



"Solutioning" in the Consultation/Training/Auditing

## Certificate of Completion

This is to certify that

**Aarupadai Veedu Institute of Technology (AVIT)**  
**School of Arts and Science (SAS)**  
**School of Architecture and Planning (SAP)**

(Constituent College and Schools of Vinayaka Mission's Research Foundation)  
AVIT Campus, Rajiv Gandhi Salai (OMR) Palyanoor, Kancheepuram (Dt), Tamilnadu

has Successfully Completed

## Green Audit

*The study was completed by TULASI EOHS CONSULTANCY,  
CHENNAI*

**Dr. Vanisri Arunachalam**

**Er. C. Madhan Mohan**

### For TULASI EOHS CONSULTANCY SERVICES

Date :19-11-2020

Place : Chennai

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# VINAYAKA MISSION'S RESEARCH FOUNDATION

(Deemed to be University under section 3 of the UGC Act 1956)

## 7.1.6\_2. GREEN AUDIT

### B.AUDIT REPORTS





"Solutioning" in the Consultation/Training/Auditing

## GREEN AUDIT REPORT OF

Aarupadai Veedu Institute of Technology(AVIT),  
School of Arts and Science(SAP),  
School of Architecture and Planning(SAP)  
Kancheepuram



**AVIT**  
AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY



**SAS**  
SCHOOL OF ARTS AND SCIENCE



**SAP**  
SCHOOL OF ARCHITECTURE & PLANNING



Council of Architecture

AVIT Campus, Vinayaka Nagar, Old Mahabalipuram Road, Paiyanoor,  
Kancheepuram- 603 104, Tamil Nadu, India

**Submitted by**  
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VMRF -AVIT Campus- Green Audit Report, 2019~2020

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This is to certify that the following utilities were carried out Green audit in the month of October 2020.

**Details of Facilities Audited:** Main college building including: Laboratories, Libraries, Hospitals , All departments and Hostel and college Canteen.



**Dr. Vanisri Arunachalam**



**Er. C. Madhan Mohan**

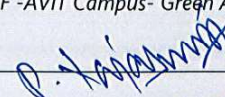
Authorized Signatory

**For TULASI EHS CONSULTANCY SERVICES**


Date : 26-10-2020

Place : Chennai

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## 1. INTRODUCTION

"The term 'Green' means eco-friendly or not damaging the environment. This can acronymically is called as 'Global Readiness in Ensuring Ecological Neutrality' (GREEN).

Green Audit is a process of Systematic identification, Quantification, Recording, Reporting and Analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings.

Educational institutions are becoming more sensitive nowadays to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the institutions to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc.,

Green audit is defined as an official examination of the effects, a college has on the environment. As a part of such practice, internal environmental audit (Green Audit) is conducted to evaluate the actual scenario at the campus.



## 2. OBJECTIVES

The Green Audit of an institution is self- assessment of the institution which reveals its role in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since beginning. The non-scholastic effort has not been documented. Hence, the purpose of the present green audit is to Identify, Quantify, Describe and Prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

To promote environmental aspects, the institute has initiated steps which includes

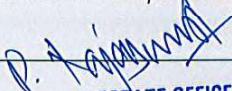
- a. Rainwater harvesting projects in campus
- b. To Complete ban on plastics within the campus,
- c. Solar water heating systems in all hostels,
- d. Treatment of wastewater and its recycling,
- e. Percentage of power requirement of the University met by the renewable energy sources, Solar panels for street lighting and Solar Energy is used for water heating,
- f. The academy should encourage the faculty and students to use cycles to save environment, prevent air pollution and promote healthy lifestyle.

## 3. METHODOLOGY

All the campuses of the Institution designed eco-friendly and landscaped with extensive gardens, Plantation with recycled water. The entire campuses are maintained as non-smoking zone. The significant initiatives implemented are:

- Energy Conservation
- Use of renewable energy through solar systems and windmill turbine unit.
- Rainwater Harvesting and Sewage Treatment and Recycling Plant

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- Carbon neutrality effort by tree plantation, Prevention of pollution, Reduction of paper usage and Plastic free zone.

An e-waste management policy and its implementations are coordinated by the Computer Science Department. Between the periods of 2011-2015, two Environment awareness programme conducted and both of these programs were funded by Ministry of Environment and Forests (MOEF) and one " Renewable energy Resources Mela" was conducted successfully for the Students and teachers from 15 schools in the districts of Chennai, Chengalpattu and Kancheepuram.

The purpose of the Green audit is to ensure the commitments mentioned in the Green policies are adhered. This includes:

- Inspection of the campus,
- Document Review
- Interview with Key personnel
- Measurements and recommendations.

#### 4. EXECUTIVE SUMMARY

SI No	Area	Observation	Remarks
1	Tree Plantation	<ul style="list-style-type: none"> <li>• Institution has carried out tree plantation activity.</li> <li>• Through Eco green club around 750 plants are planted with one student one tree campaign.</li> <li>• "G-50 park" created on the occasion of Chancellor birthday which consist 50 different trees.</li> </ul>	<ul style="list-style-type: none"> <li>• Students should plant a tree when they are studying Environmental Science subject</li> <li>• Planting a large number of trees in the campus is one of the regular features of NSS unit, which is doing the tree plantation drive along with eco green club.</li> </ul>
2	Energy conservation	<ul style="list-style-type: none"> <li>• The steps taken to reduce energy consumption is a great achievement Energy conservation by using energy efficient tube fittings and light sources like CFL and LED bulbs.</li> </ul>	Good support from the institution and Good initiative taken by college towards reduction of energy consumption.



		<ul style="list-style-type: none"> <li>• Every department non-teaching faculty is instructed to switch off lights, fans, electronic devices and AC's when they are not in use and stickers also pasted in all switch board and rooms.</li> <li>• All the faculty members and staffs are instructed to use minimal electricity</li> <li>• Smart Energy Management System implemented in one of the wing of Thiruvalluvar Block</li> </ul>	
3	Use of renewable and nonrenewable energy	<ul style="list-style-type: none"> <li>• 126 kW Grid connected solar power plant commissioned at the roof top of Thiruvalluvar block and its in fully operational.</li> <li>• Recycled water from hostels, college and hospital is used for gardens. (Sewage treatment plant) .</li> </ul>	<ul style="list-style-type: none"> <li>• Good initiative taken by college towards use of renewable energy.</li> <li>• The institution practices wastewater management system effectively to keep the campus clean, hygienic and free from any sort of pollution.</li> </ul>
4	Water harvesting	<p>Several types of water saving system adhered like</p> <ul style="list-style-type: none"> <li>• Rainwater harvesting system in all institutions.</li> <li>• Water source is from Sewage / Recycle Plants which are periodically maintained.</li> <li>• Maintenance of water pipelines.</li> </ul>	As a Contribution to environmental awareness / protection, Good initiative taken by college to make the campus eco-friendly.
5	Efforts for carbon neutrality	<ul style="list-style-type: none"> <li>• Tree Plantation, Ban of Two and Four Wheeler's within campus, Trap vehicular and fugitive dust emission.</li> </ul>	Good initiative taken by the institution towards prevention of pollution and make the institution a greenery one.
6	E-waste management	<ul style="list-style-type: none"> <li>• A technical team has been formed to take care of e-waste management.</li> </ul>	Initiative taken by the Institution to make the campus ecofriendly.



7	Effluent treatment and recycling plant	<ul style="list-style-type: none"> <li>The university has a water treatment plant in the campus and the recycled water is used for green campus.</li> <li>Biogas plant installed in the campus</li> </ul>	The institution practices wastewater management system effectively to keep the campus clean, hygienic and free from any sort of pollution.
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## KANCHEEPURAM 5. ABOUT THE VMRF (KANCHEEPURAM)

This campus includes three colleges named as below:

1. Aarupadai Veedu Institute of Technology (AVIT)
2. School of Architecture and Planning (SAP)
3. School of Arts and Science (SAS)

Aarupadai Veedu Institute of Technology (AVIT) was established in the year 1998 as an affiliated institution under the University of Madras. Later it was affiliated to Anna University, Chennai. In 2004, the institution attained the status of university under the ambit of **Vinayaka Mission's Research Foundation (VMRF) – Deemed to be University Salem under sec.3 of UGC act 1956.** AVIT is approved by **All India Council for Technical Education (AICTE) and Council of Architecture (COA), Govt of India.** The institution is located on Rajiv Gandhi Salai (Old Mahabalipuram Road) in a sprawling 24.11-acre land with a built-up area of 5.65 Lakh Sq.ft. The institution is committed to impart quality education to the students from different social-economic backgrounds. The institution offers under-graduate programs in ten different disciplines including B.Arch and seven post-graduate programs including Master of Business Administration (MBA) in Full-time (Regular) mode. The institute is also offering five undergraduate programs and six post graduate programs in Part-Time (Regular) mode. The campus has a Broadband Wi-Fi connectivity enabling the students to access **internet 24 X 7 with 200 Mbps bandwidth.**

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The institution is NAAC accredited. Major programs were accredited by National Board of Accreditation (NBA). **The University has introduced Structured Choice based Credit System(SCBCS) for all the programs and adopted Outcome based Education(OBE).The Institution has introduced Skill based learning, Research based learning in the Teaching and Learning process**

**School of architecture and planning (SAP)** is established in the year 2015, offering Bachelor of Architecture (5 years) program that aims to develop Multi-Dimensional capabilities in the student to meet the complex challenges that lie in conceptualizing ,formulating, designing and executing the built environments on Physical, Environmental and Technological parameters. The Pedagogy at School of Architecture and Planning (SAP) gains its strength from the Faculty, Studio, Built Environmental, Laboratory & Workshop, Library, Teaching Material and Inter- Institutional linkages.

The specialized core faculty of the School of Architecture and Planning (SAP) is well supported by the faculty team specialized in their domain areas of Knowledge. School of Architecture and Planning (SAP) is merely committed in meeting the challenge of Architectural demands through quality education and the qualified architects.

#### **School of Arts and Science**

**School of Arts & Science, (SAS)** was initiated in the year 2017 in AV Campus to provide multi-disciplinary education in arts & science to students from different socio-economic backgrounds and to pioneer research in these fields of study. SAS became an ambit institution of **Vinayaka Mission's Research Foundation (VMRF) in 2017.**

Keeping in line with the University's aim to make education a tool for social change for the betterment of society, SAS, with its dedicated faculty and innovative approach to teaching, learning and research has attracted talented students from across the country and around the world, nurturing them with a judicial mix of knowledge, information and



skills, molding them to face a competitive global system, truly, building individuals to build the world. The college is committed to impart such quality education in a conducive and well assigned environment and offers contemporary undergraduate and postgraduate full-time program.

Through strategic alliances in both the academic and corporate world, SAS stands committed to achieve excellence in education equipping the fresh graduates not only with domain knowledge, but also the necessary soft skills in communication, comprehension, analytical ability, team spirit and leadership, making them job ready. The fresh graduates are assisted in their pursuit for gainful and appropriate employment through job fairs and recruitment drives.

## 6. VISION & MISSION STATEMENT

NAME	VISION	MISSION
<b>AVIT</b>	<i>Aarupadai Veedu Institute of Technology is committed to the Vision of imparting Quality Technical Education focusing on the betterment of the Society, emphasizing on the ethical values.</i>	<i>To Create and Develop "Centers of Excellence" in Aarupadai Veedu Institute of Technology offering Engineering, Technology and Management Education providing opportunities for the rural students to enrich their knowledge to contribute to the Society, the Nation and the World.</i>
<b>SAP</b>	<i>Vision of School of Architecture and Planning is to excellence in Higher Education that continuously responds to the ever-changing Social realities through the development and application of knowledge, towards creating a People-centered, Ecologically Sustainable and Social Awareness that promotes Professional Ethics, Dignity, Equality, Social Justice and Code of Conduct for all..</i>	<i>Creation and provision of High-quality Professional Education and socially relevant in a wide range of Interdisciplinary areas of Architecture, Planning, Construction Technology, Sustainability, Urban Design to a large number of students from all sections of the society in the country</i>
<b>SAS</b>	<i>To provide excellent education with human values and social commitment</i>	<i>To develop knowledge citizens with multidisciplinary global competencies. To inculcate values of truth, fairness, tolerance</i>



& co-operation that lead students to serve the underprivileged.	& co-operation that lead students to serve the underprivileged.
To develop a sense of appreciation of traditional & cultural inheritance of the nation.	To develop a sense of appreciation of traditional & cultural inheritance of the nation.
To provide life skills for a successful career, home & society.	To provide life skills for a successful career, home & society.

## 6.1 Total Campus

Colleges	Built up Area in Sqm	Open space and plantation in Sqm	Categories of land use in Sqm
AVIT	61770.92	49980.00	97569.80
SAP			
SAS			

## 7. CAMPUS INFRASTRUCTURE

### Student hostel

**AVIT:** The Institution has hostel facility for boys and girls in individual blocks each with the capacity of 700 and 450 respectively. The hostel in mess caters to the requirement of all the inmates with both North Indian and South Indian food varieties in their regular menu. The institution has huge playground with Football, Volleyball, Cricket, Shuttle, Ball badminton, Kho-kho and Basketball courts. The indoor game facility and recreational facility are available both in the campus and in hostels. Well-equipped and state of art separate gymnasium for boys and girls is available in the hostel. An ambulance facility is also available round the clock. An ATM Center is established in the campus through ICICI Bank.

**SAP:** Hostels have been designed to provide a comfortable, safe, inclusive and secure living even as they provide opportunities to form lasting friendships and ease the transition from home to college. Residential staff is always available to



support the students from different backgrounds to promote community. Living on campus provides students with opportunities to:

- Connect with a diverse population
- Develop stronger interpersonal and communication skills
- Engage in campus leadership, organizations and activities
- Establish relationships with faculty and staff members

Hostel review committee meetings are conducted once in 15 days by the hostel administrators to address students' queries and requirements, and to keep them updated on up-gradation of services and events. Students are also given the privilege to give suggestions to improve the hostel facilities.

### Accommodation Details for Hostel

Hostel Name	Total Capacity	Remarks
Kalpna Chawla Girls Hostels	450	With attached bathrooms
Sir. C. V. Raman Boys Hostels	700	With common bathrooms in each floor
NRI Hostel (A/c)	75	With attached bathrooms
<b>Total</b>	<b>1225</b>	

- Indoor game facilities in the boys and Girls hostels.
- Well Equipped Gymnasia both in boys & Girls Hostel.
- Television facility in every floor of the hostel block.



## OTHER FACILITIES


- Common room for boys and girls separately.
- Canteen facility for the day's scholar.
- A Departmental store Carter's to the requirements of the students & staff.
- Vehicle Parking Facility.
- General Stores.
- A Laundry unit is available within the campus.
- ATM facility through ICICI bank.
- Both hostels are well connected with Wi-Fi facilities.
- Green environment encompasses the Hostel.
- Air conditioner rooms are available on request.
- Transport facility to college ply from various parts of the city.
- Potable water through RO Plant.
- AC (Air-Conditioned) and Non-AC single and shared bed options in SAHS
- Rooms equipped with ergonomically designed furniture
- First aid center, pharmacy, food kiosks, gymnasium, sport amenities, Wi-Fi service, and visitor rooms.
- Wardens, Supervisors, maintenance staff and security guards available 24x7.
- Security guard avail to govern and safe transit students to and from the campus to the nearest railway station and bus stops for late night / early hours of the day.

## 24 X 7 FACILITIES

- Electricity is provided with EB and three Generators.
- CCTV's are available.
- Security guards are available.

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- Residential Gent's and Ladies warden, student councilors are available.
- Residential Yoga instructor to keep mind and body fit available.
- 24 hours water supply and power supply supported by stand-by captive generators.

**7.1 Mess/ Canteen facilities** - A clean and hygienic mess for everyone, with all kind of food for all. Separate mess for girls and boys.

**7.2 Dining Hall-** Separate dining facilities for girls and boys are available with the provision of hot, normal and cold water. Separate North and South Menus are provided, Students from abroad can also choose from a limited list of special food items. For those who want to try out different cuisines, a variety of hygienic food facilities are available on campus. Fast food outlets are also attached to Hostels.

**7.3 Food-**Healthy, wholesome food and a variety of dining options are available for the hostel students. Given the great diversity of tastes and cultures, students have access to multi-cuisine catering services that serves vegetarian, non-vegetarian and International food. A balanced menu is prepared every month by the student mess and Menu committee in consultation with the hostel administration.

**7.4 Visitors Room-** Has spacious visitors' room and considering the need for privacy when hostellers meet their family. To spend their valuable time, have separate rooms for visitors both in Ladies and Gents Hostel for them

**7.5 SPORTS & FITNESS CENTER** - Indoor and outdoor sports facilities are available for Men& Women.

Gymnasia have 12-station multigym facility. The gym is spacious and well equipped with modern imported equipment. It has centralized air-conditioning and audio and video facilities. Qualified gym instructors are available round-



the-clock to train students specifically for their respective sports. This gym has separate timings for men and women.

- Health care center –gymnasia for boys and girls in the hostel
- Full time doctors and Nurses in the campus
- 24 hours ambulance facility in the hostel (2 Ambulances)
- Qualified Gym trainers for both boys and Girls Hostel
- Qualified Yoga Teachers for teaching Yoga in the Morning & Evening.

**7.6 CONFERENCE HALL** - The campus has spacious Conference Hall & Digital Classroom which include facilities like

- Internet connectivity
- Audio visual aids
- Public address systems.

**7.7 LIBRARY** - The Central Library is the knowledge hub of the college and disseminates knowledge wide and deep. The central library serves the following objectives

- Ensure optimum utilization of the resources available in the library.
- Ensure easy access to the facilities available to all the staff and students.
- Encourage and foster a reading habit among the staff and students.
- Helps the staff and students participate effectively in the teaching-learning programs of the college.
- Serves as the center of information for the college and provides easy access to national and global know how to all the staff and students.
- Improves collection and services on a continuous basis in consultation with the users/ stakeholders.
- Provides appropriate and comfortable ambience for the library users.



The Central Library is the heart, mind and soul of the institution. It is also the nerve center of the college and the fountain head of innovation, inspiration and insight both for the students and the faculty.

### **Working Hours**

Central Library will be Working on all Sundays from 9.00AM to 4.00PM in addition to Existing Library Working Hours.

**On Working Days- 8:00 AM to 8:00 PM**

**SATURDAYS- 9:00 AM to 4:00 PM**

**SUNDAYS- 9:00 AM to 4:00 PM.**

**7.8 BANKING FACILITY** - The Institution have an ICICI Bank ATM at Campus. This 24 hours ATM facility helps all the Students and Faculty to do a safe transaction whenever its needed.

**7.9 TRANSPORT FACILITY** - The campus is well connected by public transport system. The college can be reached in an hour's drive from Adyar, Chennai city. The institution also operates fleet of Buses covering key locations in and around Chennai, to facilitate the students and staff community.

**7.10 INTERNET** - The institute has dedicated Internet Leased line which is accessed from anywhere in the campus which helps the student in their academics

- 200 Mbps premium internet bandwidth with 1:1 connectivity
- Wi - Fi enabled campus

**7.11 NSS** -The NSS provides the youth, during this interregnum, avenues for indulging in creative and constructive work suited to their educational background and aptitude.

**NSS Moto:** "Not Me, But you"

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**7.12 Events-** Diverse events are periodically organised within the hostels to help the residents unwind, network, exhibit their talents and volunteer with the communities they live and study

To name a few:

- Yearly Hostel day celebrations
- Sports
- Cultural events
- Competitive events etc. are made available for residents to have a memorable hostel life.

## 8. GREEN AUDITING

### 8.1 Benefits of green auditing

- To safeguard the environment and natural resources used in the institution.
- Address current or potential future problems that may arise during the course of action.
- To provide basis for improved sustainability.
- To create a green campus.
- To enable waste management through reduction of waste Generation, solid- waste and water recycling.
- To create plastic free campus and evolve health consciousness among the stakeholders.
- Providing an opportunity for management to give credit for good environmental performance.
- Empower the organizations to frame a better environmental performance.



- Impart environmental education through systematic environmental Management approach and improving environmental standards.
- Benchmarking for environmental protection initiatives.
- Financial savings through a reduction in resource use.
- Development of ownership, personal and social responsibility for the College and its environment.
- Enhancement of college profile.
- Developing an environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management & monitoring of environmental and sustainable development programs of the college.

## 8.2 Target areas of green auditing

Basically, Green Audit involves the inspection to assess the total environmental impact of its activities. It indicates what type of carbon footprints organizations are leaving on the planet & also suggest ways to reduce it.

Accordingly, Green Audit mainly emphasizes the following key areas:

1. Energy Conservation
2. Saving Water
3. Greening the workplace
  - a. Efforts of carbon neutrality
  - b. Plantation – Botanical or Medical Significance
  - c. Non-conventional Energy sources-solar panels
4. Waste Management
  - a. Bio- Hazardous
  - b. E-Waste
  - c. Other wastes



## 5. Effluent Treatment and Recycling plant

### 8.3 Methodology of Green Auditing

#### 8.3.1 Data Collection

#### 8.3.2 Data Analysis

#### 8.3.3 Observation

#### 8.3.4 Recommendation

#### 8.3.5 Review of Documents and Records

##### 8.3.1.1 Data collection

In preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements.

Following steps were taken for data collection:

- The team went to each Block, Hostels.
- Data about the general information was collected by observation and interview.
- The power consumption of appliances was recorded by taking an average value in some cases.

##### 8.3.1.2 GEOGRAPHICAL LOCATION WITH CAMPUS MAP IN SCALE

Colleges	Built up Area in Sqm	Open space and plantation in Sqm	Categories of land use in Sqm
AVIT	61770.92	49980.00	97569.80
SAP			
SAS			

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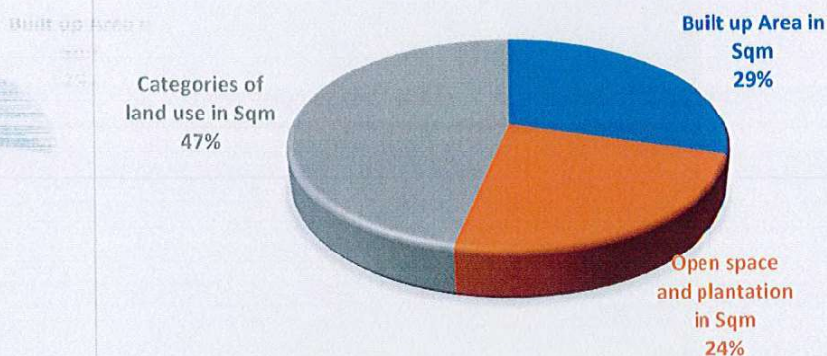
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## GEOGRAPHICAL LOCATION WITH CAMPUS MAIN SCALE

### GEOGRAPHICAL LOCATION WITH CAMPUS MAP IN SCALE

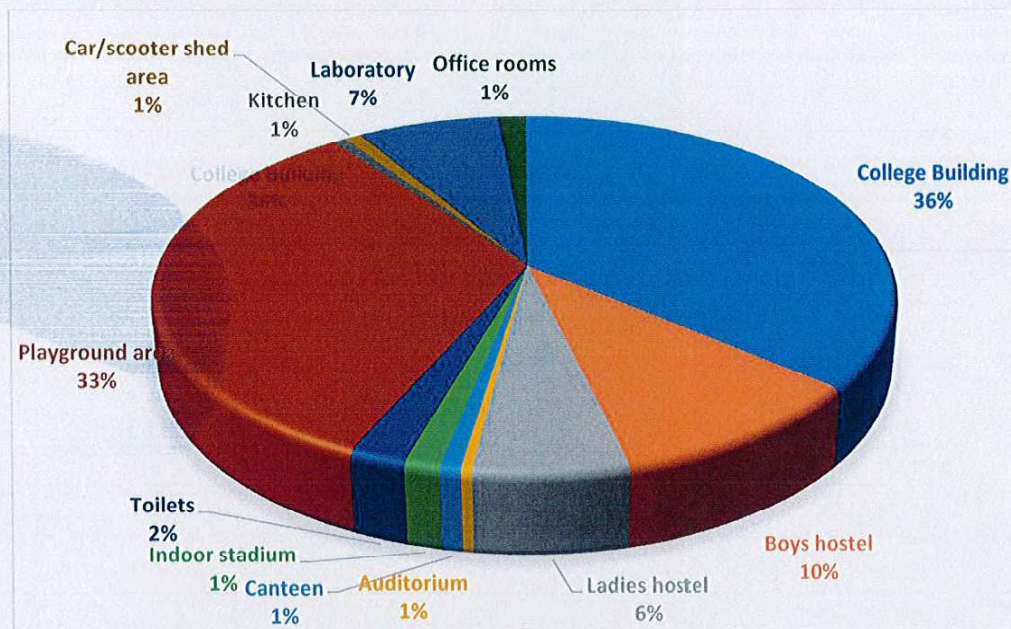


### 8.3.1.3 CATEGORIES OF LAND USE (BUILT UP AREA)

DESCRIPTION	AREA IN Sqm
	AVIT ,SAP & SAS
College Building	33154.81
Boys hostel	9384.85
Ladies hostel	5324.55
Auditorium	370.80
Canteen	722.26
Indoor stadium	1244.20
Toilets	1971.00
Playground area	30446.09
Kitchen	632.00
Car/scooter shed area	794.27
Laboratory	6598.34
Office rooms	1248.00
<b>TOTAL</b>	<b>91891.17</b>



## USE (BUILT UP) CATEGORIES OF LAND USE (BUILT UP AREA)



### 8.3.1.4 FLORA & FAUNA (AVIT, SAP & SAS)

DESCRIPTION- FLORA	QTY
Tamarind Trees	10
Avenue Trees	500
Neem Trees	100
Jack Fruit Trees	0
Mango Trees	3
Coconut Trees	0
Jamoon Trees	50
Amla trees	5
Singapore Cherry Trees	50
Champak Trees	10

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 Vinayaka Mission's Research Foundation  
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 Ariyanoor, Salem - 636 308. Tamilnadu.

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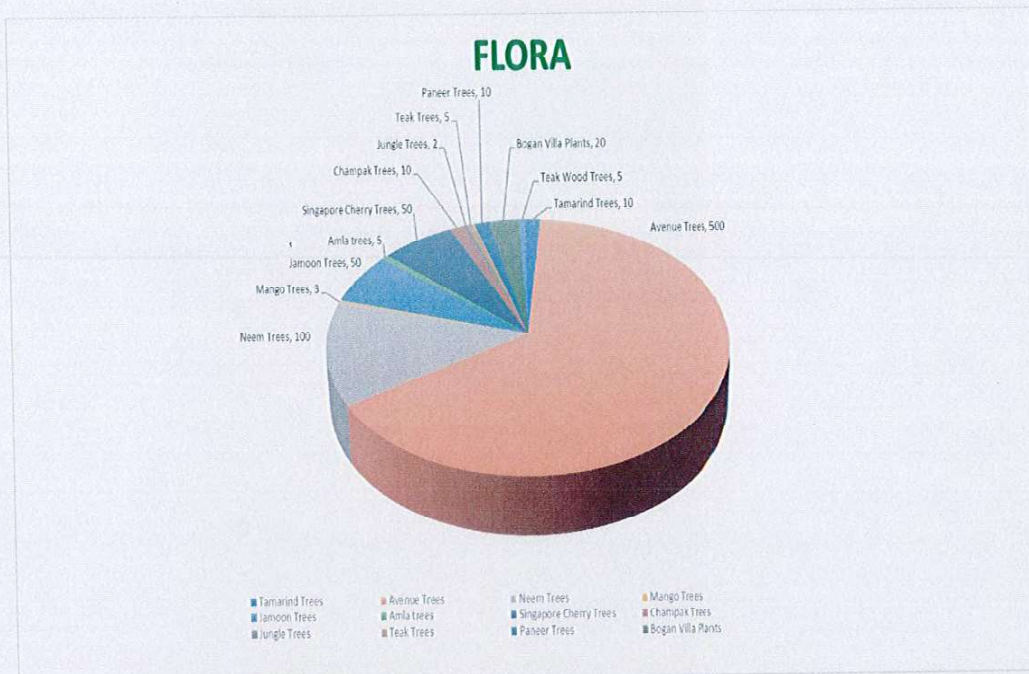


Jungle Trees	2
Teak Trees	5
Paneer Trees	10
Bogan Villa Plants	20
Teak Wood Trees	5
<b>Total</b>	<b>770</b>
<b>DESCRIPTION- FAUNA</b>	<b>Zoological name</b>
SPIDERS	<b>Araneae</b>
Reptiles	Reptilia
Birds	Aves
Mammals	Mammalia

SI No	Tree Names	15-16	16-17	17-18	18-19	19-20
1	Tamarind Trees	10	0	0	0	0
2	Avenu Trees	420	50	30	0	0
3	Neem Trees	80	10	10	0	0
4	Jack Fruit Trees	0	0	0	0	0
5	Mango Trees	3	0	0	0	0
6	Coconut Trees	0	0	0	0	0
7	Jamoon Trees	45	0	5	0	0
8	Amla Trees	0	2	2	0	1
9	Singapore Cherry Trees	20	10	10	0	10
10	Champak Trees	2	1	3	0	4
11	Jungle Trees	2	0	0	0	0
12	Teak Trees	5	0	0	0	0
13	Panner Trees	5	4	0	1	0



14	Bogan Villa Plants	17	1	1	0	1
15	Teak Wood Trees	4	0	1	0	0
TOTAL		613	78	62	01	16

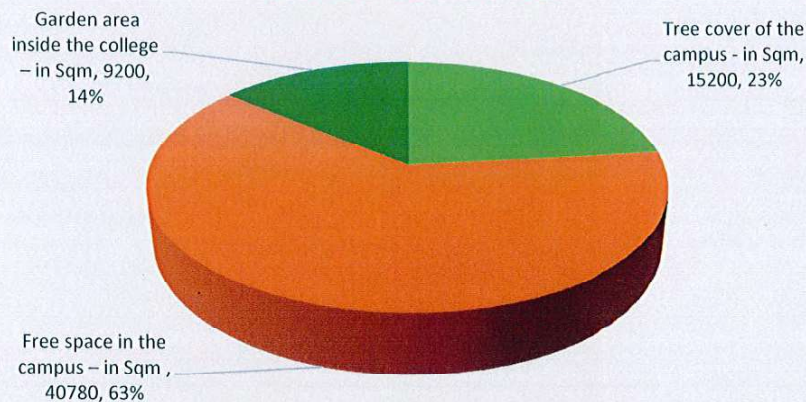


### 8.3.1.5 Green Campus

Tree cover of the campus - in Sqm	15200.00
Free space in the campus – in Sqm	40780.00
Garden area inside the college – in Sqm	9200.00



## GREEN CAMPUS



### 8.3.2 DATA ANALYSIS

Detailed analysis of data collected including calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the Tamilnadu State Electricity Board Data related to water usages were also analyzed using appropriate methodology.

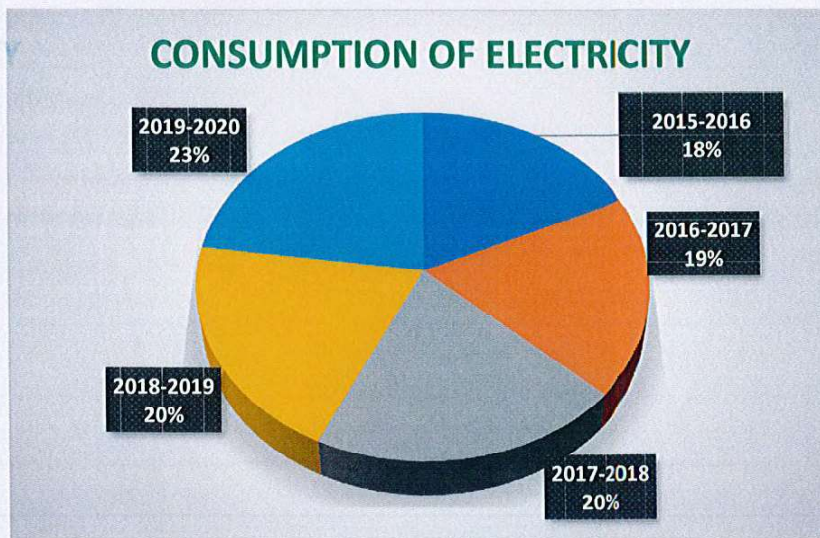
#### 8.3.2.1 Electricity

Consumption of Electricity per year in kW-hr

YEAR	AVIT,SAS & SAP
2015-2016	632260
2016-2017	656133
2017-2018	711236
2018-2019	705675
2019-2020	798798
Total 5 Yrs.	3504102



## CONSUMPTION OF ELECTRICITY

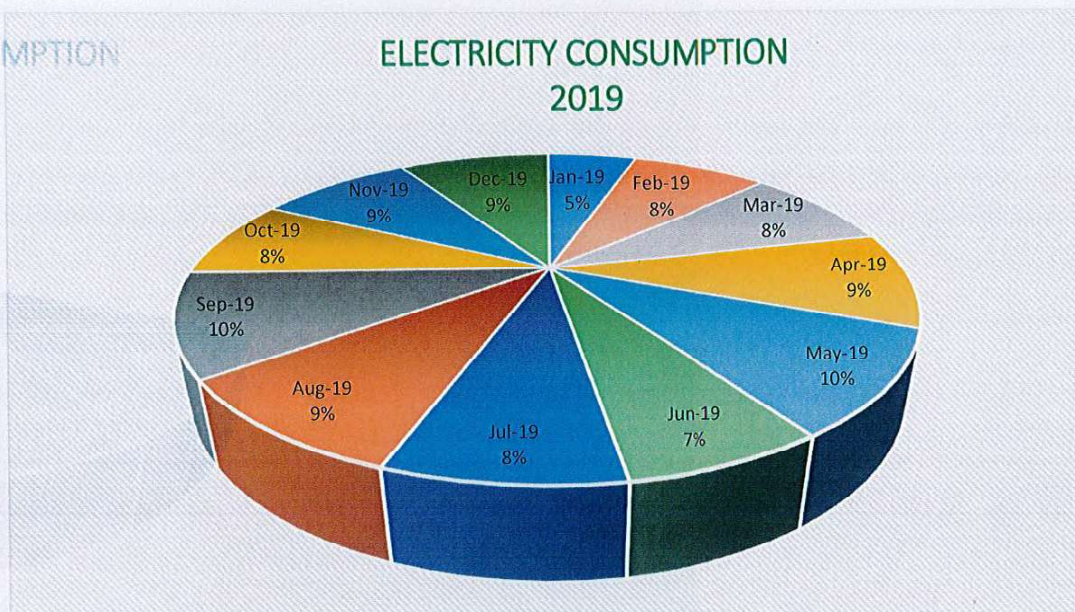


### Electrical Power Consumption for the year of 2019 . HT Installations

YEAR	AVIT, SAS & SAP
Jan-19	40100
Feb-19	63431
Mar-19	67214
Apr-19	74551
May-19	76830
Jun-19	53605
Jul-19	61722
Aug-19	71968
Sep-19	78830
Oct-19	63145
Nov-19	68331
Dec-19	68922
<b>Total</b>	<b>788649</b>



## ELECTRICITY CONSUMPTION 2019



Details of Electrical Equipment & Generators( AVIT, SAP & SAS)	Qty.
200 KVA Transformer	1
320 KVA Transformer	1
500 KVA Transformer	1

### 8.3.2.2 REPORTS

#### • AIR QUALITY REPORT

Date	Station	City	State	AQI	Air Quality Index
20-Jul-2020	Payanoor	Chennai	Tamil Nadu	AQI	46

VMRF -AVIT Campus- Green Audit Report, 2019~2020

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ESTATE OFFICER  
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Pollutants	Duration	concentration in $\mu\text{g}/\text{m}^3$ (except for CO)
PM10	24-hr avg	18.00
PM2.5	24-hr avg	11.00
SO2	24-hr avg	16.00
NOx	24-hr avg	13.00
*CO (mg/m3)	max 8-hr	234.00
O3	max 8-hr	42.00
NH3	24-hr avg	23.00

\* Concentrations of minimum three pollutants are required; one of them should be PM10 or PM2.5

<b>Good</b> (0-50)	Minimal Impact	<b>Poor</b> (201-300)	Breathing discomfort to people on prolonged exposure
<b>Satisfactory</b> (51-100)	Minor breathing discomfort to sensitive people	<b>Very Poor</b> (301-400)	Respiratory illness to the people on prolonged exposure
<b>Moderate</b> (101-200)	Breathing discomfort to the people with lung, heart disease, children and older adults	<b>Severe</b> (>401)	Respiratory effects even on healthy people

#### • WATER QUALITY REPORT

WATER QUALITY REPORT		
Parameter/ WHO Permissible Level	Observed Value	Method
	<b>Under Permissible</b>	<b>Protocol IS - 3025</b>

VMRF -AVIT Campus- Green Audit Report, 2019~2020

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		Limit		
Water Quality Report as Follows				
Sample Nature/Name: Borewell water				
Description:- Colourless, Odourless, Transparent liquid.				
TESTS	RESULTS	Maximum Acceptable Limits (In Mg/l)	Maximum Permissible Limits (In Mg/1)	Protocol
				IS-3025
		(As per IS 10500:2012)		
Colour, Hazen Units	Colourless	5	15	Part 4
Odour	Odourless	Agreeable	Agreeable	Part 5
Turbidity, NTU	-	1	5	Part 10
pH Value	7	6.5 - 8.5	No Relaxation	Part 11
Total Hardness as CaCO <sub>3</sub> , mg/1	115	200	600	Part 21
Calcium as Ca, mg/1	-	75	200	Part 40
Magnesium, as Mg, mg/1	-	30	100	Part 46
Chloride as Cl, mg/1	30.6	250	1000	Part 32
Total Dissolved solids, mg/1	173	500	2000	Part 16
Sulphate as SO <sub>4</sub> , mg/1	-	200	400	Part 24
Nitrate as NO <sub>3</sub> , mg/1	-	45	No Relaxation	Part 34
Fluoride as F, mg/1	-	1	1.5	Part 60
Iron as Fe, mg/1	0.072	0.3	No Relaxation	Part 53
Chromium as Cr6+, mg/1	-	0.05	No Relaxation	Part 52
Copper as Cu, mg/1	-	0.05	1.5	Part 42
Manganese as Mn , mg/1	-	0.1	0.3	Part 59
Residual Free Chlorine, mg/l	-	0.2	1	Part 26
Total Alkalinity as "CaCO <sub>3</sub> , mg/1	150	200	600	Part 23
Aluminum, as Al, mg/1	-	0.03	0.2	Part 55
Boron as B, mg/1	-	0.5	1	Part 57

• **Noise report**

**Ambient air quality standards in respect of Noise**

Area	Limits in dB(A) Leq	
	Day time	Night Time
Entrance Porch	76	62



Inside Building	55	38
-----------------	----	----

### Level of disturbance near by the institution (Scale 1LOW to 9 HIGH)

Level of disturbance it creates for the college	Scale
Municipal dump yard	1
Garbage heap	1
Public convenience	5
Sewer line	1
Stagnant water	9
Open drainage	1
Industry – (Mention the type)	1
Bus / Railway station	1
Market / shopping complex / Public halls	1

### 8.3.2.3 ANALYSIS OF WASTE GENERATION AND DISPOSAL

Department/block	Solid waste in kg/day	Plastic dry waste /day	E-Waste in kg / day	Packing material in kg/day	Bio—medical waste	Organic wastes in kg /day	Paper waste in kg / day	General waste in kg /day	Bio-medical waste in kg /day	Garbage in kg/ day	Radio-active biohazard	Non-biodegradable	Waste Management practice	Mode of disposal	Remarks
Canteen	5	5	0	2	0	50	1	10	0	1	0	2		Manual	Biodegradable / Non-biodegradable
Library	1	0	0	0	0	0	5	0	0	0.5	0	0		Manual	Biodegradable / Non-biodegradable
Store	2	1	0	0.5	0	0	2	2	0	1	0	0.5		Manual	Biodegradable / Non-biodegradable
Office	1	2	0	0.5	0	0	1	1	0	1	0	0		Manual	Biodegradable / Non-biodegradable
Garden	2	2	0	0	0	1	1	50	0	1	0	1		Manual	Biodegradable



Auditorium	1	1	0	0	0	0	1	0	0	0.5	0	0		Manual	
Bathrooms	2	1	0	0.5	0	0	1	1	0	0.5	0	0.5		Manual	
Classrooms	10	5	0	2	0	1	10	2	0	2	0	2		Manual	
Lab	2	1	2	1	2	0	1	1	2	0.5	0	0.5		Manual	Biodegradable
Premises	10	5	0	5	0	10	3	10	0	2	0	2		Manual	

Note: Please tick (✓) in waste management practice

Total Biodegradable waste in kg/ day	100
Non-biodegradable waste in kg/ day	8.5
Hazardous wastes in kg/day	0.0

### ANALYSIS ON RECYCLING TREATED WATER

SL NO	CAPACITY in KLD	TREATED WATER USAGE	IS POLLUTANTS ARE REMOVED FROM THE TREATED WATER			REMARKS
			PHYSICAL	BIOLOGICAL	CHEMICAL	
1	600	400	yes	Yes	Yes	Treated water is used for gardening

### REQUIREMENT OF WATER PER DAY IN 2018

SL. No.	Buildings	Number of Occupants	Total Consumption	Actual Per Capita/day
1	Hospital, Hostel and Residential	540	91800	170

### REQUIREMENT OF WATER PER DAY IN 2019

SL. No.	Buildings	Number of Occupants	Total Consumption	Actual Per Capita/day
	Hostel and Residential	519	85635	165

### 8.3.3 Major Audit Observations

- Observed that college has promoted environmental aspects and initiated steps which includes in campus rainwater harvesting projects within the campus



- Practiced complete ban on plastics within the campus.
- Treatment of wastewater and its recycling as per regulations.
- Renewable energy sources like solar panels used for power generation.
- The future goal is to make the institution, a paperless organization.
- Hence the AVIT promotes the eco-friendly initiatives include energy conservation, use of solar / renewable energy, rainwater harvesting, sewage treatment plant, domestic waste and biomedical waste management and air pollution control.
- Electronic wastes are collected, and they are disposed to the agencies recommended by the Pollution Control Board.

#### 8.3.4 Recommendation

Based on results of data analysis and observations, some steps for reducing power, water consumption, greening the workplace, waste management and effluent treatment and recycling plant were recommended. Proper treatments for waste were also suggested. Use of fossil fuels must be reduced for the sake of community health

#### Target Areas of green auditing in Detail

**8.3.4.1 Energy Conservation** – This includes energy audit where the auditors identifies way to save electric, natural gas, and other forms of power that are inefficient or being wasted in the organization. This is done by recommending more efficient electric heating & cooling etc.



**The following are steps taken to ensure the energy conservation**

- Tungsten bulbs have been replaced with LED and CFL (compact fluorescent lights) which conserve energy.
- 17% LED and 8% CFL Lamp bulbs provided within the campuses.
- 250 sodium vapour lamps have been replaced by 90 and 55 watts CFL. In a phased manner all lights will be replaced by either for CFL or LED.
- All the Fans, Lights and Air conditioners are maintained in the switched off mode when not in use. The slogans insisting the necessity to switch off the Fans, Lights & AC's displayed above to all the switch boards in the campus.
- Smart Energy Management system have commissioned in left wing of Thiruvalluvar Block as a pilot project and successfully implemented.

**Recommendation**

- Light fittings are needed to be cleaned regularly to ensure optimal lighting.
- Windowpanes are to be cleaned regularly to allow in more day light.
- All air conditioners are with local control and are used only when necessary. They are needed to set at comfortable 25 degrees.
- All computers, printers, photocopiers and other equipment are have to be switched off at the end of the day.
- Standby settings on LCD projectors, printers and computers are to be avoided.
- No of Energy efficient ceiling fans must be increased to conserve more power.
- Ensure Fridges are not placed next to heat sources.
- Solar street lighting inside the campus.



SL NO	CATEGORIES	QTY	POWER CONSUMPTION in units per annum
1	Energy Efficient LED Lights	500 No's	21600 kW-hr
2	Capacitor Bank of different capacities	2 No's (100 KVR + 150 KVR)	0.96
3	Energy Efficient Ceiling Fans	NA	NA
4	VRF Air Conditioners	2 No's (12 ton + 21 ton)	52000 kW-hr

**8.3.4.2 Saving water-** This involves educating the employees on ways to save, recycle & reuse precious water resources both inside & outside the premises. The basic emphasis should be to reduce water consumption.

**Steps taken to conserve water are as follows:**

Rainwater Harvesting System is installed to collect rainwater from roof top of the buildings and allow it to flow to the nearest open well.

**8.3.4.3 Greening the workplace**

This is achieved by the following activities of designing a greener office space like:

1. Efforts for carbon neutrality- Tree Plantation, Prevention of pollution through Ban of Two and Four Wheelers within campus, Reduction of paper usage , and ban on plastic to make the campus as plastic free zone, Campus waste water (100kLD) is treated in a treatment plant and treated water is used for gardening and hence equivalent carbon credit is achieved by this
2. Use of renewable energy sources
  - a. Solar Energy
3. Waste Management



- a. E-Waste
- b. Bio and non-biodegradable
- c. Other wastes

#### 4. Water recycling

In one year, a single mature tree will absorb up to 48 pounds of Carbon-Dioxide from the atmosphere and releases its oxygen. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people.

#### a. Efforts of carbon Neutrality

##### Current Practice

- o Tree Plantation, Ban of Two and Four-Wheeler is within campus, Campus wastewater (100kLD) is treated in a treatment plant and treated water is used for gardening and hence equivalent carbon credit is achieved by this.
- o 750 saplings were planted inside the campus and sustain it more.
- o Through NSS and UBA, College has adopted 5 villages, where the tree plantation activities are carried out.

##### Recommendation

- Restricted entry for vehicles to the campus to keep the campus pollution free.
- Recommended to use bi-cycle and e-mopeds to students.
- Buses shall be fitted with pollution free stickers (emission test to be done).
- The staff is also encouraged to use carpool to reduce consumption of fuel, pollution and reduce carbon footprint.
- The university vehicles are to be checked by the RTO and provided with (CNG) pollution-free stickers.
- Recommend to plant large number of trees in the campus.



- Recommend to the institution to launch a drive to reduce the use of paper and paper usage must be replaced by soft copies like scanned copies and images and circulars are to be sent via e-mails and text messages.
- The future goal is to make the institution, a paperless organization.
- Recommend using Environment friendly jute bags to the delegates during the undergraduate conferences or any other occasions.
- Recommend making practice the campus as a Plastic Free Zone and disposable plastic goods are shall be used minimally.
- The use of polythene covers are not to encourage on campus instead everyone is encouraged to use paper bags / cloth bags.

## **b. Use of renewable Energy source**

### **• Solar Energy**

- 126 kWp solar power plants have been setup on the top of the main building. To that extent EB consumption has been reduced and hence nonrenewable energy consumption to generate 126 kW is reduced and also CO<sub>2</sub>, SO<sub>2</sub>, SPM emissions reduction have been achieved. Moreover, many solar energy related student projects have been undertaken in Thermal and Electrical Engineering programs.

#### **i. 100 KWP GRID CONNECTED ROOF TOP SOLAR POWER PLANT**

A 100 kWp Grid connected solar power plant is under installation on the left and right wing of the main building. The output of the plant is converted to AC using five string inverters of Refusol make of a capacity 20kW respectively are the inverters have a MPPT controller and the inverters itself have the mechanism to synchronizes the generated power to the local grid. It is estimated that it will generates around 600



Units per day. The plant was installed by M/S V.D. Swami and Company Ltd., Chennai.

## ii. 26 KWP GRID CONNECTED ROOF TOP SOLAR POWER PLANT

A 26 KWP Grid connected solar power plant is installed on the left wing of the main building. The output of the plant is converted to AC using two string inverters of delta make of a capacity of 11kW and 15kW respectively. The inverters have a MPPT controller and the inverters themselves have the mechanism to synchronize the generated power to the local grid. It generates around 130 Units per day. It was commissioned in December 2012. The plant was installed by M/S TATA Power Solar, Bangalore.

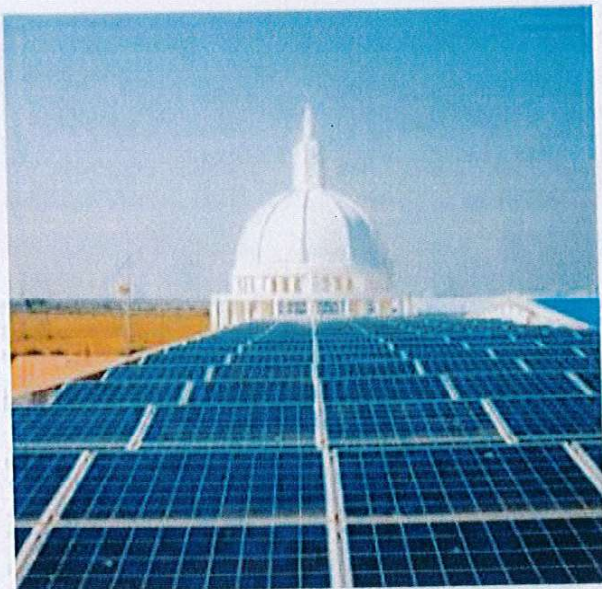
### The Institution has facilities for alternate sources of energy and Energy

#### Conservation Measure:

##### Solar Energy

Energy	Energy Generated Per Day kWhr	Energy conserved Per Year Considering 250 Days kWhr
100 kWp GRID CONNECTED ROOF TOP SOLAR POWER PLANT	600	150000
26 kWp GRID CONNECTED ROOF TOP SOLAR POWER PLANT	130	32500





The 126 KW power grid connected solar power plant commissioned in the campus

### c. Waste Management-

- **Hazardous waste-** No hazardous waste are created nor managed.

- **E-Waste**

- **Current Practice**

- i. A technical team has been formed to take care of e-waste management. This team consists of one expert from IT department and two environmental specialists
      - ii. The technical team visited ELCOT (Electronics Corporation of Tamil Nadu) and TNPCB (Tamil Nadu Pollution Control Board) in connection with e-waste



management. The guidelines prescribed by MOEF (Ministry of Environment and Forests) were collected. The details of authorized e-waste recyclers registered with TNPCB were also collected. As a result, 400 computers along with monitors, CPU, Keyboards, mouse and UPS were disposed off in an environment friendly manner to Government authorized agency as per E-Waste Management Rules 2016.

### **Recommendation**

- To inculcate environment awareness among the students and to urge them to recycle waste materials, they are encouraged to actively participate in competitions on 'Junk Art' - making art from waste etc.,
- ii. Green computing through implementation of energy-efficient central processing units (CPU's), servers and peripherals and all the equipment in the laboratories and departments are under Annual Maintenance Contract (AMC) to ensure their optimum functioning.
  - iii. Minor repairs are set right by the staff and the Laboratory.
  - iv. Assistants and the major repairs are to be undertaken by the professional technicians and the equipment is reused.
  - v. Separate e - waste bins are to be maintained in the campus.

- o **Bio and Non-biodegradable waste**

The institution has generated the below wastes from various department including canteen, Garden, Auditorium, Bathrooms and premises

- Total biodegradable waste is accumulated as 100 kg/day and Non-biodegradable waste in kg/day as 8.5 kg/day.

- o **Other wastes - Types of wastes and its disposal method**

- i. E-wastes. - Disposed with Government Authorized Agency.
- ii. Plastic wastes. - **Disposed with scrap vendors.**