ENVIRONMENTAL AUDIT REPORT

of

Government Degree College for Women

Begumpet, Hyderabad

(Autonomous ,affiliated to Osmania Univeraity)

PREPARED BY

Green audit Committee

GDCW Begumpet

Table of Contents

1.1 Introduction to environmental audit

Environmental audit or green audit is a general term that reflects various kinds of evaluations intended to identify environmental compliance and management system, implementation gaps, along with related corrective actions. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the ecofriendly ambience. Green audit is a useful tool to determine how and where energy or water resources are being used; and then recommendations be given on how to implement changes and make savings. It is also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. It also creates health consciousness and promotes environmental awareness, values and ethics. It imparts a better understanding of Green impact on campus to staff and students.

The ICC defines Environmental Auditing as:-
"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safe guarding the environment and natural resources in its operations/projects."

1.2 Need for environmental audit

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises.With this background, it becomes imperative to adopt the system of the "Green Campus" for the Institutes which will lead to sustainable development and at the same time reduces a sizable amount of atmospheric carbon dioxide from the environment.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

1.3 Objectives of environmental audit

In its pursuit for improving environmental quality and to maintain a pristine environment for the future generations of students, Government Degree College for Women, Begumpet, ((A() Hyderabad has conducted an audit on environmental quality of the campus with the following objectives to :

i. Establishing a baseline of existing environmental conditions with focus on natural and physical environment;

ii. Understanding the current practices of sustainability with regard to the use of water and energy, generation of wastes, purchase of goods, transportation, etc;
iii. Awareness generation among students concerning issues of environment and its sustainability
iv. Promotion of environmental awareness through participatory auditing process; and
v. To create a report that document baseline data of good practices and provide strategies and action plans towards improving environmental quality for future.

OBJECTIVES OF ENVIRONMENTAL AUDIT /GREEN AUDIT

The main aim objectives of this green audit are to assess the environmental quality and the management strategies being implemented in Government Degree College for Women , Begumpet, (A) Hyderabad.

The specific objectives are:

1. To assess the quality of the water and soil in the Government Degree College for Women, Begumpet,(A) Hyderabad campus
2. To monitor the energy consumption pattern of the college
3. To quantify the liquid and solid waste generation
4. To assess the carbon foot print of the college
5. To prepare environment management plans for the college
6. Providing a database for corrective actions and future plans.
7. To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of solid wastes.
8. To identify the gap areas and suggest recommendations to improve the Green Campus status of the Government Degree College for Women, Begumpet,A) Hyderabad campus

1.4 About the College

Government Degree College for Women, Begumpet, Hyderabad was established in 1971. It is located centrally at Begumpet and caters to the needs of the girl students of twin cities and also the nearby districts. The college provides university education to deserving candidates in a secular atmosphere and is committed to serve the economically weak, socially underprivileged and needy students. During the last four decades the college has grown from strength to strength and presently helps about 3676 students to access higher education. With an objective of “Empowerment of Women through Knowledge”, the college helps the students to become truly empowered citizens. The college celebrates its Golden Jubilee (50 years) this year ie 2021.

Keeping in tune with the changing needs of the society, new courses have introduced from time to time. Since, 2014 when the CBCS system was introduced, the college has grown and today has 56 undergraduate courses and PG Courses like M.Sc. Chemistry, M.A English , M.A Economics , M.Com and M.Sc Mathematics.

Recognizing the potential of the college the UGC has conferred autonomous status to the college in the year 2012.

The college has two buildings with spacious class rooms and laboratories, a good Library with a Reference section and a Reading Room. Telangana Skills & Knowledge Centre (TSKC), the Computer Centre, the Health centre, the Gymnasium, the MANA TV(T-SAT Nipuna) and the Audio-Visual (MOOCs)Department are the other supporting services provided by the college. During the academic year 2016-2017, the college was assessed and re-accredited by NAAC with B+ grade (3rd Cycle)).

There are about 80 experienced teaching Staff, a Librarian, and a Physical Director . Most of our lecturers received Best teacher Awards from the Government of Telangana and other organizations. The Administrative Officer and the twenty members of Non-Teaching Staff help in the maintenance and smooth functioning of the college. The overall academic, administrative and financial responsibility of the college is vested with the principal.

Methodology

This compilation is based on the Survey by Questionnaire. The survey was done in the whole campus. On the basis of data requirement, set of questionnaires about electricity consumption, water consumption, waste generation, solid waste collection and transport were prepared.

2.1 Survey by questionnaire

The different questionnaire formats were restructured also with different combinations and modifications. The final sets of questionnaires were prepared based on solid waste, energy, fuel, water, hazardous wastes and e wastes.

2.2 Data evaluation

The information gathered during the surveys was compiled for the further analysis.

3.1 Data Analysis

3.2 Land use

The college campus covers an Area of 2.37 Acres with a Built-up Area: 69534 Sq. ft. All the building has ventilators for natural air flow in all rooms.

The student and faculty strength of the college:

Strength	Male	Female	Total
No of students	--	3676	3676
No of Teaching Staff	09	44	53
No of Non-Teaching staff	22	14	36

Physical Structure

- The available land of the college: 2.37 acres.
- The built-up area of the college: 69534 Sq. ft.

No. of Class Rooms	55
No. of Laboratories	13
No. of Conference halls	02
Library Halls	02
Auditorium	Open - 1
Canteen	01
Any other (please specify)	

3.3 Water audit

Water Management

Water audit is conducted periodically to determine water supplied in the distribution system as well as water lost and/or used within a distribution system. It aims to establish the water consumption pattern in individual sections, so as to realise the consumption levels with respect to exploring various pollution prevention and wastewater minimisation opportunities. Water audit also helps to establish the existing water distribution system as well as waste water collection and recycling, if any. The source of water in the college by municipal supply HMWSSB (Hyderabad Metropolitan Water Supply and Sewerage Board) as well as by the ground water. The storage capacity of water in the college is 10 Overhead Tanks x 2000 litres Capacity is 20000 litres.

The study evaluates the facilities of raw water intake and facilities for water treatment. The process investigates the relevant method that can be adopted and implemented to balance the demand and supply of water in the college.

AUDITING FOR WATER MANAGEMENT		
1	List out uses of water in your college	Basic usage of water in campus are; Drinking, Gardening, Kitchen & Toilets, and Others. And total consumption is XX KL/month
2	What are the sources of water in your college?	HMWSSB and Bore wells
3	How many wells are there in your college?	
4	No. of motors used for pumping water from each well?	
5	What is the total horse power of each motor?	
6	What is the depth of each well?	
7	What is the present depth of water in each well?	
8	How does your college store water?	Underground Sumps and 10 Overhead Tanks
9	Quantity of water stored in your overhead water tank? (In liters)	10 Overhead Tanks x 2000 Capacity = 20000 liters
10	Quantity of water pumped every day? (In liters)	20000 litres
11	If there is water wastage, specify why.	No
12	How can the wastage be prevented / stopped?	Low Flow Faucets
13	Locate the point of entry of water and point of exit of waste water in your college.	Near the main gate entrance and exit of wastewater through the drains at NW Direction
14	Where does waste water come from?	Canteen, Labs, Washrooms
15	Where does the waste water go?	Sewer lines
16	What are the uses of waste water in your college?	NA
17	What happens to the water used in your labs? Whether it gets mixed with ground water?	No
18	Is there any treatment for the lab water?	Yes, Neutralization
19	Whether green chemistry methods are practiced in your labs?	No
20	Write down four ways that could reduce the amount of water used in your college.	Close the taps after usage. Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage. Water conservation awareness for students.
21	Record water use from the college water meter for six	

	months.	

22	Bimonthly water charges paid to water connections if any	
23	No. of water coolers. Amount of water used per day? (In liters)	2 water coolers – 60 liters
24	No. of water taps. Amount of water used per day?	80 Taps and 2000 Liters
25	No. of bath rooms in staff rooms, common, hostels. Amount of water used per day?	Staff rooms – 6 Students -30, and 1200 Liters
26	No. of toilet, urinals. Amount of water used per day?	
27	No. of water taps in the canteen. Amount of water used per day?	Two Taps and 200 Liters
28	Amount of water used per day for garden use.	2500 Liters
29	No. of water taps in laboratories. Amount of water used per day in each lab?	26 Taps and 400 Liters
30	Total use of water in each hostel?	NA
31	At the end of the period, compile a table to show how many liters of water have been used in the college for each purpose	
32	Is there any water used for agricultural purposes?	No
33	Does your college harvest rain water?	Yes
34	If yes, how many rain water harvesting units are there? (Approx. amount)	Two rain water harvest Pits and Dimensions - 7x5x3 Feet
35	How many of the taps are leaky? Amount of water lost per day?	Nil
36	Are there signs reminding people to turn off the water? Yes / No	Yes, By sign Boards
37	Is there any waterless toilets?	No
38	How many water fountains are there?	Nil
39	How many water fountains are leaky?	Nil
40	Is drip irrigation used to water plants outside? YES/NO	No
41	How often is the garden watered?	1 time per day
42	Quantity of water used to watering the ground?	500 l
43	Quantity of water used for bus cleaning? (Liters per day)	No
44	Amount of water for other uses? (Items not mentioned above)	No
45	Area of the college land without tree/building canopy.	

46	Is there any water management plan in the college?	Water management audit conducted

47	Are there any water saving techniques followed in your college? What are they?	No
48	Please share Some IDEA for how your college could save more water.	• Automatic Control system to minimise water losses from overhead tanks • Low Flow Faucets • Drip Irrigation for Greenbelt Development

SL NO	PARAMETERS	Response	Remark s
1	Source of water	HMWSSB and Bore wells	
2	No. of Wells		
3	No. of motors used		
4	Horse power - Motor		
5	Depth of well -Total	NA	
6	Water level		
7	Number of water tanks	10 Overhead Tanks	
8	Capacity of tank	20000 liters	
9	Quantity of water pumped every day	20000 liters	
10	Any water wastage/why?	No	
11	Water usage for gardening	Yes	
12	Waste water sources	Toilets	
13	Use of waste water	No	
14	Faith of waste water from labs		
15	Whether waste water from labs mixed with ground water	No	
16	Any treatment for lab water	Neutralization	
17	Whether any green chemistry method practiced in labs		
18	No. of water coolers	2	
19	Rain water harvest available?	2	
20	No. of units and amount of water harvested	2	
21	Any leaky taps	No	
22	Amount of water lost per day	No	
23	Any water management plan used?	Yes	
24	Any water saving techniques followed?	No	

25	Are there any signs reminding peoples to turn off the water?	Yes	

Water Quality assessment

Water samples were collected and analysed for its quality parameters. The samples include Bore water and Municipal water which are the main water source of the college campus. which is used for canteen and drinking water and cooler systems. The major parameters analyzed include dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, conductivity, total dissolved solids and salinity. The results are presented in the Table XX The results are comparable with the values of drinking water standards prescribed by different agencies

Results of water quality

Parameters	**Bore Well water**	**Municipal Tap water**	**Standard value (BIS)**
Dissolved Oxygen (mg/l)	5.2	5.6	6-8
Acidity (mg/l)			200
Alkalinity (mg/l)	120	90	200
Chloride (mg/l)	72	43	250
Hardness (Total)	100	85	200
Conductivity (ps)	390	298	
Ph.	7.02	6.95	6.5-8.5
Total Dissolved Solids (ppm)	261	198	500
Salinity (ppt)			
Total coliform	Absent	Absent	0
Fecal coliform	Absent	Absent	0

3.4 Energy audit

Energy audit is the key to systematic approach for decision making in the sphere of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies the energy usage according to its discrete functions. The energy is utilized in the Campus for lighting, space heating and cooling, running of laboratory instruments, appliances, water heating, ground water pumping, cooking and transportation.

AUDITING FOR ENERGY MANAGEMENT		
1	List ways that you use energy in your college. (Electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others).	Solar Energy, Use of LED Bulbs
2	Electricity bill amount for the last year	33,000/ per month
3	Amount paid for LPG cylinders for last one year	10,000/

4	Weight of firewood used per month and amount of money spent? Also mention the amount spent for petrol/diesel/ others for generators?	10 litres of petrol per month
5	Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some.	Solar Energy, Use of LED Bulbs
6	How much money does your college spend on energy such as electricity, gas, firewood, etc. in a month?	35,000/per month
7	How many CFL bulbs has your college installed? Mention use (Hours used/day for how many days in a month)	100 bulbs per 6hours /day
8	Energy used by each bulb per month? (For example- 60 watt bulb x 4hours x number of bulbs = Kwh). 9. How many LED bulbs are used in your college? Mention the use (Hours used/day for how many days in a month)	100 bulbs/6hours/day
9	Energy used by each bulb per month? (kWh).	33000Rs.per month
10	How many incandescent (tungsten) bulbs have your college installed? Mentions use (Hours used/day for how many days in a month)	50/6hours/day
11	Energy used by each bulb per month? (kWh).	33000 Rs per month
12	How many fans are installed in your college? Mention use (Hours used/day for how many days in a month)	100
13	Energy used by each fan per month? (kWh).	300 units per month
14	How many air conditioners are installed in your college? Mention use (Hours used/day, for how many days in a month)	20
15	Energy used by each air conditioner per month? (kWh).	50 units
16	How many electrical equipment including weighing balance are installed your college? Mention the use (Hours used/day for how many days in a month)	1000
17	Energy used by each electrical equipment per month? (kWh).	3units
18	How many computers are there in your college? Mention the use (Hours used/day for how many days in a month)	250
19	Energy used by each computer per month? (kWh).	100

20	How many photocopiers are installed by your college? Mention use (Hours used/day for how many days in a month).	5no
21	How many cooling apparatus are in installed in your college? Mention use (Hours used/day for how many days in a month	Nil
22	Energy used by each cooling apparatus per month? (kWh) Mention use (Hours used/day for how many days in a month)	Nil
23	Energy used by each photocopier per month? (Kwh) Mention the use (Hours used/day for how many days in a month) how many inverters your college installed? Mentions use (Hours used/day for how many days in a month)	50
24	Energy used by each inverter per month? (kWh).	Nil
25	How many electrical equipment are used in different labs of your college? Mention the use (Hours used/day for how many days in a month)	1000/6hours/day
26	Energy used by each equipment per month? (kWh)	5-10 units
27	How many heaters are used in the canteen of your college? Mention the use (Hours used/day for how many days in a month)	Nil
28	Energy used by each heater per month? (kWh)	Nil
29	No of street lights in your college?	10
30	Energy used by each street light per month? (kWh)	50
31	No of TV in your college and hostels?	1no
32	Energy used by each TV per month? (kWh)	2-5
33	Any other item that uses energy (Please write the energy used per month) Mention the use (Hours used/day for how many days in a month)	Nil
34	Are any alternative energy sources/nonconventional energy sources employed / installed in your college? (Photovoltaic cells for solar energy, windmill, energy efficient stoves, etc..) Specify.	Photovoltaic cells for solar energy
35	Do you run "switch off" drills at college?	No
36	Are your computers and other equipment put on power-saving mode?	Yes
37	Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby mode most of the time? If yes, how many hours?	6 hours

38	What are the energy conservation methods adopted by your college?	Solar Energy
39	How many boards displayed for saving energy awareness?	10
40	How much ash is collected after burning fire wood per day in the canteen?	Nil
41	Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future. Calculation of energy for electrical appliances Appliance Power used in (watt) Usage per day (hours) Number of appliances Average kWh per day (Watt X hours X Number X 1000) Average kWh per month (Watt X hours X Number X 1000 x 30) Incandescent bulb 60-watt CFL 18 W Microwave 1000W Stove 3000W Kettle 2500W	Installation of more number of solar panels such that our Electricity bill can be reduced to zero

The institute received a grant from RUSA for installation of solar panels. Uniscan Power Systems installed 10 kw solar panels for supplying electric power to the college building. Due to this, approximately 8481 kwh/year electricity is being saved.

Roof top solar panels

Energy Audit

Sl. N	Electrical appliances/	Number	Power (W)/	Tot al power	kW	Operation	kW/hr	No.of days	Total consump
1	CFL	50	14	700	0.7	4	2.8	25	70
2	TUBE	200	38	7600	7.6	4	30.4	25	760
3	LED BULB	100	9	900	0.9	4	3.6	25	90
4	LED TUBE	40	20	800	0.8	4	3.2	15	48
5	PROJECTOR	5	280	1400	1.4	1	1.4	25	35
6	SPEAKER	30	10	300	0.3	1	0.3	25	7.5
7	FAN	150	60	9000	9	4	36	20	720
8	COMPUTER	125	250	31250	31.25	4	125	20	2500
9	LAPTOPS	10	50	500	0.5	4	2	20	40
10	PRINTERS	5	60	300	0.3	1	0.3	20	6
11	PHOTOSTAT MACHINE	2	650	1300	1.3	2	2.6	15	39
12	SCANNER	1	50	50	0.05	0.5	0.025	15	0.375
13	UPS	5	1000	5000	5	12	60	20	1200
14	INDUCTION	1	2000	2000	2	0.25	0.5	15	7.5
15	A/C	10	7000	70000	70	1	70	15	1050
16	REFRIGERATOR	2	150	300	0.3	24	7.2	30	216
17	TABLE FAN	5	55	275	0.275	2	0.55	25	13.75
18	MIXER GRINDER	2	750	1500	1.5	2	3	15	45
19	OVEN	3	1500	4500	4.5	2	9	10	90
20	CENTRIFUGE	2	850	1700	1.7	0.25	0.425	8	3.4
21	AUTOCLAVE	1	1700	1700	1.7	1	1.7	4	6.8
22	ULTRASOUND	1	700	700	0.7	0.25	0.175	5	0.875
23	LAMINAR FLOW	1	600	600	0.6	1	0.6	15	9
24	EXHAUST FAN	1	32	32	0.032	4	0.128	25	3.2
28	INCUBATOR	2	40	80	0.08	4	0.32	25	8
29	DISTILLATION unit	1	1000	1000	1	1	1	12	12
30	SANITARY NAPKIN INCINERA TOR	2	1200	2400	2.4	1	2.4	25	60
31	CCTV DVR	10	10	100	0.1	24	2.4	30	720
							367.02	**529**	**7761.4**

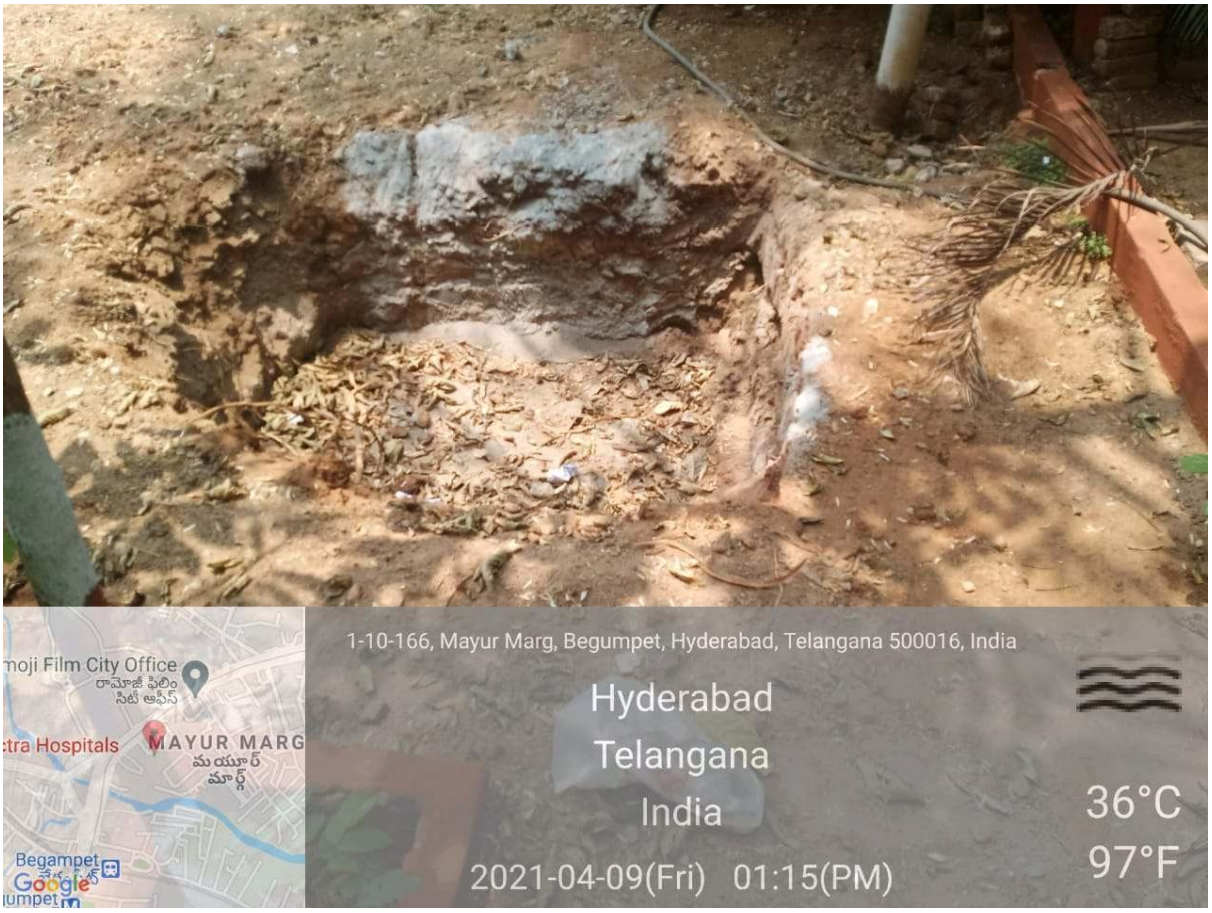
3.5 WASTE MANAGEMENT

The working hours of the college is about seven hours which includes a lunch break. The administrative effort of managing such a large area and people is therefore considerable. Among various requirements the waste management & minimization has been accorded high priority to maintain hygiene and to keep the area clean and tidy at all times.

The various types of waste generated in the campus are

Solid waste

The solid waste management is in order with the installation of dust bins and their daily cleaning. The college has its own collection facility that collects the solid wastes daily from the campus. This helps in maintaining the cleanliness by providing an efficient, safe and regulated management of solid wastes in the Campus. Segregation at source into bio-degradable, non bio- degradable and Domestic Hazardous wastes. It is noteworthy that campus has adopted an environmentally sound practice of converting biodegradable waste into vermicompost which is a useful resource. The vermicompost produced is used as manure for green area development. Disposal of recyclable waste to Authorized Waste Pickers / Authorized Recyclers. Balance segregated waste given to Authorized Agency of Local Body.



Vermicompost pit

LIQUID WASTE: Sewage and drains of washrooms, kitchen.

E- WASTE: Printed Circuit board, Computer hardware such as life expired printers, computers, defective electronic equipment of labs etc.

The college management has adopted various measures towards prompt and safe disposal of all the above-mentioned waste. With an in-depth understanding of the harmful effects caused by plastic, the college has been notified as a plastic free environment. The college encourages handling of college products either using steel implements such as containers, spoons, plates etc or biodegradable paper cups, plates etc. To sensitise and create awareness among students, conspicuous boards have been set up against the use of plastic. The college also adopts the efficient concept of the 3R's namely Reduce, Reuse and Recycle to dispose waste. For handling of handling of day to day waste generated due to consumption by the students and teachers, the dust bins have been segregated into dry and wet waste and collected by GHMC regularly. The packaging material is reused for transportation from college to other places. All the used newspapers and magazines are disposed through scrap dealers

<table>
<tr><td colspan="3">AUDITING FOR WASTE MANAGEMENT</td></tr>
<tr><td>1.</td><td>What is the total strength of students, teachers and non-teaching staff in your college?</td><td>3765</td></tr>
<tr><td>2.</td><td>No. of Students; No. of Teachers; No. Non-teaching staff; Gents - Ladies Total</td><td>
<table>
<tr><td>Strength</td><td>Male</td><td>Female</td><td>Total</td></tr>
<tr><td>No of students</td><td>--</td><td>3676</td><td>3676</td></tr>
<tr><td>No of Teaching Staff</td><td>09</td><td>44</td><td>53</td></tr>
<tr><td>No of Non-Teaching staff</td><td>22</td><td>14</td><td>36</td></tr>
<tr><td>Strength</td><td>Male</td><td>Female</td><td>Total</td></tr>
<tr><td>No of students</td><td>--</td><td>3676</td><td>3676</td></tr>
</table>
</td></tr>
</table>

3.	Which of the following are available in your college? Give area occupied, Garden area and Garbage dump Playground area, Laboratory, Kitchen, Canteen, Toilets, Car/scooter shed area Number of class rooms, Office rooms and others (specify)	Give area occupied, Garden area – 1 and Garbage dump - 2 Playground area-1, Laboratory-13, Kitchen, Canteen-1, Toilets -36 Car/scooter shed area Number of class rooms -55 Office rooms -1 and others (specify)

4.	Which of the following are found near your college? Mark the level of disturbance it creates for the college in a scale of 1 to 9. Municipal dump yard Garbage heap Public convenience Sewer line Stagnant water Open drainage Industry - (Mention the type) Bus Stop / Railway station Market /shopping complex / public halls	1. Bus Stop 2. Shopping Complex 3. Public Convenience Sewer Line 4.Open drainage Industry - (Mention the type) 5. Public Halls 6.Garbage Heap 7.Municipal dump yard 8. Railway station Market 9.Stagnant water
	WASTE	
5.	Does your college generate any waste? If so, what are they? How much quantity?	Solid Waste, Canteen Waste, Dry leaves, E-waste, Hazardous waste, Glass, Unused equipment's.
6.	Number or weight E-waste Hazardous waste (toxic)	
7.	Solid waste Dry leaves Canteen waste Liquid waste Glass Unused equipment Medical waste if any Napkins Others (Specify)	Solid waste – 5kg /Day Dry leaves – 5kg /Day Canteen waste– 15 kg /Day Liquid waste– 5 Liters/Day Glass – 50 kg/Year Unused equipment – 100 kg/Year Medical waste if any - No Napkins Others (Specify) - 5kg /Day
8.	Is there any waste treatment system in the college?	Yes, Vermicomposting
9.	Is there any treatment for toilet/urinal/sanitary napkin waste?	Yes, Napkin Incinerator
10.	What is the approximate quantity of waste generated per day? (in Kilograms) Office Laboratories Canteen/kitchen	50 kg
11.	Why waste is a problem?	Odour issues
12.	Whether waste is polluting ground/surface water? How?	No
13.	Whether waste is polluting the air of the college? How?	No
14.	How is the waste generated in the college managed? Methods Composting Recycling Reusing Others (specify)	1. Composting 2. Recycling 3. Reusing

15.	How many separate boxes do you think you would need to put into a classroom to start a waste segregation and recycling campaign? What should be the use for each box? (Develop a Colour code with reasons)	2 Boxes namely Blue and Green for Dry Waste and Wet Waste
16.	Do you use recycled paper in College?	No

17.	Is there any waste wealth program practiced in the college? Approx. Bio degradable Non-Bio degradable Hazardous Others < 1 kg. 2 - 10 kg. > 10 kg. Approx. Bio degradable Non-Bio degradable Hazardous Others < 1 kg. 2 - 10 kg. > 10 kg. Approx. Bio degradable Non-Bio degradable Hazardous Others < 1 kg. 2 - 10 kg. > 10 kg.	Yes, they are selling the old papers
18.	How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.	No
19.	Can you achieve zero garbage in your college? (Reduce, Recycle, Reuse, Refuse) If yes, how?	Yes, we follow the No Plastic Zone. Awareness programmes are conducted on regular basis by the NSS volunteers to use eco-friendly cloth and jute bags with banners stating *'Say No to Plastic'.*

3.6 Plantation audit

Many departments of the college maintain their own small gardens. Due to extensive plantation drives the campus is turned into a lush green spot with fair magnitude of biodiversity. More the 50% area of the campus is green having different species including pines, broad leaved trees, shrubs, and perennial herbs.

A green campus is a place where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus. The green campus concept offers an institution the opportunity to take the lead in redefining its environmental, social economic needs of the mankind. The green campus practice is a boon to promote mental and physical health of the students and staff. The following are the details of trees available in the campus:

AUDITING FOR GREEN CAMPUS MANAGEMENT		
1.	Is there a garden in your college? Area?	Yes. The college has Medicinal as well as ornamental Garden. 1.Area of medicinal garden is 35x30 feet 2. Area of the Ornamental Garden is 143x20 feet
2.	Do students spend time in the garden?	Yes. It is planted and maintained by the students.
3.	List the plants in the garden, with approx. numbers of each species.	Annexure -1 (List of Plant species with numbers In the Ornamental Garden)
4.	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Due to space constraint Vegetable plants and herbs are suggested.
5.	List the species planted by the students, with numbers.	Plants in the Gardens and TKHH Plantation was done by the students (List

		of Species with numbers information is available in the ANNEXURE-1, ANNEXURE-2 and in TKHH plantation data)

6.	Whether you have displayed scientific names of the trees in the campus?	Yes. With the help of QR codes. (Report on QR codes attached)
7.	Is there any plantations in your campus? If yes specify area and type of plantation.	Plantation in Telangana ku Haritha Haram program (TKHH). (Area and type of plantation Information available in TKHH data).
8.	Is there any vegetable garden in your college? If yes how much area?	Small vegetable garden is started this year in 5x1 meter area.
9.	Is there any medicinal garden in your college? If yes how much area?	Yes. It is in 35x30 feet.
10.	What are the vegetables cultivated in your vegetable garden? (Mention the quantity of harvest in each season)	Leafy vegetables which include spinach (Palakura), Amaranth (Thotakura), Coriander (Kothimeera), Methi (Menthikura), Mint (Pudina). Hibiscus cannabinus (Gongura). Not harvested yet.
11.	How much water is used in the vegetable garden and other gardens? (Mention the source and quantity of water used).	Approx. 250 liters/day
12.	Who is in charge of gardens in your college?	I/c Head, Department of Botany
13.	Are you using any type of recycled water in your garden?	No
14.	List the name and quantity of pesticides and fertilizers used in your gardens?	Neem Oil as pesticide and Vermicompost as fertilizer
15.	Whether you are doing organic farming in your college? How?	Yes. Using Neem Oil as pesticide and Vermicompost as fertilizer
16.	Do you have any composting pit in your college? If yes, what are you doing with the compost generated?	Yes. Vermicompost pit. The compost generated in the pit is used as fertilizer for the Plantation in our college.
17.	What do you doing with the vegetables harvested? Do you have any student market?	Not yet harvested.
18.	Is there any botanical garden in your campus? If yes give the details of campus flora.	No
19.	Give the number and names of the medicinal plants in your college campus.	Annexures II (List of Plant species with numbers In the Medicinal Garden)

20.	Any threatened plant species planted/conserved?	No
21.	Is there a nature club in your college? If yes what are their activities?	No. Eco-club is there in our College
22.	Is there any arboretum in your college? If yes details of the trees planted.	No

23.	Is there any fruit yielding plants in your college? If yes details of the trees planted.	Yes. 1.*Mangifera indica* 2. *Syzygium cumini* (Neredu)3. *Annona squamosa* 4. *Citrus sinensis* (Sweet lemon), 5. *Punica granatum* (Danimma), 6. *Achras sapota* (Sapota), 7. *Citrus aurantium* (Narinja), 8. *Carica papaya* (papaya), 9. *Psidium gujava*(Guava), 10. *Cocos Nucifera*(Coconut) 11.*Terminalia catappa* (Badam)
24.	Is there any groves in your college? If yes details of the trees planted.	No
25.	Is there any irrigation system in your college?	No
26.	What is the type of vegetation in the surrounding area of the college	Trees
27.	What are the nature awareness programmes conducted in the campus?	1. Preparation of Clay Ganesha idols by the students 2. World Environment Day Celebrations. 3. Students participated in various competitions on World wet lands day celebrations organized by BSI and won prizes 4. Students participated in various competitions on World Ozone Day celebrations organized by BSI & ZSI 4. Planting of saplings in Telangana ku Haritha Haram programme (Every year)
28.	What is the involvement of students in the green cover maintenance?	Gardens maintenance and participation in the TKHH Plantation
29.	What is the total area of the campus under tree cover? Or under tree canopy?	1/3 of the college is under tree cover/tree canopy
30.	Share your IDEAS for further improvement of green cover	Due to space constraint Vegetable plants and herbs are suggested to improve the green cover

Annexure – I

S.No.	Common Name	Botanical Name	Number of plants
Plants in the Ornamental Garden			
1	Parijatham	*Nyctanthus arbortritis*	2

S.No.	Common Name	Botanical Name	Number of plants
2	Swarna ganneru	*Tecoma stans*	33
3	Deva ganneru	*Plumeria alba*	10
4	Kagaj ka phool	*Bougainvillea spectabilis*	1
5	Nooru varahalu	*Ixora coccinea*	13
6	Ganneru	*Nerium oleander*	4
7	Rose	*Rosa Indica*	107
8	Rose	*Rosa alba*	52
9	Rekka mandara	*Hibiscus rosa sinensis*	11
10	Maidaku	*Lawsonia inermis*	4
11	Areca palm	Areca palm	14
12	periwinkle	Catharanthus roseus	3

Annexure – II

S.No.	Common Name	Botanical Name	Number of plants
Medicinal Plants			
1	Nela usiri	*Phyllanthus niruri*	1
2	Citrus	*Citrus aurantifolia*	1
3	Indian mint	*Plectranthus ambionicus*	1
4	Addasaramu	*Adhatoda vasica* Nees.	1
5	Ashoka	*Saraca indica* sensu Bedd., non L	1
6	Aswagandha	*Withania somnifera* (L.) Dunal	1
7	Coleus	*Coleus amboinicus Lour.*	1
8	Dumparashtram	*Alpinia calcarata* (Haw.) Roscoe	1
9	Eka bilvam	*Aegle marmelos*(L.) Correa	1
10	Geranium	*Pelargonium graveolens* L 'Her.	1
11	Gurivinda	*Abrus precatorius* L.	1
12	Insulin	*Costus igneus* N.E.Br.	1
13	Jala brahmi	*Bacopa monnieri*(L.) Pennell	1
14	Kadujemudu	*Euphorbia tirucalli* L.	1
15	Kalabanda	*Aloe vera* (L.) Burm.f.	1
16	Kondapindichettu	*Aerva lanata* L.	1
17	Lavanga Tulasi	*Ocimum gratissimum* L.	1
18	Lavender	*Lavandula spica* L.	1
19	Lemon grass	*Cymbopogon flexuosus*(Nees ex Steud.) W.Watson	1
20	Machi-patri	*Artemisia indica* L.	1
21	Mint Pudina	*Mentha arvensis* L.	1
22	Multivitamin	*Sauropus androgynus* (L.) Merr.	1
23	Nalleru	*Cissus quadrangularis* L.	1

24	Pulichinta	*Biophytum sensitivum* (L.) DC.	1
26	Rama Tulasi	*Ocimum sanctum* L.	1
27	Ranapala	*Kalanchoe lanceolata* (Forssk.) Pers.	1
28	Sabja	*Ocimum basilicum* L.	1

S.No.	Common Name	Botanical Name	Number of plants
29	Sadaapaku	*Ruta chalepensis* L.	1
30	Shankhapushpi	*Clitoria ternatea* L.	1
31	Shatavari	*Asparagus racemosus* Willd.	1
32	Thella maddi	*Terminalia arjuna* (Roxb.) Wight & Arn.	1
33	Tippatega	*Tinospora cordifolia* (Thunb.)Miers	1
34	Usiri	*Phyllanthus emblica L.*	1
35	Vamaku	*Coleus aromaticus* Benth.	1
36	Vasa	*Acorus calamus* L.	1
37	Wild garlic	*Allium ursinum* L.	1
38	Nalleru	*Cissus quadrangularis*	1
39	Tamalapaku	*Piper betel*	1

REPORT ON THE GENERATION OF QR CODES FOR PLANTS IN THE COLLEGE CAMPUS

A quick response (QR) code is **a type of barcode that can be read easily by a digital device and which stores information as a series of pixels in a square-shaped grid**. QR codes are frequently used to track information about products in a supply chain and often used in marketing and advertising campaigns. Now it is used in various fields.

One of the applications includes the Generation of QR Codes for plants which provide the information regarding the Plants.

Department of Botany, Government Degree College for Women(A), Begumpet (is the first Government college in Hyderabad District) has taken initiative to generate the QR Codes for Plants present in the College Campus.

QR code of a particular plant provides the information such as Botanical Name, Common name, Family to which it belongs to and the economic importance (Uses) of that plant.

Dr. Rajendra Singh, JD (in-charge), Dr. Soundarya Joseph, Project Officer, RUSA and Dr.T.V. Chary, Academic Officer from Academic Cell visited the Botany Department on 30-03-2021 and inaugurated QR coding of trees in the campus.

Now a days most of the students are having the smart phone and the student from any discipline having curiosity to know about the information of the plant in the campus can use any scanning app available on the phones to get all the information they need to know about the tree, from its scientific name to its uses.

There are about 94 plant species are available in our college campus. Out of 94 species 39 species are Medicinal plants, which are grown in the medicinal garden and 12 species are grown in the ornamental garden and We have given QR codes for total species. The following annexure gives information regarding plants with QR codes.

S.No.	Common Name	Botanical Name
1	Nara Mamidi	*Polyalthia longifolia*
2	Mango	*Mangifera indica*
3	Neem	*Azadiracta indica*
4	Custard Apple	*Anonna squamosa*
5	Jamun	*Syzygium cumini*
6	Pin wheel flower	*Tabernaemontana divaricata*
7	Nut Tree	*Areca catechu*
8	Coconut	*Cocos nucifera*
9	Chama	*Colacasia esculenta*
10	Ganuga	*Pongamia pinnata*
11	Teak Wood	*Tectona grandis*
12	Karyapak	*Murraya Koenigii*
13	Desi Badam	*Terminalia catappa*
14	Medi chettu	*Ficus racemosa*
15	Maredu	*Aegle marmelos*
16	Saptha parni	*Alstonia scholaris*
17	Bottle brush tree	*Callistemon lanceolatus*
18	African Tulip	*Spathodia companulata*
19	Copper pod	*Peltophorum pterocarpum*
20	Ippa, Indian mdlar	*Mimusops elengi*
21	Fern leaf tree	*Filicium decipiens*
22	Macarthur palm	*Ptychosperma macarthurii*
23	Parijatham	*Nyctanthus arbortritis*
24	Punnaga	*Millingtonia hortensis*
25	Peacock flower	*Caesalpinaceae pulcherrima*

26	Peepal tree	*Ficus religiosa*
27	Red edge dracaena	*Dracaena marginata*
28	Rela	*Cassia fistula*
29	Sapodila	*Achras sapota*
30	Sour orange	*Citrus aurantium*
31	Subabul	*Leucaena leucocephala*
32	Chintha	*Tamarindus indica*
33	Button wood	*Conocarpus erectus*
34	Cassava	*Manilhot esculenta*
35	Swarna ganneru	*Tecoma stans*
36	Bamboo	*Bamboosa bambos*
37	Akshintha poolu	*Lantana camara*
38	Deva ganneru	*Plumeria alba*
39	Garden croton	*Codiaeum variegatum*
40	Kagaj ka phool	*Bougainvillea spectabilis*
41	Golden dew drop	*Duranta erecta*
42	Mirapa mandaram	*Malvaviscus arboreus*
43	Mogili kewda	*Pandanus odoratissimus*
44	Mussaenda	*Mussaenda frondosa*
45	Night queen	*Cestrum nocturnum*
46	Nooru varahalu	*Ixora coccinea*
47	Ganneru	*Nerium oleander*
48	Erra jilledu	*Calotropis procera*
49	Rose	*Rosa Indica*
50	Rekka mandara	*Hibiscus rosa sinensis*
51	Danimma	*Punica granatum*
52	Maidaku	*Lawsonia inermis*
53	Papaya	*Carica papya*
54	Spider plant	*Chlorophytum comosum*
55	Sun flower	*Helianthus annuus*
	Medicinal Plants	
1	Nela usiri	*Phyllanthus niruri*
2	Citrus	*Citrus aurantifolia*
3	Indian mint	*Plectranthus ambionicus*
4	Addasaramu	*Adhatoda vasica* Nees.
5	Ashoka	*Saraca indica* sensu Bedd., non L
6	Aswagandha	*Withania somnifera* (L.) Dunal
7	Coleus	*Coleus amboinicus Lour.*
8	Dumparashtram	*Alpinia calcarata* (Haw.) Roscoe
9	Eka bilvam	*Aegle marmelos*(L.) Correa
10	Geranium	*Pelargonium graveolens* L 'Her.
11	Gurivinda	*Abrus precatorius* L.
12	Insulin	*Costus igneus* N.E.Br.
13	Jala brahmi	*Bacopa monnieri*(L.) Pennell
14	Kadujemudu	*Euphorbia tirucalli* L.
15	Kalabanda	*Aloe vera* (L.) Burm.f.
16	Kondapindichettu	*Aerva lanata* L.
17	Lavanga Tulasi	*Ocimum gratissimum* L.
18	Lavender	*Lavandula spica* L.

19	Lemon grass	*Cymbopogon flexuosus*(Nees ex Steud.) W.Watson
20	Machi-patri	*Artemisia indica* L.
21	Mint Pudina	*Mentha arvensis* L.
22	Multivitamin	*Sauropus androgynus* (L.) Merr.
23	Nalleru	*Cissus quadrangularis* L.
24	Pulichinta	*Biophytum sensitivum* (L.) DC.
26	Rama Tulasi	*Ocimum sanctum* L.
27	Ranapala	*Kalanchoe lanceolata* (Forssk.) Pers.
28	Sabja	*Ocimum basilicum* L.
29	Sadaapaku	*Ruta chalepensis* L.
30	Shankhapushpi	*Clitoria ternatea* L.
31	Shatavari	*Asparagus racemosus* Willd.
32	Thella maddi	*Terminalia arjuna* (Roxb.) Wight & Arn.
33	Tippatega	*Tinospora cordifolia* (Thunb.)Miers
34	Usiri	*Phyllanthus emblica L.*
35	Vamaku	*Coleus aromaticus* Benth.
36	Vasa	*Acorus calamus* L.
37	Wild garlic	*Allium ursinum* L.
38	Nalleru	*Cissus quadrangularis*
39	Tamalapaku	*Piper betel*

Carbon Foot Print Analysis

<table>
<tr><th colspan="3">AUDITING FOR CARBON FOOTPRINT</th></tr>
<tr><td>1.</td><td>What is the total strength of students and teachers in your college?
No. of Students No. of Teachers No. of Non-teaching staff Gents Ladies
Total</td><td>Total:3765
<table>
<tr><td>Strength</td><td>Male</td><td>Female</td><td>Total</td></tr>
<tr><td>No of students</td><td>--</td><td>3676</td><td>3676</td></tr>
<tr><td>No of Teaching Staff</td><td>09</td><td>44</td><td>53</td></tr>
<tr><td>No of Non-Teaching staff</td><td>22</td><td>14</td><td>36</td></tr>
<tr><td>Strength</td><td>Male</td><td>Female</td><td>Total</td></tr>
</table></td></tr>
<tr><td>2.</td><td>Total Number of vehicles used by the stakeholders of the college. (per day)</td><td>Teaching staff – 20
Two Wheelers –9
Four Wheelers - 11</td></tr>
<tr><td>3.</td><td>No. of cycles used</td><td>No</td></tr>
<tr><td>4.</td><td>No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day)</td><td>Two Wheelers –9
88 km – 4 liters.220 milli Liters</td></tr>
</table>

5.	No. of cars used (average distance travelled and quantity of fuel and amount used per day)	Four Wheelers - 11 143 km – 74 Liters 220 milli Liters
6.	No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used per day)	2 Persons 27 km – 2 Liters 220 milli Liters
7.	No. of persons using college conveyance by the students, non-teaching staff and teachers (average distance travelled and quantity of fuel and amount used per day)	none

8.	Number of parent-teacher meetings in a year? Parents turned up (approx.)	In 2020-2021 due to pandemic no PTA meeting
9.	Number of visitors with vehicles per day?	50
10.	Number of generators used per day (hours). Give the amount of fuel used per day.	none
11.	Number of LPG cylinders used in the canteen (Give the amount of fuel used per day and amount spent).	3 cylinders
12.	Quantity of kerosene used in the canteen/labs (Give the amount of fuel used per day and amount spent).	
13.	Amount of taxi/auto charges paid and the amount of fuel used per month for the transportation of vegetables and other materials to canteen.	
14.	Amount of taxi/auto charges paid per month for the transportation of office goods to the college.	
15.	Average amount of taxi/auto charges paid per month by the stakeholders of the college	
16.	Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent).	NA
17.	Suggest the methods to reduce the quantity of use of fuel used by the stakeholders/students/teachers/non-teaching staff of the college.	
18.	Are the Rooms in Campus are Well Ventilated? Yes/No	Yes
19.	Window Floor ratio of the Rooms Good/Not Enough	Good

Carbon Footprint

1. Number of cycles used: 0
2. No: of two wheelers used: 9
   - Average distance travelled: 10 km
   - Average quantity of fuel used: 3 Ltr
3. No: of cars used: 11
   - Average distance travelled: 153 km/8 km= 13.9 km
   - Average quantity of fuel used: 1 Ltr

(Per person to and fro 40 Kms=1L) Fuel used by four wheelers (11 Persons) - 110 L
(Per person to and fro 40 Kms=2L) Fuel for persons (total 10 persons) travelling by common

4. Transportation =40 L (4L x 10 persons)
   - Total fossil fuel use is 153 L / day
   - Total fuel cost per day for transportation =Rs. 15300/- (153 L x Rs 100)
   - Cost of stakeholder transportation per month (Rs.15300x22 days) - Rs.336600

Air quality Determination: Air Quality Index (parameters studied/recorded/ Seasonal):

NO2	19
NO	-
O3	18
PM2.5	29
PM10	67
CO	3.1
Humidity	78
Barometric Pressure	1010
Wind Speed	6 km/Hour
Wind Direction	ESE
Sun Rise	6.06AM
Sun Set	6.05 PM

Measurements of Noise level in, and around the college

S.No.	place (S)	Measurements (Duration in seconds)	Minimum (dBA)	Maximum (dBA)	Average (dBA)
1	Library	60	37	42	39.5
2	Canteen	60	48	52	50
3	Play ground	60	54	62	58
4	Auditorium	60	56	65	60.5
5	Science Block	60	45	51	48
6	Any Other (Specify)	--	--	--	--

4.1 Recommendations

- One Rainwater harvesting pit is established in the college campus future needs of water. Further, rainwater pits can be prepared at appropriate places identified in and around the campus.
- The public lights within the campus may be run with solar panels and the replacement of existing lights should be done with LED lamps.
- Fire safety instruments should be installed in all the buildings.
- Water Meter may be installed for monitoring of water consumption for landscape
- Reduction in use of paper work by going digital
- Avoid use of personal vehicles inside the campus.
- Formulation of Environment Policy and communicated to all faculties and other staff members.

5.0 Conclusion

periodic inspection of buildings housekeeping and environment policy.

This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. Overall, 60% of the campus is for landscaping. The audit has several observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for campus team to initiate actions. The audit team opines that the overall site is maintained well from environmental perspective. There is no major observations but few things are important to initiate urgently are 1)waste management records
2) bi monthly inventory of hazardous waste
rainwater harvesting recharge; water balance cycle and, regular inspection of building infrastructure.