

GREEN ENERGY & ENVIRONMENT AUDIT REPORT | 2019

GREEN AUDIT REPORT - 2019


is presented to
**ADICHUNCHANAGIRI
UNIVERSITY**

Nagamangala Taluk, BG Nagara – 571 448

has successfully demonstrated knowledge on Energy conservation,
Water conservation, Bio diversity, Waste management, Indoor
Environmental quality, Carbon footprint.

16.01.2020

DATE



NISCHAY N
GREEN BUILDING CONSULTANT

Disclaimer

Green Audit team has prepared this report for Adichunchanagiri University based on input data submitted by the representatives of the University and is complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered. It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Executive Summary

Universities and Institutions have broad impacts on the world around them, both negative and positive. A nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with the environment. The activities pursued by University can create a variety of environmental impacts. A clean and healthy environment aids effective learning and provides a conducive learning environment. Adichunchanagiri University is very sensitive to environmental factors as more concepts are being introduced to make them eco-friendly.

Adichunchanagiri University expresses its commitment to sustainability in many ways. It has taken a number of positive steps to reduce its environmental impact. But many areas remain in which substantial improvements can be made. This report serves to highlight Adichunchanagiri University's many accomplishments, and to make recommendations for improving the University's environmental sustainability. The University has conducted the Green Audit, Energy and Environment for the year **2019** and strives to maintain eco-friendly atmosphere on the campus.

The aim of the report is to identify scope for improvement and recommend implementable and economically viable solutions in achieving the most optimized utilization of energy and water in the campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Therefore, it is imperative that the University evaluate its own contributions toward a sustainable future.

The initiatives taken by the University to make the campus Ecofriendly:

1. Energy conservation
2. Water conservation
3. Efforts for carbon neutrality
4. Hazardous and E-waste waste management
5. Health and Well- Being
6. Plantation
7. Carbon neutrality and Institutional footprint

University and its constituent college have undertaken various activities through N.S.S. and other activity to create eco-friendly awareness among the students, University and its constituent arranges special programs by inviting the eminent personalities, who in turn train and educate public. Students are encouraged to participate in eco-friendly activities.

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Green Auditing

The term “Green” means eco-friendly or not damaging the environment. This can acronymically be called as '**Global Readiness in Ensuring Ecological Neutrality**' (GREEN). 'Green Audit' can be defined as “systematic identification, quantification, recording, reporting and analysing of components of ecological diversity and expressing the same in financial or social terms”. 'Green Auditing', an umbrella term, is known by another name 'Environmental Auditing'. To implement the green audit other important aspects such as objective of green audit, drivers of green audit, future scope, benefits, and advantages are necessary to understand. The green audit practically involves energy conservation, use of renewable sources, rain water harvesting, and efforts of carbon neutrality, plantation, hazardous waste management & E-waste management. The concept of Green Audit, institutions are using it as a management tool to evaluate the environmental standards; institution can perform better and better for the sustainable development of the organization. The experiments on the nature by avoiding natural rules, this can be a one major reason behind that is Green Audit.



Adichunchanagiri University Campus.

Executive Summary

Colleges and Universities have broad impacts on the world around them, both negative and positive. The activities pursued by colleges can create a variety of adverse environmental impacts. But colleges are also in a unique position as educational institutions to be leaders in pursuing environmentally sustainable solutions. Adichunchanagiri University expresses its commitment to sustainability in many ways. It has taken a number of positive steps to reduce its environmental impact. But many areas remain in which substantial improvements can be made. This report serves to highlight BGS college's many accomplishments, and to make recommendations for improving the College's environmental sustainability. The college conducted the Green Audit in the year 2019 and strives to maintain eco-friendly atmosphere on the campus.

The initiatives taken by the college to make the campus Ecofriendly:

8. Energy conservation
9. Water conservation
10. Efforts for carbon neutrality
11. Hazardous waste management
12. E-waste management
13. Plantation

The college undertakes various activities through N.S.S. To create eco-friendly awareness among the students, college arranges special programs by inviting the eminent personalities, who in turn train and educate public. Students are encouraged to participate in eco-friendly activities.

Awareness of Carbon Consumption:

Students and Staff members are made totally aware of pollution that are caused by use of vehicles. The carbon consumption awareness program improves to help in carbon emission at individual as well as social level and avoids Air and Noise pollution in the campus due to vehicles or any activity in it. Green Audit is the most efficient & ecological way to solve such an environmental problem. The experiments on the nature by avoiding natural rules, this can be a one major reason behind Green audit process. Green Audit is one kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. It is necessary to conduct a green audit in college campus because student aware of the green audit, its advantages to save the planet & they become good citizen of our country. Thus Green Audit become necessary at the college level. Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties. Environmental auditing is used to Investigate, Understand and Identify.

I. Site Selection.

- Bengaluru – Hassan National Highway (NH-75), Nagamangala Taluk, Mandya District, B G Nagar, Karnataka 571448.
- It is positioned at 12°57'53.60"N 76°43'40.90"E and covers an area of 112158.249 square meters, it has an average elevation of 796 meters.
- Seismicity, it lies in the seismically stable region, Zone III.

i. Master Plan



ii. Building details

Building No.	Building Name
1.	Civil Engineering Block
2.	Civil Engineering Block
3.	Civil Engineering Block
4.	Guest House Block
5.	Staff Block

6.	Boys Hostel 1 Block
7.	Boys Hostel 2 Block
8.	Workshop Block
9.	Teaching Block
10.	CS EC Block
11.	ADMIN Block
12.	Polytechnic Block
13.	Canteen
14.	AIMS Hostel
15.	STP
16.	Play ground
17.	Mechanical Block

iii. Greenery in campus

University has retained some site features to minimize site damage and associated negative environmental impacts such as, greenery within the campus, thereby providing habitat and promoting biodiversity, top Soil Preservation is done to protect the top soil and control soil erosion, thereby reducing negative impacts to the site and surroundings, it has vegetated area of 22,468sq.m.



II. Built Environment.

i. Ambient Air Quality

Air pollution has long term and short term impact on the biotic and abiotic component of the environment. The ambient air quality at the core zone of Adichunchanagiri University was monitored. The study area represents it is very calm environment with less pollutants.

➤ Ambient Air Quality Monitoring Results:(Annex A)

Station Name	Description	Date of sampling
Near Main Gate	Sensitive zone	04.03.2019

Sr.no	SO ₂ (µg/m ³)		NO _x (µg/m ³)		PM ₁₀ (µg/m ³)		(CO) (µg/m ³)	
	Result	NAAQS	Result	NAAQS	Result	NAAQS	Result	NAAQS
1	4.5	≤80	8.0	≤80	51.01	≤100	BDL	≤4

National Ambient Air Quality Standards (NAAQS) BDL: Below Detection Limit



Respirable Dust Sampler.

ii. Day lighting

It is maintained that all regularly occupied spaces are daylit, thereby improving health and well-being of students & teachers.

Sr.no.	Space	Prescribed Illumination Level (Lux)	Readings
1	Classroom	150-300	167
2	Lab	150-300	310
3	Library	200-300	255
4	CAD Lab	300	254

Source: IS 8827- 1978- affirmed in 2006

Please note that the illumination level is monitored only for daylight. Before starting the monitoring process, the artificial lighting fixtures were switched off.



Lux reading

iii. Outdoor Light Pollution Reduction

To Reduce light pollution to increase night sky access and enhance the nocturnal environment. The institute has designed exterior lighting such that no external light fixture emits more than 5% of the total initial designed fixture Lumens, at an angle of 90 degrees or higher from nadir (straight down).

iv. Noise Environment

The noise levels measurements were carried out using precision noise level meter. The noise level survey was carried out at five locations, located within the in campus of Adichunchanagiri University the major source of noise identified in the study area has been predominantly the vehicular movement.

Sr.n	Name of Station	Noise Levels(dBA)	Ambient Noise Standard (dBA)	Category of area
0		Day	Day	
1	Library	44.5	50	
2	Classroom	47.7	50	Silent zone
3	Lab	48	50	
4	CAD Lab	46.7	50	



Noise reading

III. Water Audit.

Water audit is an effective management tool for minimizing losses, optimizing various uses and thus enabling considerable conservation of water, the efforts of the institution in water usage and management is seen through following activities it is satisfactory and no unnecessary water wastage is noticed in the campus.

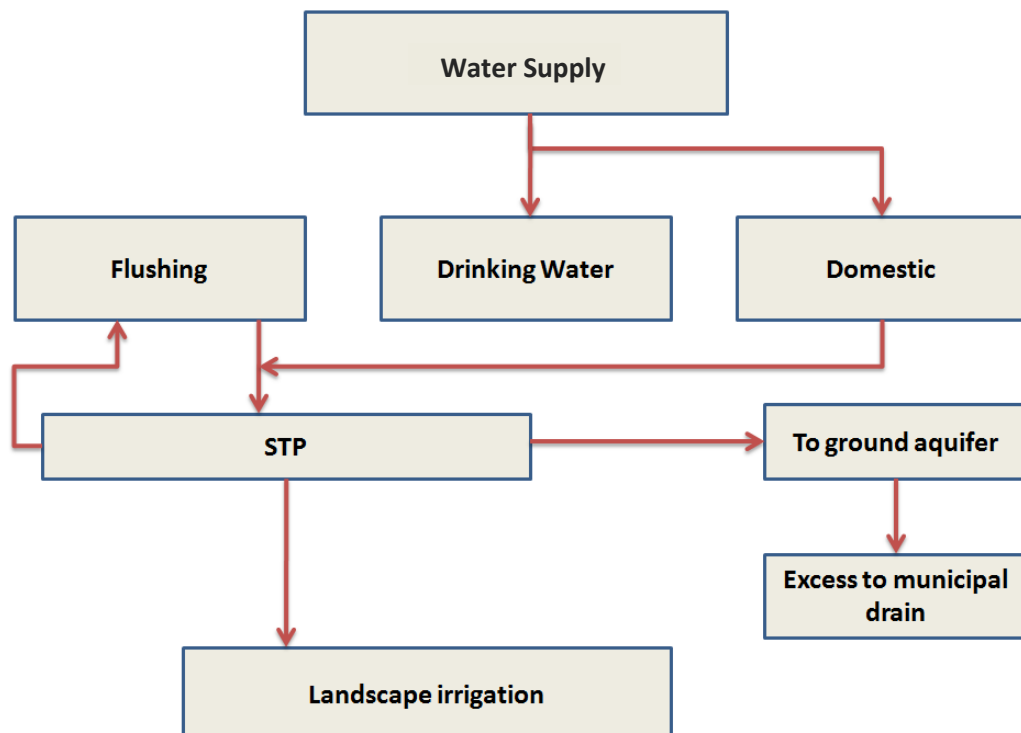
i. Water Supply and Usage

- Water source is bore water college has 5 bore well which satisfies the water demand. Currently water for the institution is sourced from nearby javaranahalli bore well.
- Water demand calculation based on WHO standard.

Year	Population	Demand @15 LPCD	Provision per 15% losses	Total demand
2018	1850	27,750	4162	31,912

Considering Lower limit of lpcd as per WHO is 15 lpcd

ii. Water Balance Chart



iii. Water quality

- The quality of Bore well water meets the potable water standards.
- The quality of waste water meets the prescribed values by State Pollution Control Board, as applicable.
- IS: 1500-2012 RO purified Drinking water is provided in each block.
- Institution has adopted UV and RO water filtration system to provide drinking water to the staff and students in each floor.

IV. Energy Audit.

The “Energy Audit” is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with their use, and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions. Energy audit is an effective tool in defining and pursuing a comprehensive energy management program within a business. As per the Energy Conservation Act, 2001, passed by the government of India, energy audit is defined as “the verification, monitoring and analysis of use of energy including submission of technical reports containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption.”

Objectives of Energy Auditing

The energy audit provides the 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 thermal and electrical energy economy.
- Highlighting wastages in major areas.
- Fixing of energy saving potential targets for individual cost centers.
- Implementation of measures for energy conservation & realization of savings.

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.

Power Supply System

Transformers

The power supply for the university is from Grid with the help of 11 KV feeders under Different Tariff Category. Sectioned load of the university is 200 KVA. University has a single transformer with Capacity 250 KVA. TAX invoice of the transformer is attached in Annexure -01.

DG Sets: -

The university has 03 Nos DG sets to supply Emergency power during the grid Power Failure. The Capacity of the DG sets is given below.

Sr. No	DG Location	Capacity of DG	Quantity
1	Main College	100	1
2	Boys Hostel	100	1
3	Girls Hostel	62.5	1

Observation

- ✚ DG set is used only in case of power failure.
- ✚ There is requirement of energy and fuel meters to monitor total unit generation with respect to fuel consumption

UPS System

University has installed -09 Nos UPS system for Instrument, Lab and Other Equipment's during the power failure . Details are given in the table.

Sr. No	Department	Capacity (KVA)	Quantity
1	Office	20	1
2	BOT Lab	30	2
3	CSE	20	2
4	CSE	10	2
5	ISE	20	2
6	ECE	20	2
7	MECH	20	1
8	CIVIL	5	1
9	IS	60	2

Capacitor Bank

University has installed 120 kVAr capacitor bank to maintain Power factor to the feeder. Its Appreciable.

Solar system:-

University has installed 200 KWp solar system for renewable energy in the campus.

Details of unit generation in given in table

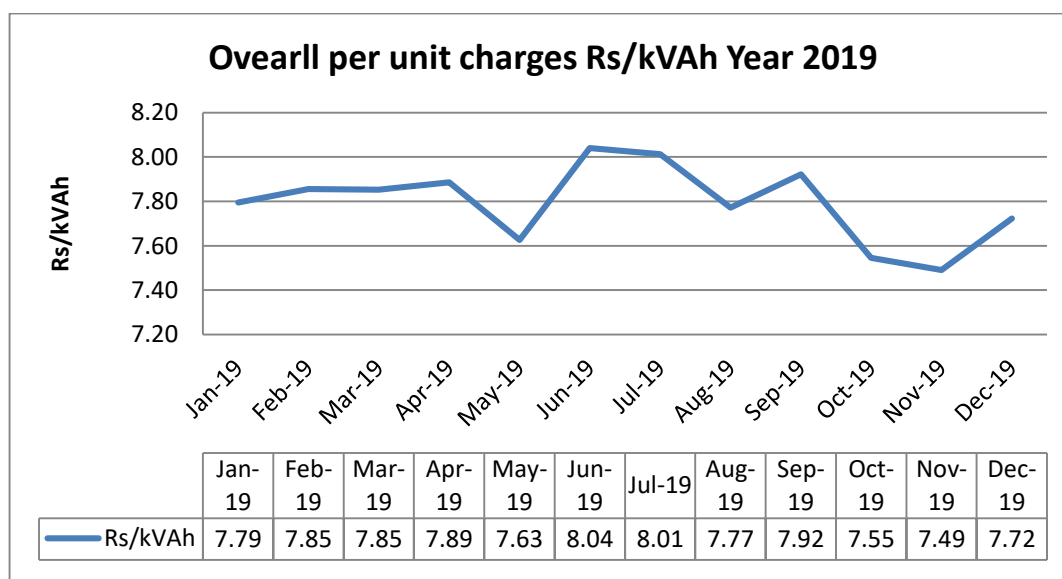


Energy Bill analysis

Electricity Bill Analysis: -

Energy audit team was analyzed Electricity bills of last one year. Details of unit consumption, annual average power factor and annual per unit charges are determined as follow:

Sr.No.	Month & Year	Unit consumption (kVAh)	Unit consumption (kWh)	Power Factor	Amount (Rs/-)	Rs/kVAh
1	Jan-19	39,220	36,930	0.942	3,05,712	7.79
2	Feb-19	47,950	46,570	0.971	3,76,639	7.85
3	Mar-19	60,920	59,830	0.982	4,78,387	7.85
4	Apr-19	59,610	58,560	0.982	4,70,071	7.89
5	May-19	65,350	64,290	0.984	4,98,354	7.63
6	Jun-19	56,030	55,020	0.982	4,50,461	8.04
7	Jul-19	42,326	37,470	0.885	3,39,116	8.01
8	Aug-19	44,610	40,410	0.906	3,46,675	7.77
9	Sep-19	47,850	45,290	0.946	3,79,089	7.92
10	Oct-19	45,500	40,570	0.892	3,43,301	7.55
11	Nov-19	42,610	36,880	0.866	3,19,176	7.49
12	Dec-19	46,890	43,510	0.928	3,62,112	7.72
	Total	5,98,866	5,65,330	0.939	46,69,093	7.79



Graphical Presentation of Overall per unit charges year-2019

Observation:

It was found that total energy consumption in the last 12 months was 5,98,866 units.

The average annual energy charges are Rs 7.79 /kVAh unit.

Average Power Factor of the university

Sr.No.	Month & Year	Power Factor
1	Jan-19	0.942
2	Feb-19	0.971
3	Mar-19	0.982
4	Apr-19	0.982
5	May-19	0.984
6	Jun-19	0.982
7	Jul-19	0.885
8	Aug-19	0.906
9	Sep-19	0.946
10	Oct-19	0.892
11	Nov-19	0.866
12	Dec-19	0.928
	Average	0.939

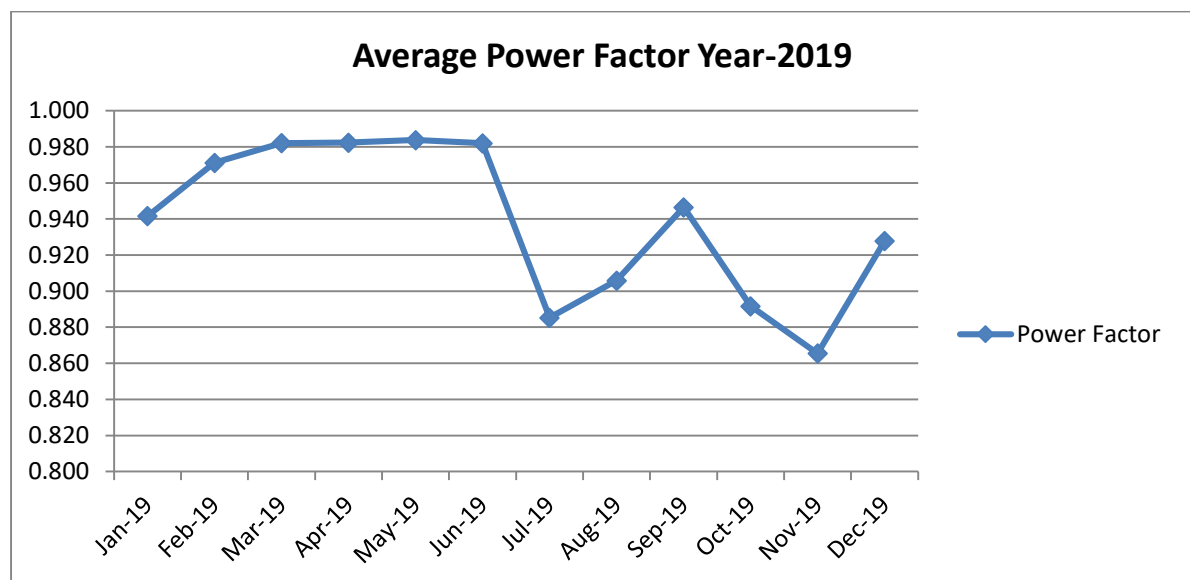


Figure :- Graphical presentation of average power factor of the university Year-2019

Observation:

- The average power factor was 0.939 for the year 2019. It is recommended to maintain power factor unity.

Connected Load System

HVAC system

University has installed Package chillier, Split AC, Window AC for cooling system in university. Details are given in below.

Sr. No	Types of Equipment's	Quantity	Capacity	Unit
1	Chillers/ Window /Split	56	346	TR
2	Split AC	47	70.5	TR
3	Exhaust Blower	2	20	kW

Electrical Motors in University.

University has installed various type of motor for different application. Details are given in the table.

Sr . No	Department	Capacity (HP)	Capacity (KW)	Quantity (Nos)	Total kW
1	Mechanical Department	1	0.746	15	11.19
2		10	7.46	1	7.46
3		5	3.73	1	3.73
4		1	0.746	9	6.714
5		0.5	0.373	1	0.373
6	Water Supply	5	3.73	1	3.73
7		3	2.238	3	6.714
8		2	1.492	2	2.984
9	Boys Hostel	3	2.238	4	8.952
10		2	1.492	3	4.476
11		1	0.746	3	2.238
12	Heat Pump	6	4.476	2	8.952
13	Fire Hydrant	5	3.73	1	3.73
14	Garden Water Pump	5	3.73	1	3.73
Total KW in Motors				47	74.973

Lighting system of university: -

University has installed different types of lighting system. Details are given in the table

Sr. No	Location	Rated Power (Watt)	Quantity	Total Power (kW)
1	Tube light	40	416	16.64
2	LED Light	20	9	0.18
3	LED Light	18	40	0.72
4	LED Light	9	11	0.099
Total Lighting load in kW				17.639

PART-02:- Adichunchanagiri Hospital & Research centre

Following building bills and data are considering in this part-02

- ✚ Adichunchanagiri Institute of medical Science
- ✚ Adichunchanagiri Hospital & Research Centre
- ✚ Adichunchanagiri College Nursing
- ✚ Adichunchanagiri College of Pharmacy

Power Supply System

Transformers Adichunchanagiri Hospital & Research Centre

The power supply for the Adichunchanagiri Hospital & Research Centre is from grid, with the help of 11 KV feeders under Different Tariff Category. Sectioned load of the university is 1250 kVA. University has 04 Nos transformer for Adichunchanagiri Hospital & Research Centre 02 Transformer is 1000 KVA and two other is 500 KVA.



DG Sets Transformers Adichunchanagiri Hospital & Research Centre

The university has 04 Nos DG sets to supply Emergency power during the grid Power Failure. The Capacity of the DG sets is given below.

Sr. No	Capacity of DG	Quantity
1	750	1
2	500	2
3	200	1

Observation

- ✚ DG set is used only in case of power failure.
- ✚ There is requirement of energy and fuel meters to monitor total unit generation with respect to fuel consumption

UPS System

University has installed 750 KVA UPS system for Instrument, Lab and Other Equipment's during the power failure for emergency power supply . **Its appreciable**

Capacitor Bank

University has installed three no's of capacitor bank to maintain Power factor to the feeder. Its Appreciable. Details are given in below .

- ✚ 350 kVAr = 02
- ✚ 250 kVAr =01

Solar system Adichunchanagiri Hospital & Research Centre

University has installed solar system for renewable energy in the campus .

Details of unit generation in given in table

Sl. No	Month & Year	Energy Consumption (kWh)	Solar Energy generated (kWh)
1	Jan-19	1,27,550	23,305
2	Feb-19	1,44,750	22,265
3	Mar-19	1,87,500	25,144
4	Apr-19	2,03,425	13,612
5	May-19	2,05,175	11,362
6	Jun-19	1,73,725	9,610
7	Jul-19	1,69,400	9,000
8	Aug-19	1,63,700	9,200
9	Sep-19	1,41,475	37,458
10	Oct-19	1,39,250	41,857
11	Nov-19	1,27,075	42,382
12	Dec-19	1,25,350	39,890
	Total	19,08,375	2,85,085

Observation: -

Total Solar unit generation is 2,85,085 units.

Energy Bill analysis

Electricity Bill Analysis Adichunchanagiri Hospital & Research:-

Energy audit team was analysed Electricity bills of last one year. Details of unit consumption, annual average power factor and annual per unit charges are determined as follow:

Sl. No	Month & Year	Energy Consumption (kWh)
1	Jan-19	1,27,550
2	Feb-19	1,44,750
3	Mar-19	1,87,500
4	Apr-19	2,03,425
5	May-19	2,05,175
6	Jun-19	1,73,725
7	Jul-19	1,69,400
8	Aug-19	1,63,700
9	Sep-19	1,41,475
10	Oct-19	1,39,250
11	Nov-19	1,27,075
12	Dec-19	1,25,350
	Total	19,08,375

Observation :- Total unit consumption is 19,08,375 units of year-2019

Connected Load System

4.2.1 HVAC system

University has installed following HVAC equipment's system for Hospital and research centre. Details are given in table .

Sr. No	Types of Equipment's	Quantity	Capacity	Unit
1	AHU	17	285.6	HP
2	FCUs Unit	47	800	HP
3	Packaged Acs	2	26.4	HP
4	Split Ac	50	120	HP
5	Exhaust Blower	55	275	HP
6	Fresh Air Blower	10	50	HP
7	Bore well	6	30	HP
	Total HVAC Load in HP		1597	

V. Health and Well-Being.

i. Campus design caters to differently able people

The institution has provided building design so that it caters to differently able people such as,

- Non-slippery ramps are provided.
- Lift 's is Provided
- Preferred parking for differently able.
- Wheel chair.

ii. Tobacco Smoke Control

The institution has taken care to eliminate exposure of students & teachers to tobacco smoke thereby reducing health impacts caused due to passive smoking.

iii. Basic Amenities

Institution has Provide access to basic amenities, so as to reduce negative impacts caused from automobile use and also make it easy for students, basic amenities such as bank, cafeteria, canteen, bus stop in front of the college, railway station within 1.5km and several other basic amenities, within a walking distance of 1 km from the building.

VI. Waste Management Audit

- The waste management is in order with the installation of dust bins. The waste is segregated at source by providing separate dust bins for Biodegradable and Plastic waste.
- Daily cleaning is carried out and most of the non-biodegradable waste is lifted by the City Municipal service.
- Various types of chemical waste are collected and disposed by the Department of Chemistry.
- The E-waste and defective item from computer lab is being stored properly. The institution has decided to contact approved E- waste management and Disposal facility in order to dispose E-waste in scientific manner.
- Hazardous Waste, Radioactive Waste not found.
- Institution has designed a sewage treatment plant and will treat waste water to tertiary standards, so as not to pollute the water streams, Sewage treatment plant is provided for 750 KLD capacity of Sewage Treatment Plant advanced technology of MBBR wastewater treatment plant.

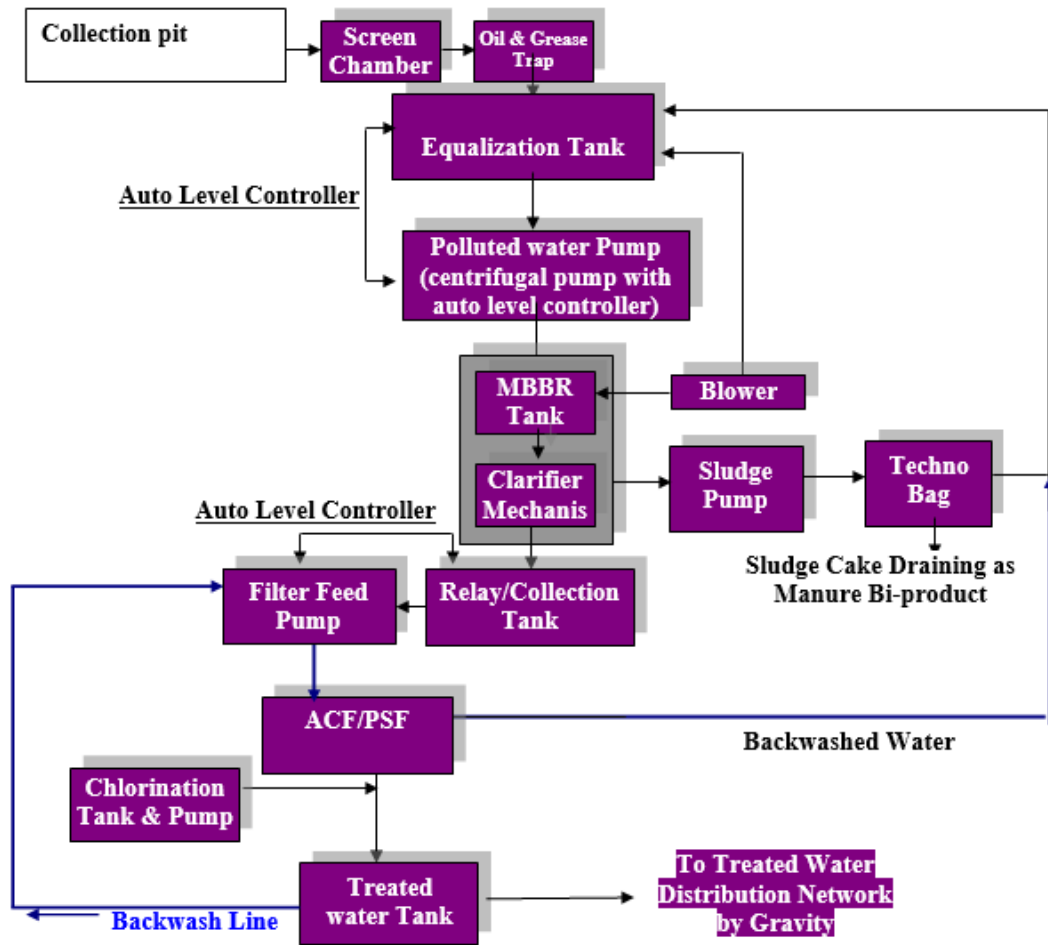


MBBR unit in Sewage Treatment Plant.



Screening unit in Sewage Treatment Plant.

GENERIC FLOW CHART: MBBR BASED DOMESTIC POLLUTED WATER POLLUTION CONTROL EQUIPMENT AND SYSTEM



Hydraulic Flow Drawing for 750kld Sewage Treatment Plant.

Characteristics of Raw Sewage Water

Sl No	Description	Raw Water	Treated Water
1.	Design Capacity	750 KLD	750 KLD
2.	Average Feed Flow	18KL	18KL
3.	Peak/Max. Feed Flow	50KL	50KL
4.	Operating Hours	24 Hours	24 Hours
5.	PH	6.5 – 8.5	6.5 – 8.5
6.	BOD	250 – 400 mg/l	< 20 mg/l
7.	COD	400 – 600 mg/l	< 100 mg/l
8.	TSS	150 – 250 mg/l	< 50 mg/l
9.	Oil & Grease	30 – 80 mg/l	<10

VII. Biodiversity Audit.

- A scientific survey of flora and fauna of the campus is carried out covering rainy, winter and summer seasons during 2018-19.
- This biodiversity audit has revealed more than 626 trees as follows,

Sr.no	SCIENTIFIC NAME	LOCAL NAME	No's
1.	Grevillea robusta	Silver oak	1
2.	Millettia pinnata	Honge	56
3.	Saraca asoca	Ashoka tree	58
4.	Artocarpus Heterophyllus	Jack fruit	08
5.	Rose wood	Beetae	25
6.	Peepal(bodhi)	Arali	02
7.	Phyllanthus	Nelli	22
8.	Mangifera indica	Mango	23
9.	Azadirachta indica	Bevu	176
10.	Melia dubia	Hebevu	20
11.	Swieteniamacrophylla	Mahogany	10
12.	Rubiaceae	Tega	179
13.	Magnolia Champaca	Sampige	16
14.	Citrus x sinensis	Ketale	04
15.	Indian almond	Kadu badami	8
16.	Mulberry	Neralae	13
17.	Ficus drupacea	Goni mara	2
18.	Santalum album	Sandalwood	3

- Various species of Mammals, Aves, Arthropods and Annelids were also recorded. This indicated excellent composition of Flora and Fauna quite unique considering that the campus is situated in the heart of the city. Many birds are reported to breed in the campus seasonally.
- Animals and Birds most observed are as follows:

Sl.no	Scientific Name	Local Name
1.	<i>Leptocoma zeylonica</i>	Purple rumped sunbird
2.	<i>Nectarinia asiatica</i>	Purple sunbird
3.	<i>Parus cinereus</i>	Grey tit
4.	<i>Accipiter badius</i>	Shikra
5.	<i>Bubulcus ibis</i>	Cattle egret
6.	<i>Saxicoloides Fulicata</i>	Indian robin
7.	<i>Dicrurus macrocercus</i>	Black drongo
8.	<i>Pycnonotus jocosus</i>	Red whiskered bulbul
9.	<i>Merops orientalis</i>	Small green bee eater
10.	<i>Terpsiphone</i>	Paradise fly catcher
11.	<i>Ardeola Grayii</i>	Pond heron
12.	<i>Milvus migrans</i>	Black kite
13.	<i>Funambulus palmarum</i>	Squirrel
14.	<i>Euploea core</i>	Butterfly
15.	<i>Acridotheres tristis</i>	Common myna
16.	<i>Columba livia</i>	Rock pigeon
17.	<i>Strix occidentalis</i>	Spotted owlet
18.	<i>Haliastur indus</i>	Brahminy kite
19.	Anisoptera	Dragon flies
20.	<i>Tyto alba</i>	Barn owl
21.	<i>Prinia socialis</i>	Ashy prinia.
22.	Arachnothera	Spider hunter
23.	Psittaciformes	Green parrot
24.	Serpentes	Snake

VIII. Green Education.

- The institution organize many outreach and educational programmes in a year with the involvement of students to increase public awareness on environment sustainability and green features of the campus.
- The whole campus involved in the Swachh Bharat Abhiyan by creating awareness around the institution regarding clean India mission by keeping their campus and its premises clean all the staffs and students participated and made the mission successful.



- Every year Environmental Day, Earth Day and Water Day is celebrated in the institution. Plantation activities are taken up to bring awareness and to increase the green coverage area in and around the campus.



Conclusion.

1. Top Soil Preservation is done by vegetation control soil erosion, thereby reducing negative impacts to the site and surroundings, it has vegetated area of 22,468sq.m.
2. Institution has UV and RO water filtration system to provide safe drinking water.
3. 750 KLD capacity of Sewage Treatment Plant advanced technology of Moving Bed Bio Reactor wastewater treatment plant has been implemented. The institution uses treated wastewater for in-situ applications, to reduce dependence on potable water
4. The institute has encouraged use of Renewable Technologies for On-Site Power generation, to minimize environmental impacts Institution has come up with solar agreement with TATA Power Solar.
5. The institution organise many outreach and educational programmes in a year with the involvement of students to increase public awareness on environment sustainability and green features of the campus.
6. The Institution is showing very less negative impact in vehicular activity regarding CO_{2e} emission.

Suggestion and Recommendation.

1. Rainwater harvesting storage tanks to be increased to collect complete volume of rainfall and with suitable treatment it can be reused foreseeing future needs of water. Further, rainwater pits can be prepared at appropriate places identified with the assistance of Department of Geology and restoration activities may be initiated to sustain the health of ponds and wetlands around the campus.
2. The wastes generated can be used for promoting organic farming activities within the campus and the products can be used in hostels and canteens, with a plan to ensure the availability of organic food in the canteen and hostels for future.
3. Give preference to the most energy efficient and environmentally sound appliances available.
4. Vehicle pooling should be promoted both among students and faculty and use of bicycles should be promoted.
5. Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
6. Green habitat concept should be adopted for all the building construction activities in future, which may help a long way in reducing energy usage, increasing aesthetic appeal of the buildings and class rooms, besides reducing carbon foot print.
7. Require that every staff and student member recognizes their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice conduct environmental awareness workshops as a part of program.



Built Environment Sustainability & Transformation