5/12/2022

REPORT ON GREEN AUDIT, ENERGY AUDIT & ENVIRONMENTAL AUDIT

VISAKHA GOVERNMENT DEGREE COLLEGE FOR WOMEN

Visakhapatnam -530020

Service Request No.: GDCL/GA/01/052022

GREEN DONE CONSULTANTS

Striving to make the globe greener

Prepared By:

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1. Executive Summary:

Eco campus is a concept 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.

Waste minimization plans for the educational institute are now mandatory to maintain the cleanliness of the campus. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as eco-campus the conducting Green Audit of institution is essential.

The green auditing of '**Visakha Govt. Degree College for Women, Visakhapatnam'**, enables to assess the practices, action and its impact on the environment. This audit was mainly focused on **Green Indicators** like consumption of energy in terms of electricity and fossil fuel, quality & utilization of water, vegetation, waste management practices and carbon foot print of the campus etc.

The premises were evaluated against the various criterions laid down by the National Assessment and Accreditation Council (NAAC). The major observations are.

Renewable Energy

- The college has installed a 20 kWp Roof-top Solar Photovoltaic System for self-use.
- The quantity of plant waste (organic waste with higher starch contents) is not very substantial, consequently, when the plants will grow enough, college may explore the potential for biogas generation.

Green Campus Initiative

- The movement of vehicle inside the campus is partially restricted as of now.
- There are pedestrian friendly pathways for in-campus movement.
- There is restriction on the usage of plastic, which may be extended to completely ban plastic usage inside the campus.
- The campus is surrounded with a lot of greenery, trees, and proper landscaping.
- The bicycles are allowed for in campus movement as required.

Environment & Energy Initiative

- Institute has planted more than 300 trees in its campus.
- Institute may go for replacement of existing fans with energy efficient BLDC fans.

Air Quality & Ventilation

- The classrooms and other area are well ventilated to ensure proper air quality.
- The fans are appropriately installed to ensure proper air circulation
- The indoor as well as outdoor plants have also been provided to improve the environment.

Lighting System

- The usage of natural light is optimized through well designed structure and windows.
- College has replaced almost all the lighting fixtures with LED.
- Institute has installed sensor based systems (motion sensors) to control operations of lights in library and virtual classroom etc. to save energy.

Water Quality & Conservation

- The water demand is met by water supplied by Municipal Corporation, bore well and water harvested from Rain.
- The water quality reports are not available. Water analysis is recommended.
- Portable aqua purifiers are installed for water purification.
- The rainwater harvesting system is available with recharging pits. The water is being used of gardening purpose.
- The distribution network and piping are more or less satisfactory and adequate.

Waste Management

- The effluent water is discharged in the common drainage system however there is no Sewage Treatment plant. Institute is planning to install STP in near future.
- The waste is segregated in two type solid and liquid waste.
- E-waste is collected separately and disposed of through AMC.
- The waste/ discharge from the laboratories, being in-significant in quantity, is being sent to drains without treatment.

Air Conditioning System

- The room temperature is maintained at 24 to 25 °C, which is well within the recommended values.
- The Air Conditioners are serviced regularly and properly maintained.
- All split air conditioner units are either 5-star or 3-star rated.

Infrastructure usage

- Lifts, Ramps & wheel chairs are provided for ease of movements for disabled persons.
- Separate washrooms are designated for disabled persons.
- Software is installed which helps the visually impaired or blind students to work on the computer.
- The on-campus movement is distributed with multiple entrances as well as staircases.
- There are adequate fire extinguishers are located at key areas. The college has initiated appropriate measures to meet the safety requirement.
- The draining system for washrooms is efficient and effective.
- No seepages were observed in the building premises.

Green IT culture

- The electronic communication is encouraged to minimize usage of papers
- Most of the papers are reused for doubled sided printing to further minimize usage of paper.

Auditors:

Mr. Atul Joshi

Accredited Energy Auditor (AEA-0037)

Bureau of Energy Efficiency (BEE, MoP)

Director – Green Done Consultant LLP.

Mr. Alkesh Rajdev

Accredited Professional

Indian Green Building Council

Director – Green Done Consultant LLP

2. Acknowledgment:

We wish to express our gratitude towards Management of **Visakha Govt. Degree College for Women, Visakhapatnam** for having given us the opportunity for conducting the study and the support provided during the study.

We are also thankful to the **Principal Dr. S. Shobha Rani** and **NAAC Coordinators Dr. K. Sudha (Lecturer in Hindi)** for extending the necessary help and co-operation from their side.

3. Audit Team:

From **Green Done Consultants LLP, Mumbai**

1. Mr. Atul Joshi – Accredited Energy Auditor & Director.
2. Mr. Alkesh Rajdev – Accredited Sustainability Consultant, IGBC AP & Director.

From **Visakha Govt. Degree College for Women, Visakhapatnam.**

1. Principal - **Dr. S. Shobha Rani**
2. NAAC Coordinator – **Dr. K. Sudha (Lecturer in Hindi)**

4. Introduction:

4.1. About Institute:

BRIEF HISTORY OF ESTABLISHMENT:

Visakha Government Degree College for Women is located in Visakhapatnam city in the state of Andhra Pradesh. Visakha Government Degree College for Women came into existence in the year 1975 with the name Visakha Women's College Society. It is a mere coincidence that the college was started in the International Women's year 1975.A college exclusively for women in this city became a reality in the year 1975 due to the constructive, relentless and conscious efforts of Sri. Singavarapu Surya Rao, a freedom fighter and a philanthropist. Understanding the need for an educational institution exclusively for women in one of the major cities of Andhra Pradesh, he left no stone unturned to fulfil the dreams of many girl students to get empowered through quality education. Smt. Rama Kumari Devi, the Rani Saheba of Jeypore, Orissa was kind enough to give her summer resort palace on the Beach Road, popularly known as "Hawa Mahal" for the college on a nominal rent. Eminent educationalists and the philanthropic public who rendered their services to the college include Smt. D. Saraswathi Devi, Justice Smt. Jagan Mohini, Sri. Kancharla Rama Chandra Rao and Sri Unnava Rama Rao etc. The college provided education at affordable cost from Intermediate level to under graduation in Arts and Commerce to the poor and middle class girls.

DETAILS OF AFFILIATION:

The Degree college was taken over by the Government of Andhra Pradesh vide G.O.Rt.No.2136Edn Dt.22-11-1992. The college was admitted into UGC assistance under 2F and 12B in 1999 vide Letter no.F.8-33/97 (CPP-I) dt.22-05-1999.

PROGRESS OF THE INSTITUTE SINCE ESTABLISHMENT

In 1975 the year of establishment, the college consisted of both Intermediate and Degree students and offered only commerce and Arts courses in English and Telugu media. In the year 1983, the composite college bifurcated into Visakha Degree College for Women and Visakha Junior College for Girls. Science courses were introduced in 1988-99. The applied sciences courses like B.Sc. Microbiology and B.Sc. Biotechnology (vocational) were introduced in the year 1998-99 keeping in view of the needs of changing employment market. The science laboratory complex with 9 laboratories was constructed during 2001-03 with the funds from the government Budget, MPALDS, UGC grant and donations from Visakha Port trust.

To further the cause of women's education, the institution started PG courses such as M.Sc. Microbiology and M.A. Social Work in the year 2002-03. PG courses in M.A. English and M.A. Psychology were introduced from 2012-13. 3 UG courses i.e., B.A. H.E.P., B.Sc. M.P.C. and B.Sc. BZC and 4 P.G. courses M.A. Economics, M.A. Telugu, M.Com. Commerce and M.Sc. Mathematics are the latest additions to the institution's curriculum.

Today the college is located in the heart of the city amidst heavy business establishment but the serenity inside the campus is incomparable. Efforts have been made for the replacement of the sheds with RCC structures as per the Master plan and a major part of it has been translated into reality by generating funds from MPLADS, Municipal corporation, the District Administration, the Government of Andhra Pradesh, the UGC and also philanthropic public.

The college has always been forefront in adapting new technologies for a more effective teaching learning experience. The college has been regularly taking measures to upgrade infrastructural facilities to meet the requirements of its increasing strength.

The campus today consists of an administrative block, separate laboratory block and classroom complex with 5 Digital & 3 Virtual classrooms, playground, open air stage, parking area, botanical gardens etc.

4.2. Vision Statement of the College

Empower Women to attain Excellence through quality and value based education.

4.3. Core Values

1. Pursuit of Excellence
2. Quality Consciousness
3. Inclusiveness
4. Social Responsibility & Service
5. Environmental Stewardship
6. Global Competencies

4.4. Mission Statement of the College

To accomplish the vision, Visakha Govt. Degree College for Women has been

Inculcate Humanity, Spirit of service, Social responsibility through Add-on courses and Certificate courses.

Develop skill oriented and technical competencies for the capacity building of students.

Create awareness about the latest innovations in the field of technology by introducing new market oriented courses.

Promote academic exchange and academia-industry interface.

Constantly strive towards modernization through automation and excellence in infrastructure facilities.

Contribute New Perspectives to the World of Knowledge by providing access to Digital Information and e-resources.

Promote the holistic development of the students through promotion of participation in curricular, co-curricular activities and extra- curricular activities.

Generate Women Entrepreneurs charged with new ideas and capacity to contribute towards Nation development.

Google Earth Image

Fig. 1 Location of the College

The student and faculty strength of the college is listed below:

Physical Structure:

Physical Structure	
Total Campus Area	4 Acres
Built-up Area	1 Acre
No. of Departments	21
Conference Halls	2
Class Rooms	34
Office Rooms	1
Labs	17
Auditorium	1
Canteen	1
Library	1
Other	Botanical Garden
Other	Medicinal Garden
Other	Terrace Garden
Other	Vegetable Garden

Total Strength of Students, Teachers & Non-teaching Staff:

Staff Details	Male	Female	Total
No. of Students	0	1483	1483
No. of Teaching Staff	2	28	30
No. of Non-Teaching Staff	6	6	12

1. Objectives of Green Audit:

The main aim objectives of this green audit is to assess the environmental quality and the management practice and strategies being implemented in Visakha Govt. Degree College for Women, Visakhapatnam.

The specific objectives are:

1. To monitor the energy consumption pattern of the college.
2. To assess the quality of the water in the campus.
3. To quantify the liquid and solid waste generation and management plans in the campus.
4. To assess the carbon foot print of the college.
5. To assess whether the measures implemented by the College have helped to reduce the Carbon Footprint.
6. To impart environment management plans of the college.
7. Providing a database for corrective actions and future plans.
8. To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of waste generated within the campus.
9. To identify the gap areas and suggest recommendations to improve the Green Campus status of the Visakha Govt. Degree College for Women, Visakhapatnam.

2. Target Areas of Green Audit:

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 efficiency in resource utilization. All these indicators are assessed in the process of "Green Auditing of this educational institute".

Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. **Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.**

2.1. Auditing for Water Management

Water is a natural resource; All living organisms depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. Groundwater depletion and water contamination are taking place at an alarming rate. Hence it is essential to examine the quality and usage of water in the college. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

2.2. Auditing for Energy Management

Energy conservation is an important aspect of campus sustainability which is also linked with carbon foot print of the campus. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

2.3. Auditing for Waste Management:

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.

Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste.

1. Bio-degradable wastes includes food wastes, canteen waste, wastes from toilets etc.
2. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc.
3. 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.

2.4. Auditing for Green Campus Management:

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees in campus are also working hard to make the air cleaner for you.

2.5. Auditing for Carbon Footprint:

Burning of fossil fuels (such as petrol) has an impact on the environment through the emission of greenhouse gases into the atmosphere. The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. Vehicular emission is the main source of carbon emission in the campus, hence to assess the method of transportation that is practiced in the college is important.

3. METHODOLOGY ADOPTED:

The methodology adopted to conduct the Green Audit of the Institution had the following components.

Onsite Data Collection:

Due to Covid restrictions, virtual tour of the college campus was organized by the Green Audit Team. The data samples and relevant photographs were collected through geo-tagged photographs. The key focus of the audit was on assessing the status of the green cover of the Institution, their waste management practices and energy conservation strategies etc.

Focus Group Discussion:

The Focus Group discussions were held with the staff members and the management focusing various aspects of Green Audit. The discussion was focused on identifying the attitudes and awareness towards environmental issues at the institutional and local level.

Energy, Waste Management and Carbon Foot Print Analysis Survey:

With the help of teachers and staff, the audit team has assessed the energy consumption pattern and waste generation, disposal and treatment facilities of the college. The monitoring was conducted with a detailed questionnaire survey method.

4. AUDIT STAGE:

Green auditing in **Visakha Govt. Degree College for Women, Visakhapatnam** began with the assessment of the status of the green cover of the Institution followed by waste management practices and energy conservation strategies etc. The team monitored different facilities at the college, determined different types of appliances and utilities (lights, taps, toilets, air conditioners, etc.) as well as measuring the usage per item (Watts indicated on the appliance, etc.) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified several times to clarify the data received through survey and discussions.

5. GREEN AUDIT REPORT

5.1. Water Quality Assessment:

Water demand is met by three sources viz. Bore Wells (2 Nos), Municipal Water Supply and Harvested Rain Water. Institutes has installed portable aqua purifiers at various locations to treat the water before using it for drinking purpose. The bore well water & rain water is being used for flushing and gardening.

(Library)

(Sports Department)

(Science Lab)

Institute has never carried out water analysis of the bore well water. Hence current water analysis was not available at the time of audit. **However, water pH is being frequently tested by the chemistry department to test the quality of water.**

Institute has installed water coolers to provide cold water to the staff.

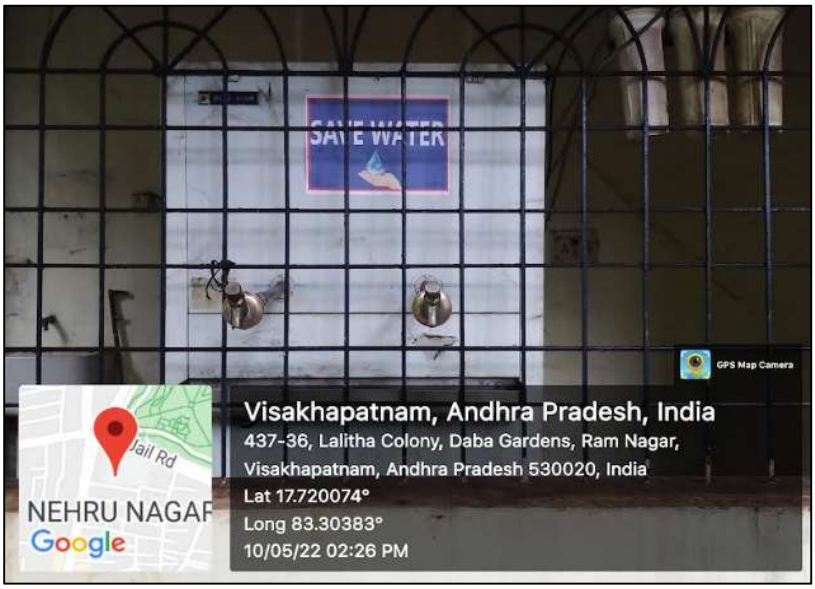
5.2. Water Management:

The source for the water used in the College is two numbers of bore wells present in the campus.

Institute has installed 11 number of overhead tanks with a total capacity of 11000 Lit.

Water availability is good throughout the year & institute do not need tanker water to meet its demand.

- College has displayed signboards for spreading awareness of its water saving initiatives.



- There was no leaking taps or water wastage reported during the audit phase.
- Institute is following a practice where washrooms are visited by the members of *Swachch Bharat Committee* to find out the leaks and repair works such as change of leaking taps and pipes are taken up immediately to minimize the water loss.
- Sprinklers are also arranged to minimize the wastage of water.
- The institute has installed **Rain Water Harvesting** system for recharging the bore well with rainwater from the roof.

- Newly constructed toilet blocks are designed in such a way that the rain water from the roofs is directly collected into tanks; this water is later used for flushing.
- These toilets have low flow as well as low-flux faucets and appliances with small economic flush tanks were fitted.

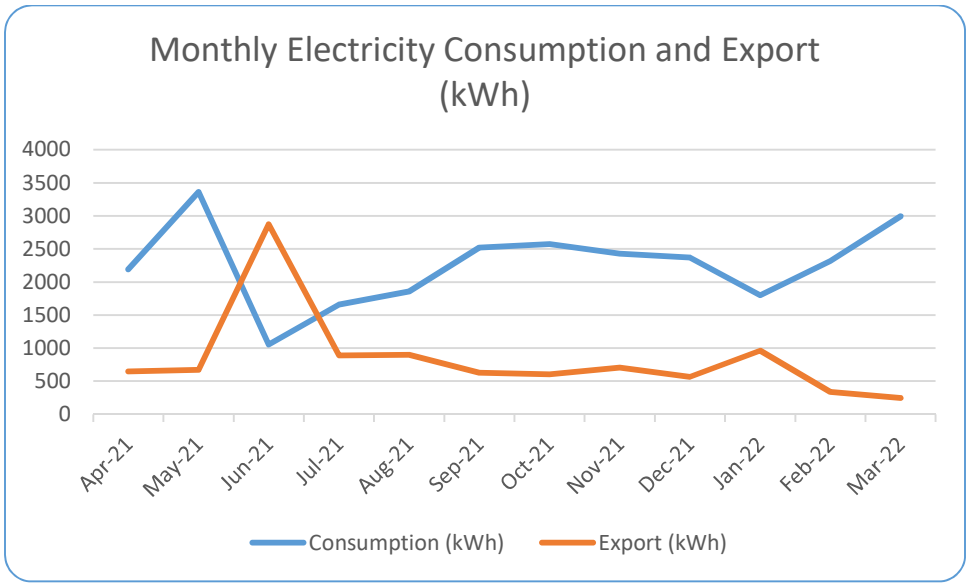
- Detection and immediate repairs being done for the distribution system to minimize the water losses.
- *Swachch Bharat Committee* is organizing various awareness programs to encourage the students to minimize the water for personal consumption.
- There is no **Sewage Water Treatment** plant in the campus to recycle the waste water for the use of flushing and gardening. The waste water is being drained to main drainage system of the city.
- There is very minimal effluent generation from the laboratory which is being discharged in to the common.

5.3. Energy Audit Report:

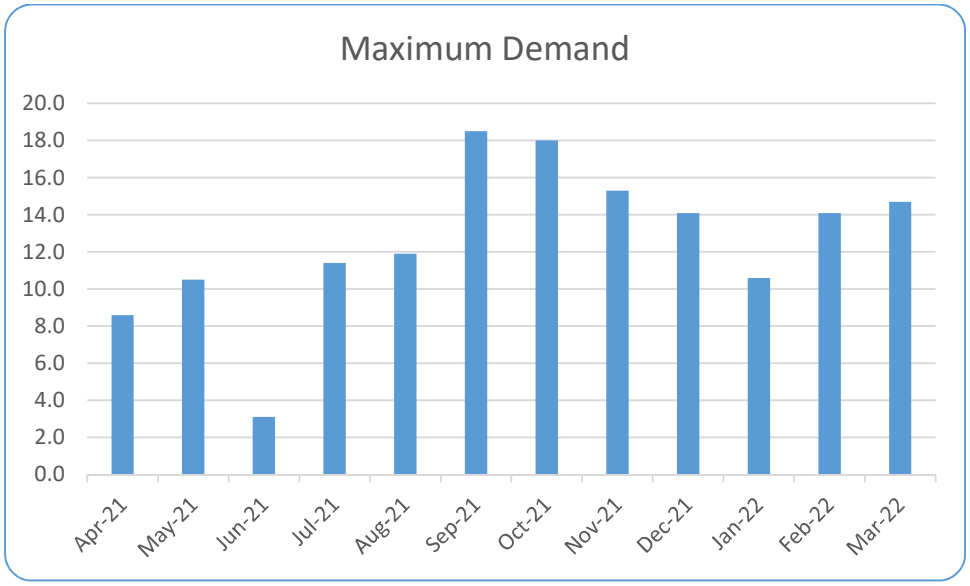
5.3.1. Electrical Bill Analysis:

Electricity is supplied by The Eastern Power Distribution Company of Andhra Pradesh Limited. The institute falls under 'IV-LT Institutional - General Purpose' tariff category. The electricity charges under this tariff is Rs. 7.00/kWh for LT Supply Institutional feeder consumers. A Fixed Charges per month of Rs. 75/ kW is charged as per tariff. There is Monthly Minimum Energy charges of Rs. 150/- for Three Phase Supply. Customer Charges of Rs. 45 per month for the selected tariff category.

Institute has installed a Solar PV rooftop system with Net-Metering. Following chart shows the energy consumption Vs energy export pattern of the college over last 12 months. The college has consumed an average of 2261 kWh/month and has exported around 835 kWh/month electricity in last 12 months.



The contract demand/ connected/ sanction load is 54 kW. The maximum demand has never crossed 20 KVA in last 12 months. As per tariff structure, each KW is charged at Rs. 75. If the consumption pattern is same all over the year and if there is no capacity addition planned in future, Institute may check the feasibility of surrendering 20-25 KW contract demand. It will help in reducing the electricity bill by Rs. 1500-1900 per month i.e. Rs. 18000 – 22500 per annum.



5.3.2. Electrical Consumers:

Institute has installed air conditioners in various Labs, rooms and offices. The installed air conditioners are having 5-star and 3-star rating. The air conditioner is well maintained and serviced regularly. The temperature setting is generally kept at 24-25 °C for energy saving purpose.

The refrigerator is also a star rated (2-star) equipment which shows institutes commitment towards energy saving.

The list of common electrical consumers along with its typical electricity consumption is provided in the table below.

Type of Electrical Device	Quantity	Power	Operation	
	Nos.	Watt	Hrs/Day	Days/Month
LED Tube lights	279	28	4	24
Fans	206	80	6	24
Printers	7	40	0.5	24
Refrigerator	4	150	6	24
Computers	286	70	6	24
CFLs	20	9	6	24
LEDs	30	18	6	24
Microwave Oven	1	500	2	20

Air Conditioners						
Room No. / Name	**Type**	**Capacity**	**Quantity**	**Power**	**Operation**	
		TR	**Nos.**	**Watt**	**Hrs/Day**	**Days/Month**
Seminar Hall	Split AC	2	6	2000	6	3
Principals Chamber	Split AC	2	1	2000	6	24
JKC	Split AC	2	4	2000	2	12
IQAC	Split AC	2	1	2000	1	24
Microbiology	Split AC	2	1	2000	3	12

5.4. Alternate Sources of Energy and Energy Conservation Measures

- Institute has installed 20 kWp Solar PV Rooftop system with Net-metering facility. Total 64 nos. of panels are installed on the rooftop.

- Since the biodegradable waste generation is very low, there is no Bio-gas plant.
- Institute has installed motion sensors at two locations (library & virtual class room) to control the switching ON/OFF of the lights to save energy.

- Institute is has replaced all existing lighting fixtures with LEDs and energy efficient lighting fixtures.

- Institute is utilizing the natural light to its maximum. The classroom and offices are designed in such a way that it allows maximum sun light and reduces requirement of artificial lights.

5.5. Waste Management:

Following data provide the details of the waste generated & the disposal method adopted by the college.

Physical Structure	
Total Campus Area	4 Acres
Built-up Area	1 Acre
No. of Departments	21
Conference Halls	2
Class Rooms	34
Office Rooms	1

Labs	17
Auditorium	1
Canteen	1
Library	1
Other	Botanical Garden
Other	Medicinal Garden
Other	Terrace Garden
Other	Vegetable Garden

Total number of rooms (Class rooms, canteen, office, auditorium, library etc.): **57**

Total number of stakeholders in the college: **1525**

Staff Details	Male	Female	Total
No. of Students	0	1483	1483
No. of Teaching Staff	2	28	30
No. of Non-Teaching Staff	6	6	12

5.5.1. Waste Management Practices Adopted by the College:

Following table shows the quantum of waste generation from office, labs & canteen.

Approximate quantity of waste generated per day (in kg)				
Office	**Type of Waste**			
Quantity	**Biodegradable**	**Non-Biodegradable**	**Hazardous**	**Others**
< 1kg		Yes		
2 - 10 kg	Yes			
> 10 kg				
Labs	**Type of Waste**			
Quantity	**Biodegradable**	**Non-Biodegradable**	**Hazardous**	**Others**
< 1kg		Yes		
2 - 10 kg				
> 10 kg				
Canteen	**Type of Waste**			
Quantity	**Biodegradable**	**Non-Biodegradable**	**Hazardous**	**Others**
< 1kg	Yes			
2 - 10 kg				
> 10 kg				

- There is no biomedical waste generation happening in the college.
- There is no hazardous chemicals and radioactive waste getting generated in the college.
- The institute is segregating the waste in to 3 categories viz. e-waste and solid & liquid waste.
- Institute is treating the biodegradable waste in vermicomposting pit.

- The paper waste is being properly recycled. During current year institute has recycled more than 1000 kg of paper waste. Equivalent to environmental savings of 18 trees, 2 KL of water 431 units of energy and 0.09 tons of CO2. A certificate of appreciation is attached below.

- **E-waste Management:** A college level committee is constituted which identifies the electronic equipment which is not in working condition. The college annual maintenance contractor (AMC) inspects & certifies that the equipment is unserviceable and may be disposed of.
- Disposal is sent to APTS (Andhra Pradesh Technology Services Ltd) which is empanelled for safe disposal of e-waste.

5.6. Green Campus:

Institute has planted more than 300 no. of trees and is maintaining a lawns in the campus.

- Total number of plant species/types identified - 7.
- Total number of plants in the campus – 316.

Table 6. List of plants in the campus

Sl. No	Type of plants	Number of species available
1	Ornamental plants	123
2	Fruit yielding	26
3	Medicinal	92
4	Vegetable plants	21
5	Timber yielding plants	7
6	Indoor plants	35
7	Xerophytes	12
	Total	**316**

5.6.1. Green Campus Initiatives:

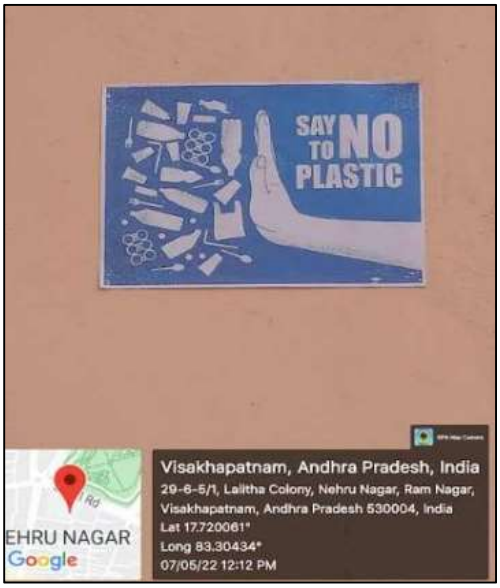
Following are few activities under green campus initiatives.

- Automobile entry is partially restricted in the campus. Vehicles of only staff and VIPs are allowed inside campus.

- Institute is yet to adopt the battery-powered vehicle for transportation. However cycles are being used for internal transport.

- The pathways inside the campus are pedestrian friendly. The natural landscape has been preserved while accommodating the demand to use these venues. There is a clear pedestrian connection through all campus roads and adequate parking facilities.

- Institute has initiated banning plastic in the campus. Institute has already taken steps and some are in the process of finding ways to totally ban plastic from the campus, and also advising students to say no to plastic outside college as well.



- Various awareness programmers, campaigns are conducted in the college to spread the word about banning the plastic.

ప్లాస్టిక్ సంపూర్ణ నిషేధం అత్యవసరం

ప్లాస్టిక్ నిషేధాన్ని కోరుతూ సంతకాల సేకరణ చేపడుతున్న శోభారాణి తదితరులు

ప్రభుత్వ మహిళా కళాశాలలో ప్లాస్టిక్ నిషేధంపై సంతకాల సేకరణ

Signature Program on Plastic Ban *Awareness Program on Plastic Ban*

పర్యావరణాన్ని కాపాడుకుందాం

అవగాహన ర్యాలీలో పాల్గొన్న మేయర్ హరివెంకటకుమారి, కార్పొరేటర్ నాగరాజు తదితరులు

Rally on Plastic ban

- The college campus is landscaped with various trees & plants. Tree plantation programs, helps in encouraging eco-friendly environment, which provides pure oxygen within the institute.
- College management looks after green environment with proper landscaping and well maintained green campus with lots of trees. Every year tree plantation activity is conducted.

- The Visakha Government Degree College for women is located in the commercial area the city. Though it is situated in a heavy traffic area, the college offers a pollution free environment to the people who step into the campus.
- As a measure to sequester carbon in the campus, wide plantations are taken up and classrooms are provided with indoor plants.
- Planting longer – rooted trees and incorporating organic materials into the soil to encourage the trapped carbon to move into and stay in soil.
- Our college conducts plantation drives regularly. The Department of Botany, Green Club and NSS Units take plantation drives in the campus. NSS Units also organize plantation programs in the adopted villages.
- In the first week of July, the college organizes 'Vanamahotsav' a week-long program. In this program large scale plantations and distribution of saplings to the neighborhood community are taken up.

5.6.2. Quality Audits on Environment and Energy:

Institutes has initiated carrying out following audit on regular basis.

1. Green Audit
2. Environmental Audit
3. Energy Audit

This is the first audit and institute plans to have such audits at regular frequency.

Institute is carrying out many environmental promotion activities in the campus throughout the year. These activities include

- ✓ Cleanliness Drive
- ✓ Plantation Drive

The institute not only organizes such program inside the campus but is also actively doing it outside the campus as well.

In college various committees are functioning for this purpose are Green Club and Swachch Bharat committees and NSS units. The institution is having a good number of housekeeping staff and is taking proper care for interior "cleaning" and maintenance by using environmentally friendly cleaning products and incorporating safer methods to clean buildings provides for better property asset management and a healthier workplace.

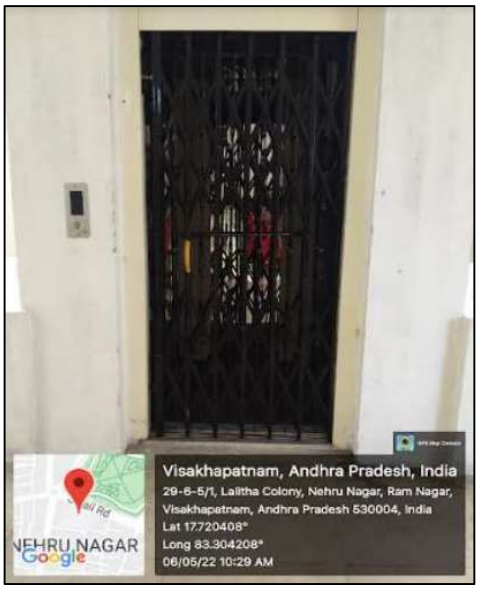
Outside Campus Activities:

5.6.3. Routine Green Practices:

Every year college celebrates World Environment Day, World Water Day, etc. in the campus. Plantation and cleanliness drives are also organized in the campus. Main focus of these programs is to provide awareness to the students about the importance of the environment, its conservation and sustainable use of environmental resources. The programs are conducted through seminars, poster presentation, quiz competition debates etc.

5.6.4. Disabled-Friendly Environment:

Institute has provided a lift, a ramp and wheel chair for easy access to classrooms for disabled students and staff. Wheelchairs are available for disabled students/ staff for movement in the camps. College also provided a separate washroom for disabled students.

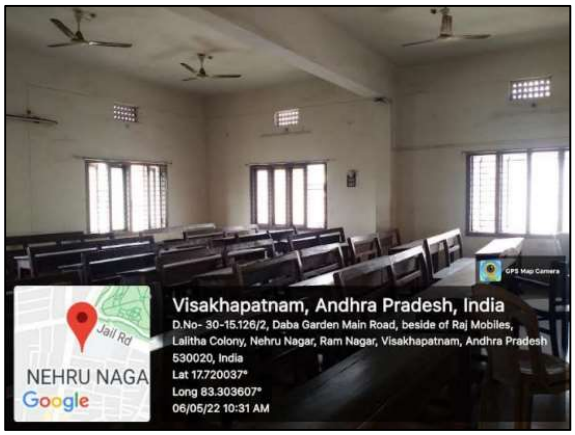


Screen reader software:

JAWS software is installed which helps the visually impaired or blind students to work on the computer. This software enables the blind or visually impaired students to read the text displayed on the computer screen with a speech synthesizer or Braille display and makes the learning so handy and convenient to the students.

5.6.5. Air Quality & Ventilation:

The classrooms and offices in the premises are well ventilated. The fans are operational and adequately placed to effect the sufficient air changes. Fans installed are not star-rated. College has done indoor plantation to provide fresh air inside the premises.



5.6.6. Infrastructure Usage:

- College premises has multiple entrances and has broad passage ways.
- The campus has proper drainage system and there were no leakages/ seepages from the roof was observed.
- The institution is having a good number of housekeeping staff and is taking proper care for interior "cleaning" and maintenance.
- General Maintenance activities such as ground maintenance and proper cleaning of exterior surfaces as well as Landscaping, etc. are taken up by the green club and Swachch bharat committees of the institution.
- The premises has fire extinguishers installed at required locations which are regularly checked and maintained.

5.6.7. Green IT Culture:

The institute is following a green IT culture.

- Email/ electronic communication mode is preferred to save papers.
- Both side printing is being adopted to save paper and trees.

6. Carbon Foot Print Analysis:

6.1. CO2e Calculation:

Carbon Foot Print Calculation		
A- Scope 1 (Direct Emission)		
Source	Fuel Consumption	CO2
DG	NA	NA
Vehicles	NA	NA
Others	NA	NA
B- Scope 2 (Indirect Emission)		
Source	Unit Consumption	CO2 (KG)
Electricity Consumption (Annual)	27133	34187
Total A+B	**27133**	**34187**
Carbon Offset		
Source	Quantity	CO2 (KG)
Solar	Nil	0
Trees	316	6320
Others	Nil	0
Total	**Nil**	**6180**

Sr. No	Description	Remark
1	Direct Emissions	No Data available
2	Indirect Emissions	Calculated as per international standards
3	Reductions	To increase the carbon offset, it is recommended to inspect the installed Solar PV. Generation may be enhanced.

To offset the additional carbon, Institute may

1. Plant more no. of trees
2. The average export electricity (generation from solar PV) is almost half of its expected generation capacity. Institute may inspect and take necessary actions to reinstate its generation.

7. SUGGESTIONS AND RECOMMENDATIONS:

7.1. Water Management:

- There should be a proper monitoring of water consumption pattern in the campus. The water meter readings to be recorded every day or every week at a fixed time.
- It is recommended to check water quality from bore well for dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, and conductivity, total dissolved solids and E-coli/ coliform.
- Remaining wash basin taps may be equipped with water saving fixtures.
- The flush tanks of the toilets may be fitted with dual volume system.
- Institute may install drip irrigation system to water the garden and plants in the campus.

7.2. Energy Management:

1. Ceiling fans have a very good scope for reducing power consumed using a technology called Brushless DC Motor or simply BLDC motor. BLDC technology, in general, has been in the market for a couple of decades. The traditional fan uses an induction motor and typically consumes 70-90 watts. But BLDC fan, on the other hand, can reduce power consumption up to 65%.
2. Prominent advantages of BLDC motor over induction motor are Lower Electricity Consumption, Longer backup on Inverters (even on Solar), improved reliability, Noise reduction, longer lifetime.
3. Institute may considered replacing existing fan with BLDC fans which

Sr. No.	Parameters	Unit	Value
1	Total No. of Fans	Nos.	206
2	Power Drawn by Regular Fans	Watts	80
3	Power Drawn by BLDC Fans	Watts	35
4	Energy Saving per Fan	Watts	45
5	Operating Hours Per Day	Hrs/Day	6
6	Annual Operating Days	Days/Yr	312
7	Annual Energy Savings Per Fan	kWh	84.24
8	Annual Energy Savings – For 306 Fans	kWh	17353.44
9	Energy Cost	Rs./kWh	7.00
10	Annual Cost Savings	Lacs Rs.	1.21
11	Estimated Investment	Lacs Rs.	6.18
12	Simple Payback	Years	5.1

4. To offset carbon emissions, Institute may get the installed Solar rooftop inspected to ensure proper generation as per capacity of the system

7.3. Green Campus:

1. Institute may go for total restriction on the entry of automobiles inside its campus.
2. Battery powered vehicles may be adopted in future to reduce emissions inside campus.

7.4. Waste Management:

1. College may undertake feasibility study to install sewage water treatment in the campus to recycle waste water and use it in flush or for gardening purpose.
2. Try to completely ban the use of plastic in the campus, and to encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic free campus.