Studies and Science and Mathematics. It is located in Hyderabad, Telangana. Anwarul Uloom College, Hyderabad is a Private institution. More than 19 courses are taught in this institution.

Under the Arts, Humanities and Social Sciences, there are a total of 4 courses. For Under Graduate studies, B.A. (Economics) and B.A. are available for enrolment. For Post Graduate studies, M.A. (Economics) and M.A. (History) are available for enrolment.

Under the Business Finance and Commerce, there are a total of 6 courses. The Under Graduate category has 5 courses which are B.Com., B.Com. (Computer), B.Com. (E - Commerce), B.Com. (Hons.) and many more. For Post Graduate studies, M.Com. is the only course taught.

Under the Management Studies, 1 course is available. For Under Graduate studies, BBA is the only course taught. Under the Science and Mathematics, there are a total of 9 courses. For Under Graduate studies, B.Sc. and B.Sc. (Computer Science and Engg.) are available for enrolment. Under the Post Graduate studies, 7 courses are taught which are M.Sc. (Information Systems), M.Sc. (Physics), M.Sc. (Botany), M.Sc. (Chemistry) and many more.

Vision: -

To provide skill-based quality higher education by striving continuously for excellence in educational service to all sections of the society especially the minority students who are socially, economically and academically under privileged with the focus on empowerment of youth to contribute constructively towards the national goals by upholding the values of secularism, national integration and social commitment".

Mission:

To provide higher education for empowerment of youth of Telangana State especially the marginalized people has been the main thrust of this college. The institution is committed to the under-privileged of the society and students with high potential facing difficult socio-economic circumstances, so as to bring them at par with mainstream. Our mission is to impart quality education and exposure for the holistic development of students and equip them to cope with the latest requirements, through innovative techniques and practices.



Energy Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23



1.2 About College Campus:

The college is housed in a five different blocks with total built up area of around 35,000 Sq Ft.
The total area of the campus is 3,221 Sq Mtrs.





Energy Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23



1.4 Energy Monitoring Committee

Name	Position/Department
Principal	Mr. Mohammed Abdul Razzak
Director	Mr. Ahmed Baig
Director Administration	Mr. Mohd. Habeeb Uddin Ahmed
Biotechnology	Mrs. Nadeem Fatima
Botany	Dr. Sadia Fatima
Chemistry	Dr. Syeda Sameena Aziz
Computer Science	Dr. Ubaid Siddiqui
Computer Science & Engineering	Mr. Israr Ahmed
Economics	Dr. Neena Job
Electronics	Mr. Abaid Hussain
Political Science	Mrs. Asma Sadiah
Public Administration	Mrs. Viqarunnisa
Nutrition & Dietetics	Mrs. Nazia Mohammedi
Microbiology	Dr. Majid Mohiuddin

1.5 Energy Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited**,

- ✚ **Mr. Rakesh Pathak**, [Director]
- ✚ **Dr. Suresh Soni** [Reviewer]
- ✚ **Mrs. Laxmi Raikwar Singadiya**,[Energy Engineer]
- ✚ **Mr. Sachin Kumawat** [Project Engineer]
- ✚ **Mr. Ajay Nahra**, [Site Engineer]



1.6 About Energy Audit

Energy audit helps to understand more about the ways energy is used in any plant and helps in identifying areas where waste may occur and scope for improvement exists. The overall energy efficiency from generation to final consumer becomes 50%. Hence one unit saved in the end user is equivalent to two units generated in the power plant.

Energy audit is the most efficient way to identify the strength and weakness of energy management practices and to find a way to solve problems. Energy audit is a professional approach in utilizing economic, financial, and social and natural resources responsibility. Energy audits “adds value” to management control and is a way of evaluating the system.

Empirical Exergy Private Limited (EEPL), Indore M.P. carried out the “Energy Audit” at the site to find gaps in the energy consumption pattern for **Anwarul Uloom College, Hyderabad**. A technical report is prepared as per the need and the requirement of the project.

1.7 Objectives of Energy Auditing

An energy audit provides vital information base for overall energy conservation program covering essentially energy utilization analysis and evaluation of energy conservation measures. It aims at:

- Identifying the quality and cost of various energy inputs.
- Assessing present pattern of energy consumption in different cost centers of operations.
- Relating energy inputs and production output.
- Identifying potential areas of thermal and electrical energy economy.
- Highlighting wastage in major areas.
- Fixing of energy saving potential targets for individual cost centers.
- Implementation of measures for energy conservation & realization of savings.



1.8 Methodology:

Methodology adopted for achieving the desired objectives viz.: Assessment of the current operational status and energy savings include the following:

- ✦ Discussions with the concerned officials for identification of major areas of focus and other related systems.
- ✦ Team of engineers visited the site and had discussions with the concerned officials / supervisors to collect data / information on the operations and load distribution within the plant and same for the overall premises. The data was analyzed to arrive at a base line energy consumption pattern.
- ✦ Measurements and monitoring with the help of appropriate instruments including continuous and / or time-lapse recording, as appropriate and visual observations were made to identify the energy usage pattern and losses in the system.
- ✦ Trend analysis of costs and consumptions.
- ✦ Capacity and efficiency test of major utility equipment's, wherever applicable.
- ✦ Estimation of various losses
- ✦ Computation and **in-depth analysis** of the collected data, including utilization of computerized analysis and other techniques as appropriate were done to draw inferences and to evolve suitable energy conservation plan/s for improvements/ reduction in specific energy consumption.



Energy Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23



CHAPTER- 2

ELECTRICITY BILL ANALYSIS

2.1 Monthly electrical energy consumption (2021-22):

The monthly electrical consumption for the College is given in the table.

Table 3.1 Energy consumption and billing amount (year 2021-22)

Sr. No	Month & Year	Total Unit Consumption (KW)	Total Amount (Rs/-)	Rs. /kWh
1	Nov-21	8924	101541	11.37
2	Dec-21	6949	71700	10.31
3	Jan-22	5160	59291	11.49
4	Feb-22	4901	58414	11.91
5	Mar-22	5769	66072	11.45
6	Apr-22	8229	93809	11.39
7	May-22	8050	147344	18.3
8	Jun-22	6614	77828	11.71
9	Jul-22	6628	80474	12.14
10	Aug-22	7753	88314	11.39
11	Sep-22	10084	140295	13.91
12	Oct-22	7089	92555	13.05
		Total = 86,150	Total = Rs.10,77,637	Average =12.36

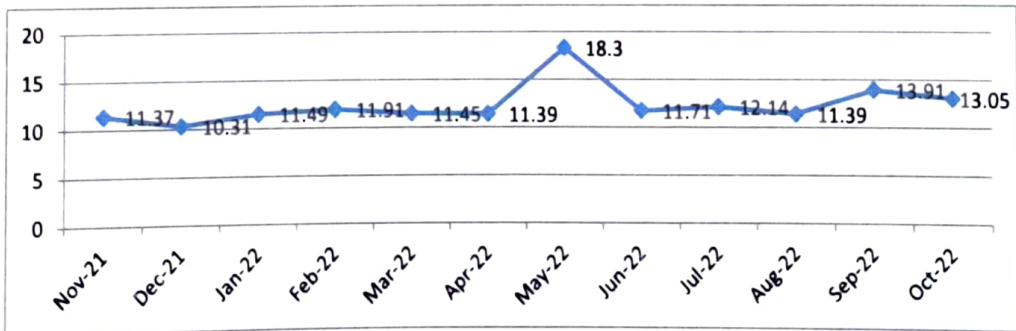


Figure 2.1 Graphical presentation of actual per unit charges year 2021-22



CHAPTER- 3 ENERGY CONSERVATION MEASURES

3.1 Case Study No. 1:-

Air Conditioning System:

1. It is recommended to replaced Sprit AC by BEE star rated AC
2. It is recommended “Fall Ceiling “in air conditioning area. It will be reduced air conditioning load of AC and unit consumption.
3. According to studies, for every one degree we raise the temperature of AC to, up to 6% electricity can be saved, So far, the default temperature for AC’s in India was 20 or 21 Degrees. Thus by increasing it to 24 degree you bare savings 18 to 20 % electricity- It is simple Maths.
4. Reduced the infiltration from door and window in air conditioning area.

3.2 Case Study No.2 :-

IOT based energy monitoring system:

1. Installation of “Cloud based (IoT based) energy monitoring system” at main feeder.
2. Installation of “Cloud based (IoT based) energy monitoring system” for solar system.
3. Installation of “Cloud based (IoT based) energy monitoring system” at DGsets for Fuel consumption and unit generation monitoring.



**Energy Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23**



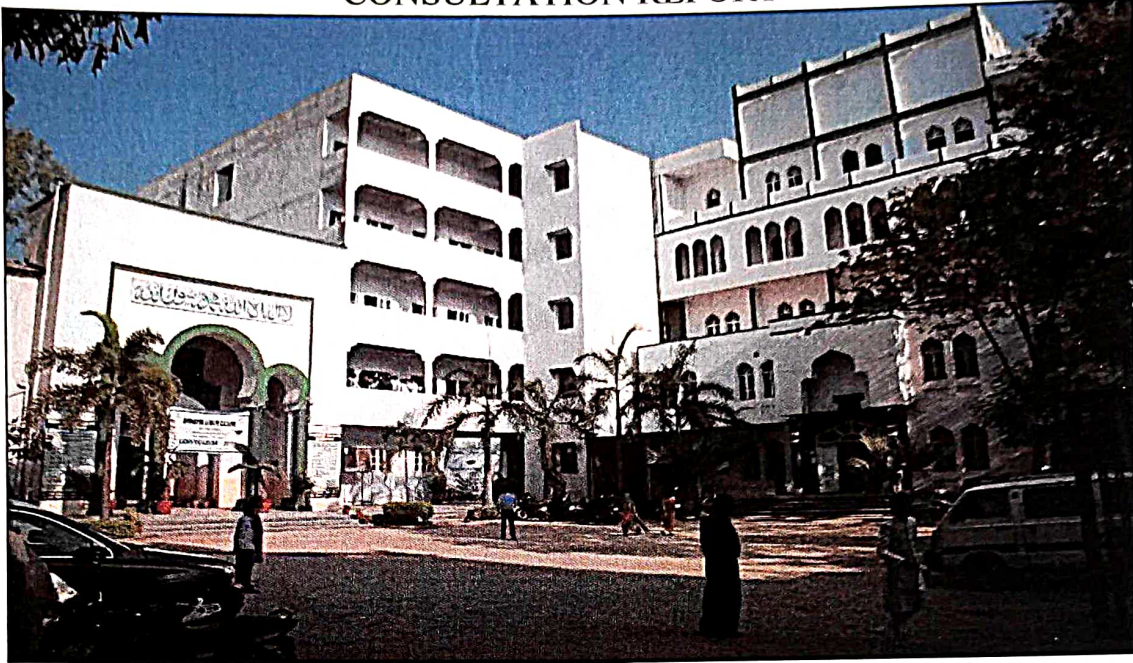
**END OF THE REPORT
THANKS**



**Environment Audit Report
Anwarul Uloom College, Hyderabad
Year 2022-23**



ENVIRONMENT AUDIT REPORT CONSULTATION REPORT



Anwarul Uloom College (Autonomous)

**11-3-918, New Mallepally, HYDERABAD,
TELANGANA-500001**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

**Flat No. 201, OM Apartment, 214 Indrapuri Colony,
Bhawarkuan, Indore – 452 001 (M. P.), India**

0731-4948831, 7869327256

Email ID: eempirical18@gmail.com

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(2022-23)



CONTENT

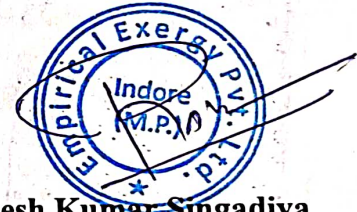
Sr. No.	Items
I	ACKNOWLEDGEMENT
II	ACCREDITATION CERTIFICATE
III	EXECUTIVE SUMMARY
Chapter-1	Introduction
1.1	About College
1.2	About College Campus
1.3	Environmental Monitoring Committee
1.4	Environmental Audit Team
1.5	About Environment Auditing
1.6	Objective of Environmental Audit
1.7	Target area of Environmental audit
1.8	Methodology Followed for conducting Environmental Audit
Chapter- 2	Water Consumption and waste water sources
2.1	Details of source fresh water and uses area
2.2	Water uses area in College Campus
2.3	Fresh Water uses for Gardening:
2.4	Waste Water Generation sources
2.4	Water Conservation
2.5	Water Consumption
Chapter- 3	Rain Water Harvesting System
3.1	About rain water harvesting
3.2	Estimated Rain water harvesting Potential of the College



ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of of Anwarul Uloom College (Autonomous), Hyderabad for giving us an opportunity to conduct environment audit for the College

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.



Rajesh Kumar Singadiya

(Director)

M.Tech (Energy Management), PhD (Research Scholar)
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
(BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal M.P.
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Secretary,
Bureau of Energy Efficiency
New Delhi



EXECUTIVE SUMMARY

The executive summary of the water audit report furnished in this section briefly gives the identified water conservation measures that can be implemented in a phased manner to water conservation and increase the productivity of the college.

AREAS FOR IMPROVEMENT AND RECOMMENDATION

FRESH WATER MONITORING SYSTEM:

- ✦ Installation of “Cloud based (IoT based) ground water extraction monitoring system” for well to quantify fresh water consumption per day in the College.
- ✦ Install water flow meters (Mechanical or Electronics) in distribution network, like college building, hostel building, and hospital building for quantity per day water consumption and waste water generation in the College campus.

WASTE WATER TREATMENT PLANT

- ✦ Waste water generated from various departments and canteen should be collect in separate waste water collection tank. It should be treated in proposed STP and ETP plants after that treated water reuse activity like gardening, toilet and wash room etc.
- ✦ Waste water generated from buildings washroom, canteen, shower water (bath) should be collected in a separate tank It should be treated in proposed STP and ETP plants after that treated water reuse activity like gardening, toilet and wash room etc.

DIP WATER IRRIGATION SYSTEM FOR GARDENING.

- ✦ Use dip water irrigation system for gardening.
- ✦ Treated waste water from above STP plant can be reuse for gardening purpose. It will reduce the fresh water consumption of college.

USE EFFICIENT WATER TAPS AND URINALS: -

- ✦ Water saving taps either reduce water flow or automatically switch off to help save water. So, it is highly recommended to install efficient water taps in college campus to reduce water consumption.



USE EFFICIENT URINAL TAPS: -

✚ Replacing these inefficient fixtures with water sense labelled flushing urinal can save between 0.5 to 04 litter per flush without sacrificing performance. Installing water saving flushing urinal will not only reduce water use in facilities but also save money on water bills.

INSTALLATION OF WATER OVERFLOW SENSOR IN TANKS: -

✚ It was observed that water overflow in overhead tanks after tank filling. So, it is recommended installation of water overflow sensor to avoid water overflow.

OTHER SUGGESTIONS.

Some of the very important suggestions are: -

- ✚ Establish institutional ecology policy and set an example of environmental responsibility and practices of resource conservation, recycling, waste management.
- ✚ Involve all stakeholders and encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in water conservation and sustainable development.
- ✚ Collaborate for interdisciplinary approaches to develop curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- ✚ Arrange training programmes on water management system and nature conservation.
- ✚ Conduct seminars, workshops and exhibitions on water and environmental education.



CHAPTER-1 INTRODUCTION

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The academic quality of college life is enhanced by the provision of the best faculty and all possible infrastructural facilities for the benefit of the student community of minority community and other communities.

Anwarul Uloom College, Hyderabad is a very popular college in the state of Telangana. It is one of the leading college in Arts, Humanities and Social Sciences, Business Finance and



Commerce, Management Studies and Science and Mathematics. It is located in Hyderabad, Telangana. Anwarul Uloom College, Hyderabad is a Private institution. More than 19 courses are taught in this institution.

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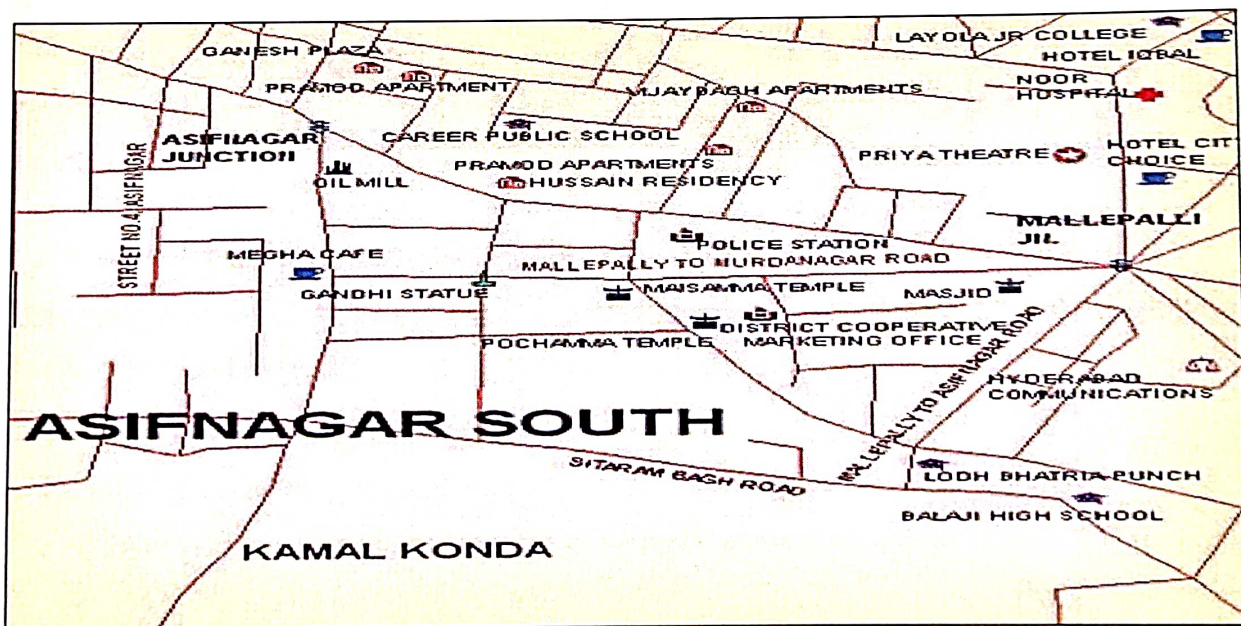


1.2 About College Campus:

The college is housed in a five different blocks with total built up area of around 35,000 Sq Ft.
The total area of the campus is 3,221 Sq Mtrs.



1.2 Layout of College Buildings: -





1.3 Environmental Monitoring Committee

Name	Position/Department
Principal	Mr. Mohammed Abdul Razzak
Director	Mr. Ahmed Baig
Director Administration	Mr. Mohd. Habeeb Uddin Ahmed
Biotechnology	Mrs. Nadeem Fatima
Botany	Dr. Sadia Fatima
Chemistry	Dr. Syeda Sameena Aziz
Computer Science	Dr. Ubaid Siddiqui
Computer Science &	
Engineering	Mr. Israr Ahmed
Economics	Dr. Neena Job
Electronics	Mr. Abaid Hussain
Political Science	Mrs. Asma Sadiah
Public Administration	Mrs. Viqarunnisa
Nutrition & Dietetics	Mrs. Nazia Mohammedi
Microbiology	Dr. Majid Mohiuddin

1.4 Environmental Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited**,

- ✚ Mr. Rakesh Pathak, [Director]
- ✚ Dr. Suresh Soni [Reviewer]
- ✚ Mrs. Laxmi Raikwar Singadiya,[Energy Engineer]
- ✚ Mr. Sachin Kumawat [Project Engineer]
- ✚ Mr. Ajay Nahra, [Site Engineer]



1.5 About Water Auditing

Environment audits can be a highly valuable tool for institute in a wide range of ways to improve their energy, environment and economic performance. while reducing wastages and operating costs. Water audits provide a basis for calculating the economic benefits of water conservation projects by establishing the current rates of water use and their associated cost.

1.6 Objectives of Environment audit

The general objective of water audit is to prepare a baseline report on water conservation measures to mitigate consumption, improve quality and sustainable practices.

The specific objectives are:

- ✚ To monitor the water consumption and water conservation practices.
- ✚ To assess the quantity of water, usage, quantity of waste water generation and their reduction within the college.

1.7 Target Areas of Environment audit

This indicator addresses water sources, water consumption, irrigation, storm water, appliances and fixtures aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.



1.8 Methodology followed for conducting Environment audit

Step 1: Walk through survey

- ✦ Understanding of existing water sourcing, storage and distribution facility.
- ✦ Assessing the water demand and water consumption areas/processes.
- ✦ Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection

- ✦ Analyse historic water use and wastewater generation
- ✦ Field measurements for estimating current water use
- ✦ Metered & unmetered supplies.
- ✦ Understanding of “base” flow and usage trend at site
- ✦ Past water bills
- ✦ Wastewater treatment scheme & costs etc.

Step 3: Site Environment Audit Planning (based on site operations and practices)

- ✦ Preparation of water flow diagram to quantify water use at various locations
- ✦ Wastewater flow measurement and sampling plan

Step 4: Conduction of Detailed Environment Audit & Measurements

- ✦ Conduction of field measurements to quantify water/wastewater streams
- ✦ Power measurement of pumps/motors
- ✦ Preparation of water balance diagram
- ✦ Establishing water consumption pattern
- ✦ Detection of potential leaks & water losses in the system
- ✦ Assessment of productive and unproductive usage of water
- ✦ Determine key opportunities for water consumption reduction, reuse & recycle.

Step 5: Preparation of Water Audit Report

- ✦ Documentation of collected & analysed water balancing and measurement details
- ✦ Projects and procedures to maximize water savings and minimize water losses.
- ✦ Opportunities for water conservation based on reduce/ recycle/ reuse and recharge options



CHAPTER- 2 WATER CONSUMPTION AND WASTE WATER SOURCES

2.1 Details of Source of Fresh Water and Use Areas:

The main source of freshwater is Borewell for the college. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project. Details of the pumps are given in table.

Table:2.1 Details of Fresh water sources

Sr. No	Source of Water	Depth (ft/m)	Type of Pumps	Rated (HP)
1	Bore well -01	170ft	Submersible	5 kW
2	Bore well-02	200ft	Submersible	3 kW

Figure: - 2.1 fresh water supply from Borewell for College campus

2.2 Water use areas in College Campus: -

Water is preliminary used for drinking, domestic, gardening and clinical activity. Audit team visited various departments and buildings to determine appliances.

2.3 Fresh Water uses for Gardening:

College has installed drip irrigation system in Stadium and Sport ground. Its Appreciable The one of major contribution from fresh water consumption is watering for other plants in college campus. There is good potential for water saving by adopt "Automatic Watering 360 adjustable misting nozzle irrigation Dripper's system" for plants. adjustable drip irrigation tools to provide different amounts of water depending on the water requirements of different plants. The drip speed can be set as for indoor and outdoor plants.



Adjustable Misting Nozzle Irrigation Drippers



Automatic Water Timer Unit

Fig: Technology for Drip Water Irrigation for plant

2.4 Waste Water Generation sources: -

Water Quality Assessment:

To cater the water requirement for the campus, two bore wells and one open well water are used for the activities. However in summer, to cater the additional shortage of water, a tanker from outside are hired to satisfy the needs of campus activities. The total quantity of water required for drinking is assessed for a population of 5000 students is assessed as 25000 liters per day. For hygienic drinking water, RO plants are installed in each block. In order to provide portable drinking water there are 10 RO's at various locations in the campus. Civil Engineering department tests the water every month. Once in six months the water is tested by Iota Laboratories, Hyderabad. The committee inspects the working of filters monthly and the quality of water is verify for suitability once in three months.



Recycling of waste water:

(The wastewater developed in college campus is treated in campus and is used for watering of garden. The institute does not have a Sewage Treatment Plant (STP). It is suggested to install a STP with the capacity of 2, 10,000 liters capacity per day.) Transferred to suggestion.

The quantity of wastewater generated in the campus should be assessed as per IS standards (IS 9868/1981) are given below

The Demand of Water for Anwarul Uloom College Campus

S. No.	Location	Student strength	IS demand	Water Quantity
1	Canteen	1000	180 lpcd	180000 lpcd
2	Institute	5000	45 lpcd	225000 lpcd
Total				405000 lpcd

The sewage treatment plant is not available may be considered by the college authorities for installation. Their services include viz.,

- a) They shall provide skilled operators for all three shifts to operate monitor and ensure consistent performance of the STP.
- b) They shall monitor activities of STP and report the same to his Plant Engineer regularly with all the necessary supporting documents like plant Log sheet, checklist etc.
- c) They shall provide all necessary chemicals.
- d) They shall carry out the cleaning of tanks, Sludge drying beds as and when required.
- e) They shall provide the lubricants and consumables required during operation and maintenance of the STP.
- f) They shall carry out preventive maintenance of the equipment as per schedule.
- g) All repairs like rewinding of motors, repair of gear boxes, pumps spares and blower, accessories, bearings, lobes will be carried out by you. However the spares required will be provided by NMIT.
- h) It will be their responsibility to maintain clean and tidy environment surrounding STP area.



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- i) It shall be their responsibility to test the treated water sample (only one sample in a month) in a KSPCB approved Lab and get the report for monthly report to KSPCB.
- j) It shall be their responsibility to prepare and submit the Consent Application for water, Air and Hazardous waste every year. (Consent fees and other KSPCB Expenses will be met by Client).
- k) Their personnel who stay in the campus shall take security clearance and shall abide by the college rules and discipline.
- l) It shall be their responsibility to take action on all remarks and observation as and when raised by the representative of KSPCB

Even though the firm tests the water sample every month, the department of Civil Engineering will analyze the water once in six months to oversee the activities of the contractperson.



2.5 WATER CONSERVATION

1.	List uses of water in your institute	Basic usage of water in campus are; Drinking, Gardening, Kitchen & Toilets, and Others. And total consumption is 411.75 KL/month
2.	How does your institute store water? Are there any water saving techniques followed in your institute?	Underground Water tank installed for storage of water. Avoid overflow of water controlled valves are provided in water supply system.
3.	If there is water wastage, specify why and How can the wastage be prevented /stopped?	No
4.	Locate the point of entry of water and point of exit of waste water in your institute.	Entry- Water comes from MCG water supply at campus Exit- From Water Drainage System to the back gate of campus
5.	Write down few ways that could reduce the amount of water used in your institute	By Following ways: 1. RWH, Close the taps after usage 2. Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage 3. Water Conservation awareness for new students



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6.	Record water use from the institute water meter for six months (record at the same time of each day). At the end of the period, compile a table to show how many litres of water have been used.	Calculation on the basis of Water Bill is shown below.
7.	Does your institute harvest rain water?	Six number of Modern rain water harvesting system are available.
8.	Is there any water recycling System.	Yes, RO waste water is stored in tank and is attached to toilet supply

2.6 WATER CONSUMPTION:

The college has water connection with Hyderabad Metro Water and Sewerage Board of GHMC with CAN No. 043221374 in the name of Principal, Anwarul Uloom College, Mallepally, Hyderabad with a monthly payment of Rs.2,233.00

S.No	Month	Water Consumption (KL)
1.	Nov-21	200 KL Rs. 2,233.00
2.	Dec-21	200 KL Rs. 2,233.00
3.	Jan-22	200 KL Rs. 2,233.00
4.	Feb-22	200 KL Rs. 2,233.00
5.	Mar-22	200 KL Rs. 2,233.00
6.	Apr-22	200 KL Rs. 2,233.00
7.	May-22	200 KL Rs. 2,233.00
8.	Jun-22	200 KL Rs. 2233.00
9.	Jul-22	200 KL Rs. 2,233.00
10.	Aug-22	200 KL Rs. 2,233.00
11.	Sep-22	200 KL Rs. 2233.00
12.	Oct-22	200 KL Rs. 2,233.00



CHAPTER- 3 RAIN WATER HARVESTING SYSTEM

3.1. Rain water harvesting systems

The rainwater harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later.

There are typically four components in a rainwater harvesting system:

- ✚ Roof Catchment.
- ✚ Collection.
- ✚ Transport.
- ✚ Infiltration or storage tank and use.

If rainwater is not harvested and channelized its runoffs quickly and flow out through storm-water drains. For storm-water management the recharge pits, percolation pits and porous trenches are constructed to allow storm water to infiltrate inside the soil.

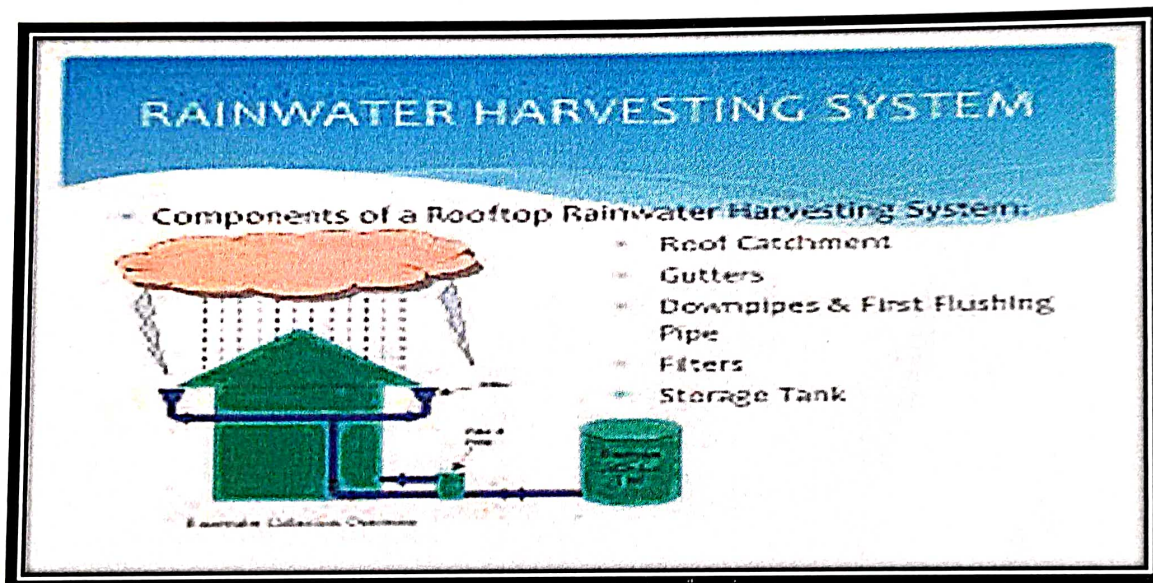


Figure: - 3.1 Components of a rooftop rainwater harvesting system



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End of the Report

Thanks