

GREEN AUDIT REPORT

Of

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES

Sangivalasa, Visakhapatnam



By



TÜV INDIA PRIVATE LIMITED
TÜV NORD GROUP

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ACKNOWLEDGEMENT

TUV India wishes to thank all the staff and Management of *Anil Neerukonda Institute of Technology & Science* management, teaching & non-teaching for the kind cooperation and assistance extended to our Auditors during the course of the Green Audit.

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1. EXECUTIVE SUMMARY

Green Audit of Anil Neerukonda Institute of Technology & Sciences was carried out by TUV India during June 2022. The approach taken in this facility included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and associated systems & monitoring equipment. The study covered the areas of Green management to summarize the present status in the campus:

- Waste management
- Green area management

The report accounts for the waste management measures of the *Anil Neerukonda Institute of Technology & Sciences* based on actual assessment. The report compiles a list of possible actions to conserve and efficiently access the available scarce resources and their saving potential is also identified.

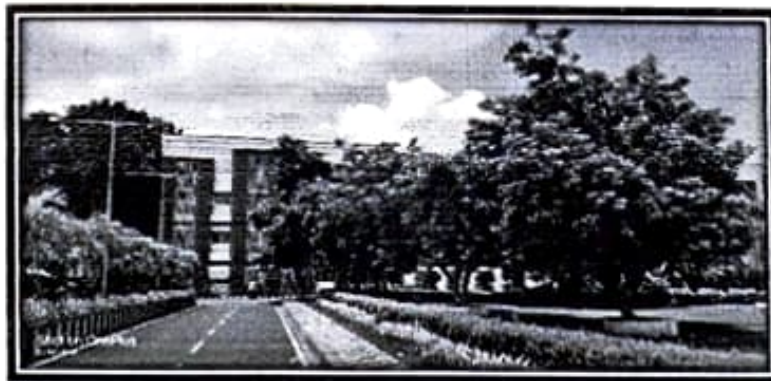


Fig: Greenery around ANITS campus



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2. PROJECT BACKGROUND:

2.1 OBJECTIVE

The scope of work includes gap analysis of the college campus as per applicable regulations and standards relating to sustainability practices.

2.2 METHODOLOGY

The Study team having diversified experience in Green Audits, Energy Audits, Water Audits, ISO 14001, ISO 45001, ISO 14064, ISO 50001, GRI reporting, AA1000AS, GHG Accounting and Sustainability validations/ Verifications along local EHS legislations is identified and formed to conduct the study.

The team verified all applicable environmental aspects as per the GRI (Global Reporting Initiative) Sustainability Reporting Standards for the entire campus including the EHS (Environment and Health Safety) safety requirements to evaluate institution's intent towards the Sustainability and EHS safety in combating climate change as well as their role towards carbon neutrality, GHG mitigation measures, communications to stakeholder and their concerns.

2.3 ABOUT TÜV INDIA

TÜV India Private Limited was incorporated in India in the Year 1989 and is a premier organization in the field of Testing, Certification, Inspection and Training. The company is a subsidiary of TÜV Nord group, which has been working for last 150 Years in the field of Quality, Safety, Health, Standardization, Certification, and Inspection. It has presence in over 70 countries and offers expert services through a global network. With more than 15000 professionals worldwide TÜV Nord has a turnover of over 1 billion Euros. TÜV India offers entire range of services in certification and inspection in India and South Asia with our contingent of professionally qualified and industry experienced Auditors and Inspectors. With a strong team of qualified Engineers having diversified experience in the field of Building Construction, Maintenance, quality assurance, examination of Buildings in distress and related rehabilitation works. We at TÜV ensure to optimize customer operational efficiencies and thereby maximize customer satisfaction



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2.4 ABOUT THE INSTITUTION

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES (ANITS), was established in the academic Year 2001-02 with the approval of the ALL INDIA COUNCIL FOR TECHNOLOGY EDUCATION (AICTE), New Delhi and the Government of Andhra Pradesh and is affiliated to ANDHRA UNIVERSITY (AU), Visakhapatnam.

"ANITS" is located in a plot of 12 acres' area in Sangivalasa Village of Bheemunipatnam Mandalam and is approximately 300 meters from the Chennai - Kolkata Highway.

The campus has a population of around 4,766 of which, 4636 are only day users. Of the total population, 92.02% are Students, while teaching and supporting staff account for 5.24 % and 2.72 %, respectively.

ANITS - Campus Population



■ Students ■ Teaching Staff ■ Non Teaching Staff

2.5 INFRASTRUCTURE:

The college campus is spread over an area of over 12 Acres with amenities like Central library, Class Rooms & Seminar Halls, Transport, Hostels for Boys & Girls, Cafeteria, Medical and Sports.



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3.0 GREEN AUDITING AT ANITS

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The criteria, methods and recommendations used in the audit were based on the identified risks.

The methodology includes:

- Preparation and filling up of questionnaire
- Physical inspection of the campus
- Observation and review of the documents
- Interviewing responsible persons and data analysis
- Recommendations

DATA COLLECTION

Data collection phase was performed using different tools such as observation, survey communicating with responsible persons and measurements. Data collection was done from the primary sources. Following steps were taken for data collection:

- The team visited each department, centers, Library, canteen, gardens, campus etc.
- Data on the general information was collected by observation and interview.
- Plants were identified using standard taxonomic books.
- Waste generated was assessed at the source of production



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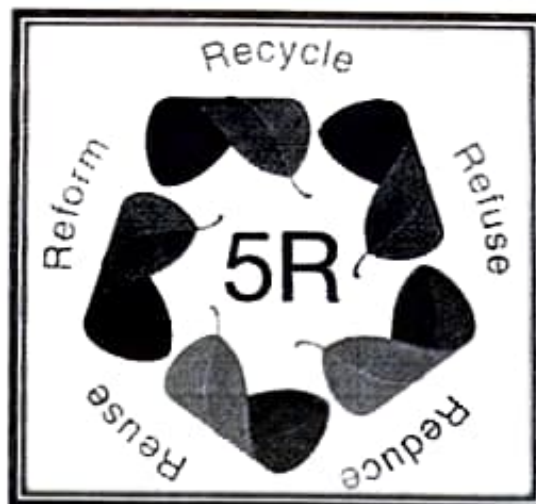


4.0 SCENARIO AT ANITS CAMPUS

The wastes generated from academic and administrative divisions only could be taken in to account, as the total institution could not be covered for certain limitations. The wastes generated from the academic and administrative divisions are characterized into

- (a) Wet Waste;
- (b) Paper & Board waste;
- (c) Metallic waste;
- (d) Plastic Waste;
- (e) Battery waste
- (f) E-waste.

The waste management is one area where the institution is focusing on application 5 R's principle. The Institution has initiated several good initiatives in the field of solid waste management. Within each building or facility, at all common places, at convenient points, semi-closed dust/waste bins were placed to dispose all types of dry wastes.





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DISPOSAL OF WET-WASTE & DRY WASTE:

One large bin is placed near the major entries of each building/ Department. The wet wastes are cleared on daily basis and are transferred to the compost area. On the other hand, the dry wastes are cleared from their bins twice a week, and are transferred to the common place where they are segregated to different waste types and disposed to authorized vendors. All the students are encouraged to examine the dry waste and to take up team projects to develop innovative systems for the use of such wastes or their minimization.



Figure: Large Bins placed at the entry point of all Departments



Figure: Wet waste & Dry Waste Bins placed in every floor



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5.0 WASTE MANAGEMENT

Waste Management of the campus was a methodically process which was used determine the amount and types of waste that are generated by an organization. Information from this assessment helped the management to determine how we can reduce the amount of waste that an institution generates. In most work places, cardboard, paper, plastics, metals and food constitute the majority of what goes in the garbage. Pollution from waste is aesthetically unpleasant and results in large amount of litter in the campus premises which can cause health problems.

Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. General wastes include what is usually thrown away in the campus such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. The auditor diagnosed the prevailing waste disposal policies and suggests the best way to combat the problems.





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Solid Waste management is important for an eco-friendly campus. Different types of solid wastes in the college are generated, its collection and management are very challenging. The following data provide the details of the waste generated and the disposal method are recommended to the college.

Types of Solid waste	Particulars	Recommended Disposal method
Plastic waste	Pen, refill, plastic water bottles, wrappers, other plastic containers, print cartridges, polythene bags	Direct selling to authorized recycler
E-waste	Computer , electronic parts, old and damaged equipment	Direct selling to authorized recycler
Construction waste	Damage furniture, Construction wood waste (Workshop)	Reuse after maintenance and recycle
Bio-degradable waste	Food waste, organic waste, green waste	Can be used as manure in gardening
Paper waste	Paper waste in the examination department	Direct selling to authorized recycler
Glass waste	Broken Glassware from labs	Direct selling to authorized recycler
Sanitary waste	Sanitary Napkins	Open pit and burning



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6.0 HYGIENE IN THE CAMPUS

The campus has state of the art infrastructure like laboratories, central library, central canteen and conference halls. In order to maintain good hygiene, the premises are cleaned regularly. During a physical inspection, the audit team found the campus to be very hygienic.

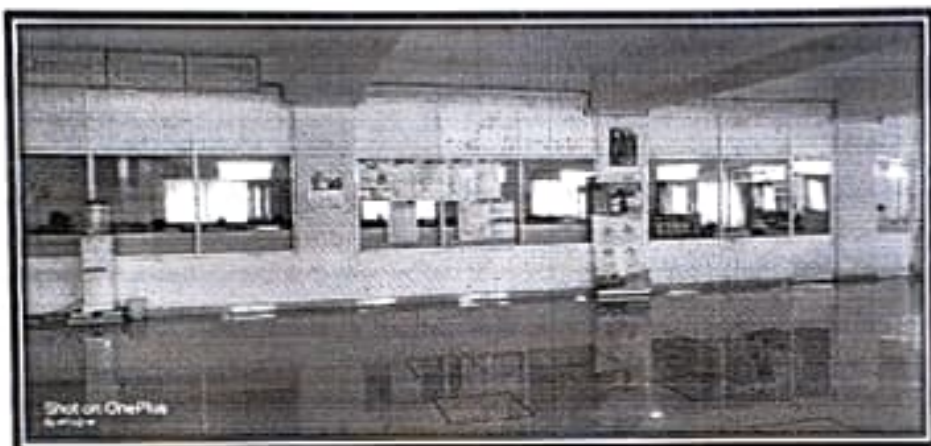


Fig: Hygiene at Central Library



Fig: Hygiene at Chemical Laboratory



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SOLID PRACTICES IN ANITS

- The Institute is conducting awareness programs on various waste management practices for students, teaching & non – teaching staff
- The Institute is segregating Dry Waste & Wet Waste separating for safe disposal of wastage generated in campus.
- The management has installed a Sewage Treatment Plant in campus which will be utilized to safely dispose the waste water generated from laboratories, central canteen and other departments in campus

AWARENESS ON SOLID WASTE MANAGEMENT

An Awareness program on Solid Waste Management was conducted in the month of June 2022 in association with the NSS Unit of ANITS College with an objective to inculcate the habit of waste management and cleanliness of the college campus among the students, teaching & non - teaching staff





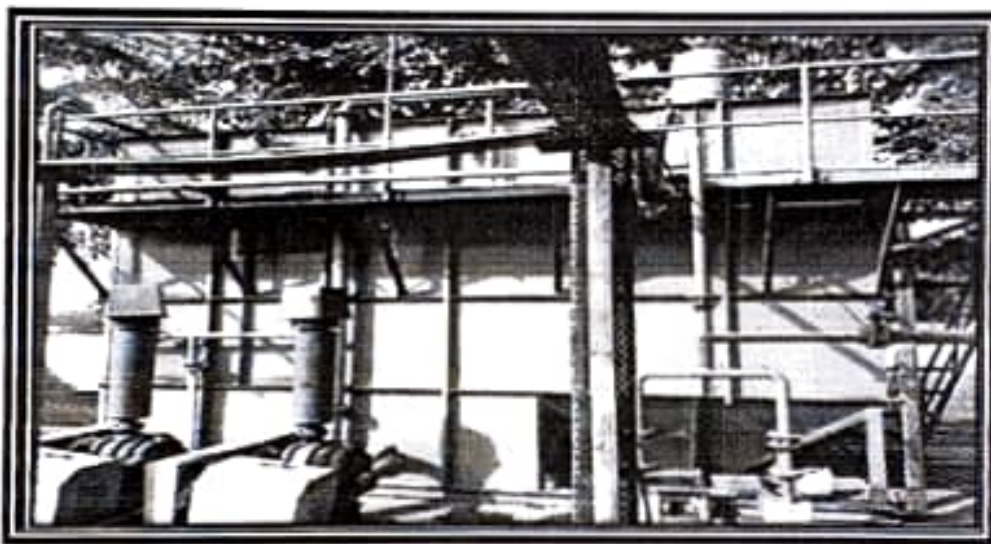
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SEWAGE TREATMENT PLANT

The management have installed a common Sewage treatment plant for the Institute and Hospital located advance to the campus. It is utilized to treat the waste water generated in the campus premises



4.0 AUDIT RECOMMENDATION

- It is recommended to form a Waste management committee and draft rules, guild lines and policies for enhancing the process of Waste Management in the campus.
- It is recommended to recycle of waste papers generated in examination department from a authorized recycler.
- It is recommended to increase the number of display boards on environmental awareness such as – save water, save electricity, no wastage of food/water, no smoking, switch off light and fan after use, plastic free campus etc.
- It is recommended to propose a Environmental Club for students and conduct exhibition of recyclable waste products.



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5.0 CONCLUSION

The green audit reports assist in the process of attaining an ecofriendly approach to the sustainable development of the college. The results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices.

This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development. It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organization.

An outside view, perspective and opinion often helps staff who have been too close to problems or methods to see the value of alternative approaches.

6.0 REFERENCE STANDARDS & REGULATIONS

- GRI Standards
- GHG Protocol Corporate Standard
- National Building Code 2016
- ISO 14064
- ISO 14040/44 Life Cycle Assessment
- True Rating Methodology for Waste Management
- Standards & Biodiversity by IISD

GREEN AUDIT REPORT



**ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES (A)
(ANITS)**

Sangivalasa, Bheemunipatnam Mandal, Visakhapatnam,

Andhra Pradesh-531162, India

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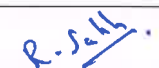
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**ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES (A)
(ANITS)**

Sangivalasa, Bheemunipatnam Mandal, Visakhapatnam,

Andhra Pradesh-531162, India

GREEN AUDIT ASSESSMENT TEAM

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1	Dr.B. N. D. Narasingarao	Professor, HOD Department of Civil	Coordinator	
2	Mr. J. Harsha Vardhana Reddy	Assistant Professor Department of Civil	Member	
3	Dr.S. Siva Kumar	Assistant Professor, Department of Chemistry	Member	
4	Dr. R. Satish	Assistant Professor, Department of EEE	Member	
5	Prof B Vijaya sarathi	Professor, Dept of Civil, AU	External Member	

PREAMBLE

Anil Neerukonda Institute of Technology and Sciences (ANITS), with the approval of the All-India Council for Technical Education, New Delhi and the Govt. of Andhra Pradesh, was established in the Academic Year 2001–02 by Anil Neerukonda Educational Society (ANES) which was founded by Dr.N.B.R. Prasad, an NRI philanthropist from the USA in memory of his son Late Anil Neerukonda to provide quality educational services in the fields of Technology and Sciences. The institute is affiliated to one of the oldest universities of India, Andhra University, Visakhapatnam. The institute is located in Sangivalasa, in Bheemunipatnam Mandal of Andhra Pradesh and is at a distance of 30 km from Visakhapatnam. Started with an intake of 220, the institute presently offers 9 undergraduate programmes in ECE, EEE, CSE, CSE (DS), CSE (AI& ML), IT, Mechanical, Civil & Chemical and 6 post graduate programmes in Communications Systems, Control Systems, Computer Science & Technology, Machine Design, Biotechnology & Soil Mechanics with an intake of 1080 in UG and 99 in PG courses respectively. In the path of providing the highest quality education and continuous improvement in academic and research activities, the institute was first accredited by NBA in 2008 for four programmes and for 5 programmes in 2013 and 2016. NBA accreditation for 7 UG programmes in under progress. The institute was recognized as research center by Andhra University and recognized under 2(f) & 12(b) of UGC act in 2013. ANITS was accredited by NAAC. In order to have flexibility to incorporate the latest developments in science & technology and brining in requirements of the industry into curriculum, ANITS become Autonomous in 2015-16. The institute was recognized as Skill Excellence Center by Govt., of Andhra Pradesh in 2017.

VISION AND MISSION STATEMENTS OF THE INSTITUTION:

Vision

ANITS envisions emerging as a world-class technical institution whose products represent a good blend of technological excellence and the best of human values.

Mission

To train young men and women into competent and confident engineers with excellent communicational skills, to face the challenges of future technology changes, by imparting holistic technical education using the best of infrastructure, outstanding technical and teaching expertise and an exemplary work culture, besides molding them into good citizens.

Campus and Physical Infra:

ANITS has a campus of 4.54 hectares, managed with green development concepts. As per the land management documents of the Institution, an area of 7978.60 m² is under built up area, while the remaining area is under Open category, either under Play fields or under parks and green belt.

	Land use Type	Extent (m²)
1	Total area	45484
2	Built up Ground area	7978

Campus Population:

The campus has a population of around 4,766 of which, 4636 are only day users. Of the total population, 92.02% are Students, while teaching and supporting staff account for 5.24 % and 2.72 % respectively

Green Campus & Green Audit Initiative

ANITS, as a lead institute of the region, is committed to educate its students and employees on environmental concerns and sustainability and to make the campus Carbon Neutral Campus within 5 years from the year 2020 – 2021. Towards this, Green Audit of the institution is initiated along with several Sustainability initiatives beyond the recommendations of the AICTE, so as to ensure that the campus complies with the Sustainable Development Goals (SDGs) and will be a role model to all other Institutions.

Based on the decision of the management, the Institute Principal has entrusted the work to green audit committee for assisting the institute in achieving the goal of the institute.

SCOPE, OBJECTIVES & STRATEGY FOR ANITS GREEN AUDIT

Green audit enables to identify and provide opportunities to promote sustainable development practices, enhance environmental quality, improve health, hygiene and safety, save resources and achieve values of virtue. Green Audits are a sub-set of Environmental audits and can be a highly valuable tool for educational institutions in a wide range of ways to improve their environmental and economic performance and thereby their reputations. The scope of the Green Audit for ANITS is so designed that the process and audit outcome should not only define the state of various environmental components, but also help the institution to compare its own programmes and activities over different years and to compare with other peer institutions. Other benefits should include, educating the students and employees on the

environmental issues; identify areas for improvement and prioritize the implementation of future projects. An effective and systematic scheme was designed and adopted to establish the baseline data for various environmental conditions. The aim of green auditing is to help the institution to adopt sustainable development practices and to inculcate these concepts in the minds of young engineers and through them to the nation.

General and Specific Objectives of Green Auditing

The general objective of green audit is to prepare a baseline report on the status of wastes generated and to mitigate resource wastage and improve resource quality and sustainable practices by involving the campus community and through them to reach the public.

The specific objectives are:

- To monitor the energy consumption pattern of the college.
- To suggest sustainable energy usage and water conservation practices.
- To assess the water usage and its quality, within the college campus.
- To find out various sources for generation and mitigation of different wastes.
- To suggest measures to improve biodiversity within the college campus.

GREEN AUDIT SUMMARY RESULTS

The Green audit of 2020-2021 covers the period between June 2020 to May 2021. However, the last two months of this period (April 2021 to May 2021) being the Covid19 lockdown period, those two months information on the resources consumption and conservation do not reflect the true status. Hence, the effective period for the Audit is only 10 months.

1. LAND USE:

The Green status of the land use in the ANITS, with nearly 32% of the area under open uses, can be considered as very good land use planning. The per capita open area is around 3.624 m² which is fairly very good and among similar level institutions under private sector, the status is **High healthy**

	Land Use	Extent (m ²)	Extent (ha)	% of Land Area
1	Built-up Ground Coverage	7978.60	0.80	17.54
2	Total Parking Area	8974.74	0.90	19.73
3	Tot-Lot + Play Ground Areas	5306.16	0.53	11.67
4	Roads and Tracks	5951.80	0.59	13.08
5	Vacant Site Area	17272.70	1.72	37.98
	TOTAL AREA	45484	4.54	

The land use can be considered as highly balanced as per the norms for institutions of higher learning. Though the vacant site area, was marked for greening, the total open area (areas under roads and Tracks; Playground areas and more than 80% of the Parking areas are left open to sky, thereby enabling free wind flow, good harvesting of rain waters through natural percolation.

2. WATER

ANITS well aware of the importance of water and has a dedicated water management cell. Water is used for different purposes like, Drinking; Other domesticated uses; Laboratories; House Keeping and Greenery. For all the uses, ANITS depends upon ground water only as there was no public supply facility.

ANITS taps around 40 KLD of water from 4 bore wells, and has an installed capacity of 40 KLD above ground storage tanks. The mean distribution of the water for different uses is as follows:

S.No	Purpose	Quantity (KLD)	(% Total)
1	Drinking	6	15
2	Other Domestic Uses	14	35
3	Laboratories & Other facilities	18	45
4	Greenery	2	5

On the whole, the drinking water availability is at 1.2 litres/head and 99 % of the campus population stays in the campus for less than 8 hours, the drinking water availability is reasonably good compared to the standard of 5 litres/head/24hrs. ANITS has a R.O. Plant with an installed capacity of 6000 litres/day, and through which Reject water of 10000 litres/day will be generated for an operating period of 6 hours. More than a half of which is used for floor washes and the remaining for the greenery. The RO plant water also is used by neighbouring sister institution of the ANITS group. Department of chemistry analyses the water samples collected from RO unit for all the important parameters on a quarterly basis

3. ENERGY

ANITS is one of the few institutions in India to have pioneered in the energy conservation and use of renewable energy sources. Basically it uses three types of Energy sources: (1) Electricity from the Public supply and (2) Electricity from the Own Solar plants and (3) Diesel (HSD).

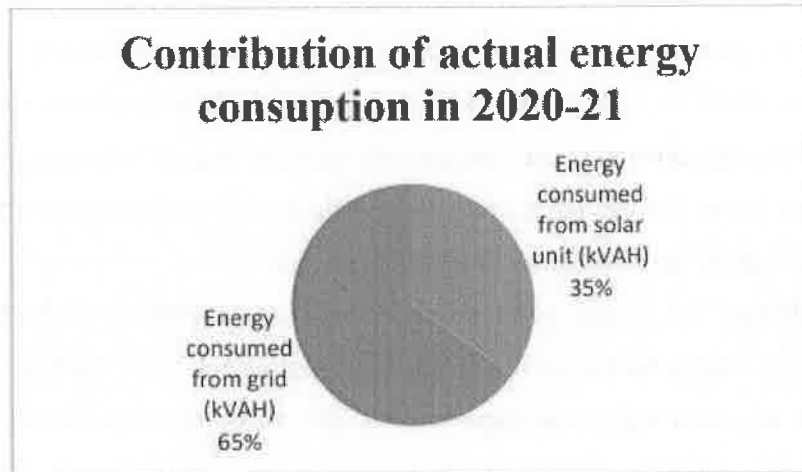
An energy audit is a study of a plant, building or facility to determine how much energy is used and to identify methods for energy savings. Proper balancing in implementation of the new technologies and already existing technology provide the most hopeful prospects for the future. The opportunities lie in the use of existing renewable energy technologies, enhancing the energy efficiency and the distribution of these technologies.

Date collection for energy audit of Anil Neerukonda Institute of Technology and Sciences (ANITS) Campus for the period of April 2020 to March 2021 has been done by the team. This audit was over sighted to inquire about the convenience to develop the energy competence of the campus. This audit is essential to identify the energy proficient appliances/instruments. The data is collected from each classroom, laboratory and every room by considering the number of tubes, fans, ACs, electronic instruments, water purifiers, printers, xerox machines, pumps, projectors etc., present in each room

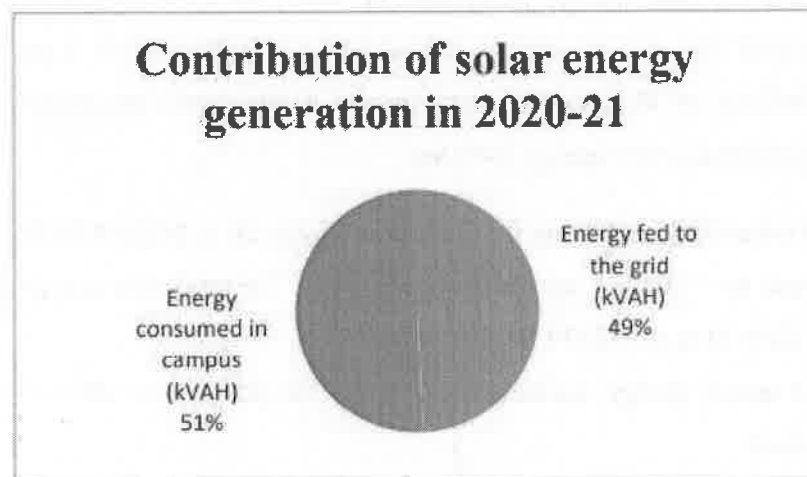
Institute has 450 kVA solar power generation system with 1364 panels installed and is connected to the grid. The energy units consumed from the public supply is exclusive of this power. Thus, addition of this power, accounts for a per capita production of 1963.85 Units/Annum. Highlights of the energy audit are

- I. The total connected load as per the present energy audit is 2423.64 kVA.
- II. The institute has 450 kVA solar power generation. The total solar energy generation in the year 2020-21 is 4,92,227 kVAh/Annum.
- III. The total actual energy consumption in the campus during 2020-21 is 7,16,806 Units/Annum.
- IV. The college has paid total 40,15,795/- Rs/Annum for the electricity bill in 2020-21 which is equivalent to 31.33% of the actual energy consumed. This is due to the availability of solar plant in the campus.
- V. The contract demand is 450 kVA and monthly minimum consumption is 360 kVA. The average measured maximum demand maintained in the year is 120.99 kVA.
- VI. The institute has two capacitor banks of ratings 30 kVAR and 15 kVAR. The Average power factor maintained during the year is 0.9967.
- VII. The institute has a 500 kVA diesel generator set to supply the back-up power

The actual energy consumed in 2020-21 is 7,16,806 Units/Annum. Out of this, the solar unit is contributing 2,49,537 Units/Annum (i.e., 34.81%). The remaining 4,67,269 Units/Annum (i.e., 65.19%) are consumed from the grid



The solar unit is generated 4,92,227 Units/Annum in 2020-21. Out of this 2,42,690 Units/Annum (i.e., 49.30%) are fed to the grid. The remaining 2,49,537 Units/Annum (i.e., 50.70 %) are used in the campus



4. WASTE MANAGEMENT

Solid waste management:

- The dry solid waste is put by the respective departments in a collection pit located within the campus. This dry solid waste is collected every day in the morning and campus is kept clean with as inspiration from Swatch Bharat Mission, Twin-Bin system is being used in the Institute to segregate recyclable and biodegradable waste.
- The used papers and notebooks are collected every semester and recycled. This activity is an exclusive initiative of our students under various clubs.
- Chemical and hazardous waste from laboratories if any are disposed as per norms.
- The campus is Wi-Fi enabled and hence all communication is made online minimizing paper usage.
- Usage of plastic cups, plates and cutlery are banned in the campus as a green initiative.
- Organic waste is composted and used for manure.

Liquid waste management:

- Sewage Treatment Plant (STP) of 200 KL/day capacity is in use both in the Institution campus and Hostel. The treated water is used for flushing and gardening purpose.
- Two STP'S with capacities 300 KLD and 200 KLD are under the premises of ANH, handling waste water from hospital, the Institution campus and hostel.
- Aeration process is being used in the treatment of waste water.
- Liquid chemicals from Chemistry and Environment Engineering Lab are disposed as per safety norms.

E-waste management:

- All Computers, batteries and electronic machinery is purchased under Buy-Back agreement.

Wastes Generation:

The wastes generated from academic and administrative divisions only could be taken in to account, as the total institution could not be covered for certain limitations during this first audit. The wastes generated from the academic and administrative divisions are characterized into

- (a) Wet Waste;
- (b) Paper & Board waste;
- (c) Metallic waste;
- (d) Plastic Waste;
- (e) Battery waste
- (f) E-waste.

The waste generated from the two divisions, from a sampling of 1 month is presented below:

Waste Type	Sources	Qty	Disposal
Wet Waste	Dining Halls & Messes	60 kg/day	Compost
Paper & Board	Administrative & Academic	4.7 kg/day	Authorized Vendors
Metallic	All	0.21 kg/day	Authorized Vendors
Plastic	All	0.36 kg/day	Authorized Vendors
E-waste	All	0.2 kg/day	Authorized Vendors

The waste management is one area where the institution is focusing on application of 5 R's principle so as to enable the young learners for innovations. The Institution has initiated several good initiatives in the field of solid waste management. Within each building or facility, at all common places, at convenient points, semi-closed dust/waste bins were placed to dispose all types of dry wastes. However, for the disposal of Wet-waste, one large bin was placed near the major entries of the buildings. The wet wastes are cleared on daily basis and are transferred to the compost area. On the other hand, the dry wastes are cleared from their bins twice a week, and are transferred to the common place where they are segregated to different waste types and disposed to authorized vendors. All the students are encouraged to examine the dry waste and to take up team projects to develop innovative systems for the use of such wastes or their minimization.

5 Ecological Activities

Environmental and Sustainability Initiatives of ANITS is to realize its Vision of making its campus a Carbon Neutral campus and also to empower its students and employees in addressing the environmental and sustainability challenges of the nation, introduced several activities to create awareness and educational activities. These activities are generally taken up at the department level, while some activities on certain days of international or national importance, the activities are taken up at the Institutional level.

1. Swachh ANITS: The programme was initiated at the Institutional level and coordinated by the NSS wing of the Institution. The programme aims at training the students in the Participatory Management of the Campus and also creates awareness among the students on the Swachh missions of the country. The programme for the year was launched in August 2019, and continued till the end of the academic year. About 120 students (10 to 12 volunteers from each department) have participated in this programme.

2. One student One plant:

Department of Mechanical Engineering, ANITS Successfully organized “One student – One plant” on 11th March 2021. The Program was Organised under U TOO CAN Club. It was organised for inculcating the habit of plantation of saplings in the students. It was organised to understand the importance of trees and how trees protect ecological balance in nature.

3. Save The Beaches: ANITS, as part of its environmental initiatives organizes World Ozone Day every year on September 16th, so as to educate the young engineers on the importance of use of Ozone Depleting Substances in various technologies and gadgets. The programme is conducted at the Institute level.

Concluding Remarks and Audit recommendations

As an environment friendly institution, the institute has solar energy with a capacity of 450kVA, wheeling to eastern power grid and uses LED bulbs for power conservation. The college has a solid waste management system, Sewage Treatment Plant (STP) of 200 KL/day capacity and e-waste management system. Good water conservation facilities such as rain water harvesting pits, bore well recharge system and waste water recycling system are available in the campus. Certain green campus initiatives and barrier free disabled friendly facilities are created. The Institute is adopting vehicle free campus for the students to curb environmental pollution. An inclusive environment is created by maximum participation of stakeholders through various committees, delegating powers, NSS/ club activities. As a mark of respect and showcasing constitutional obligations, various events on days of national significance such as world water day, World environment day, International yoga day, No plastic day etc and activities in tune to the government initiatives such as Swachhbharat etc., are organized in the institute. 2 villages were adopted under UBA (Unnat Bharat Abhiyan) scheme.

The audit team, appreciates the well-designed layout planning of the institute, ensuring 38 % of the land area under open category uses. However, the utilization of the open category lands needs to be further maximized and documented. Although the greenery is good in terms of the extent and numbers, effective planning can enhance the diversity, productivity and sequester more carbon so as to realize the objective of making the campus C-neutral. Although the waste management is in place, it needs more documentation of wastes related to metal plastic, battery and E wastes generated and disposed.



GALLERY



Green ANITS Campus

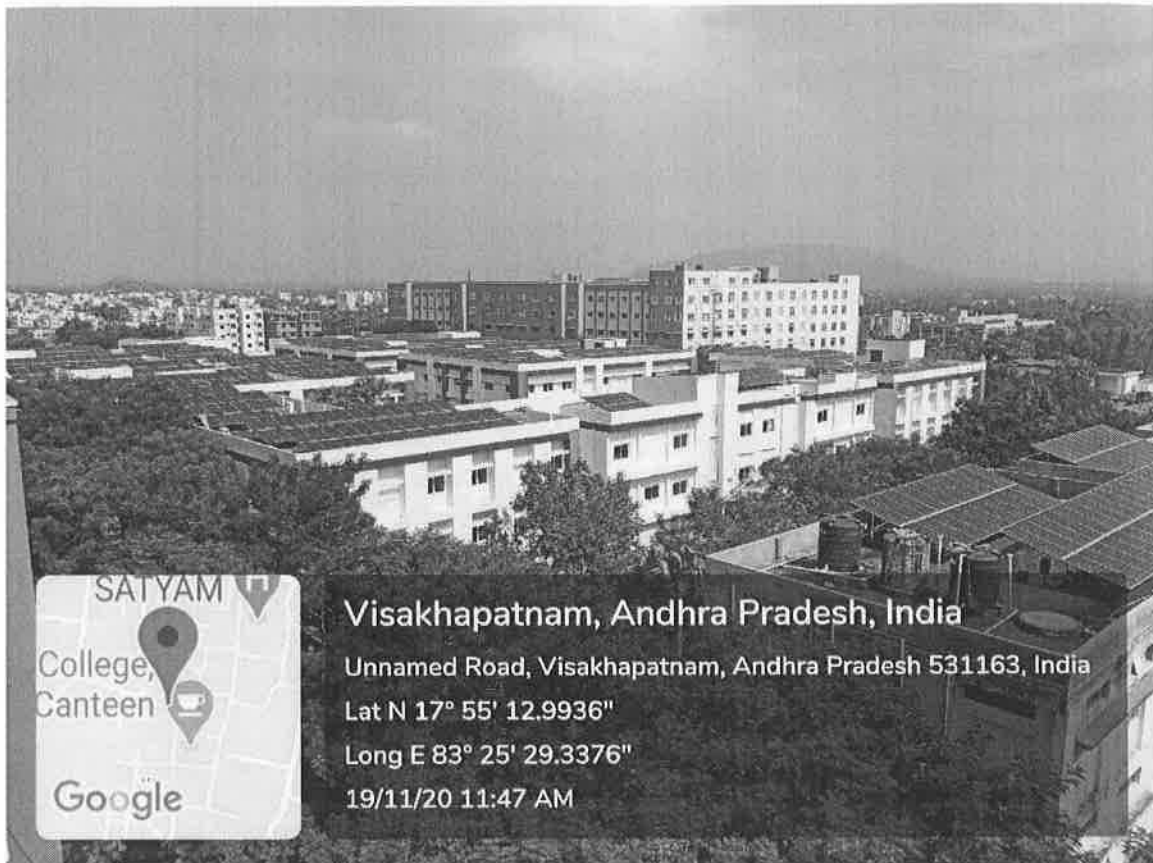


GALLERY

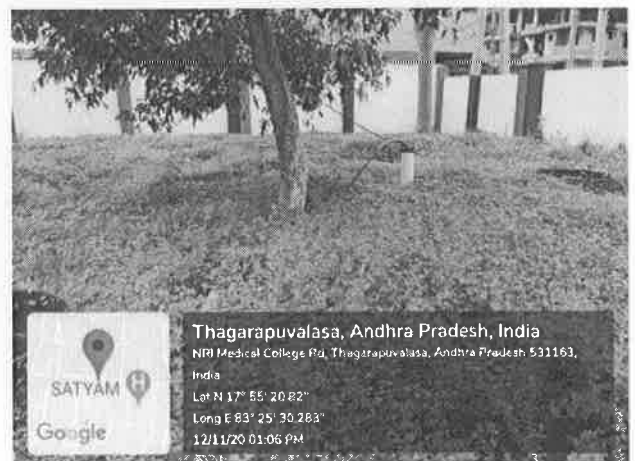
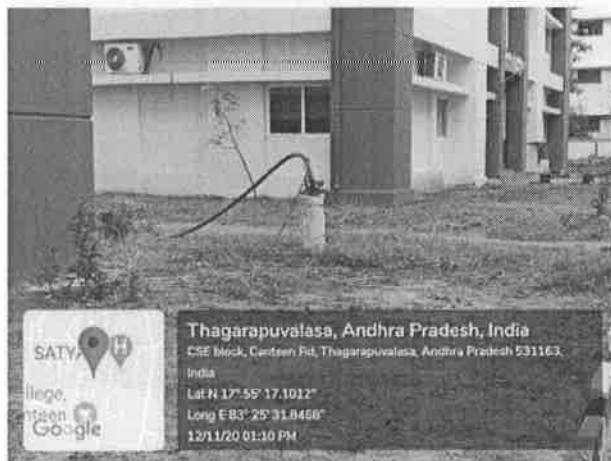




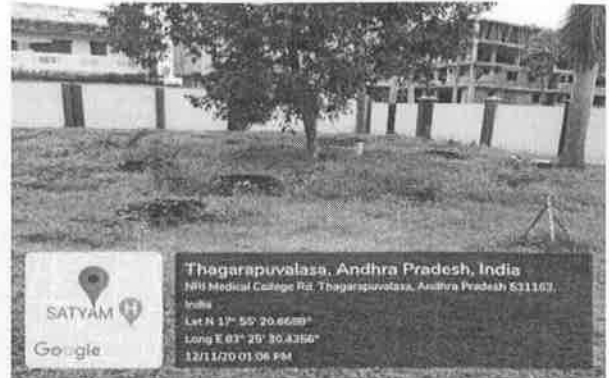
Solar Energy panels



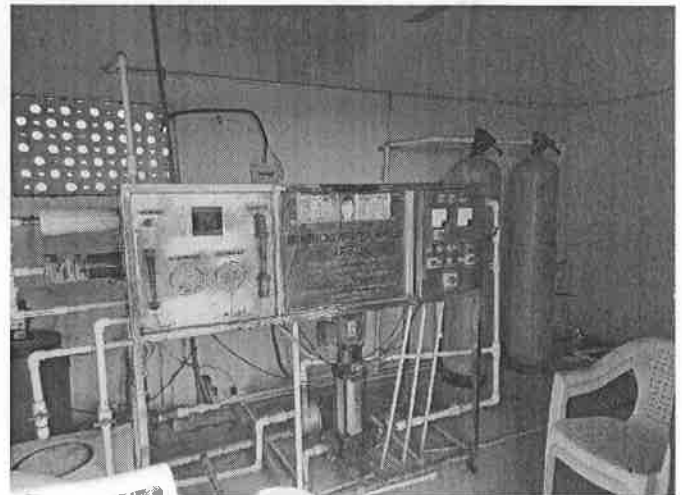
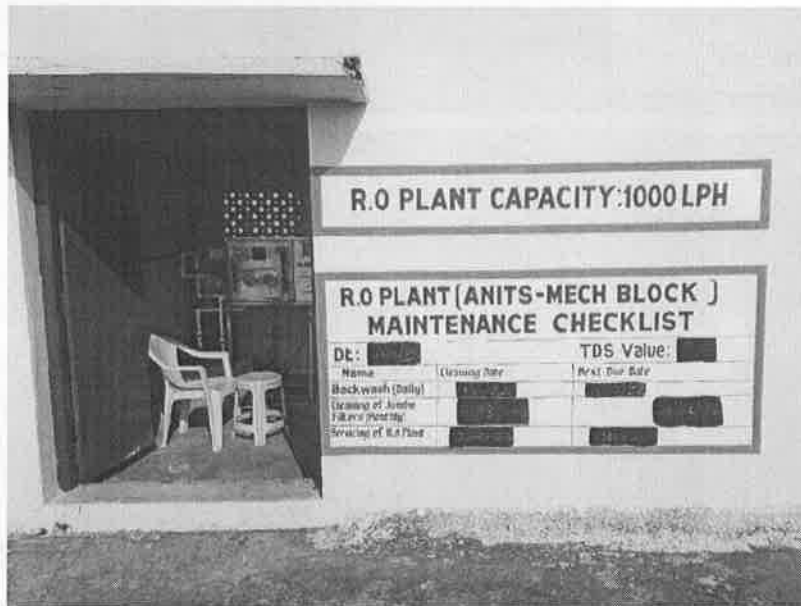
Borewells



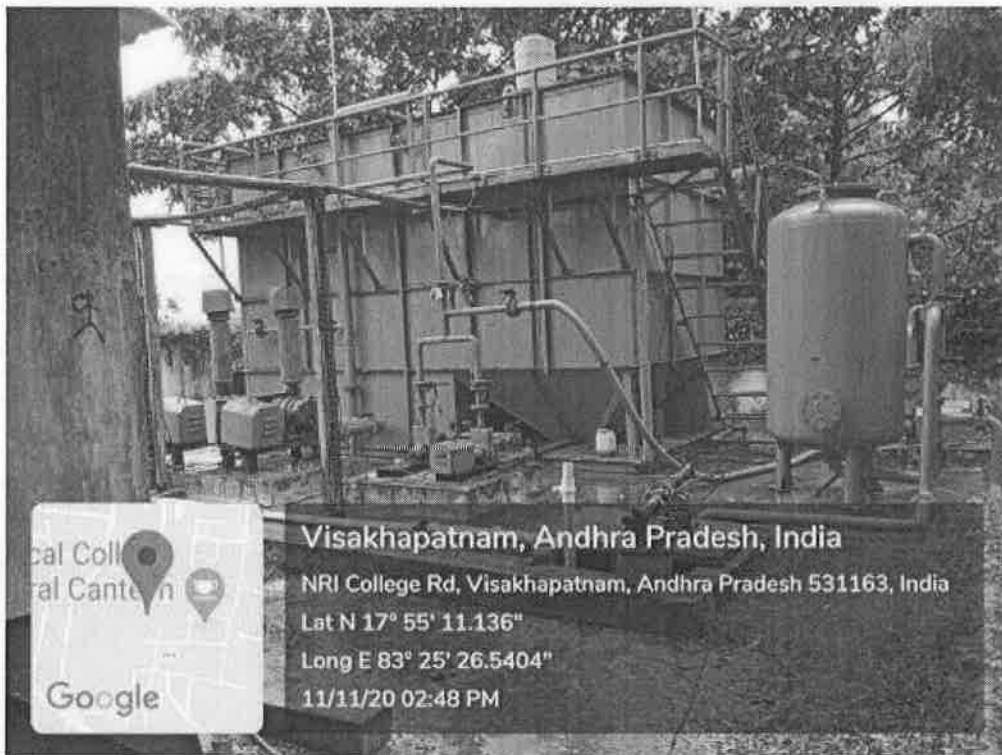
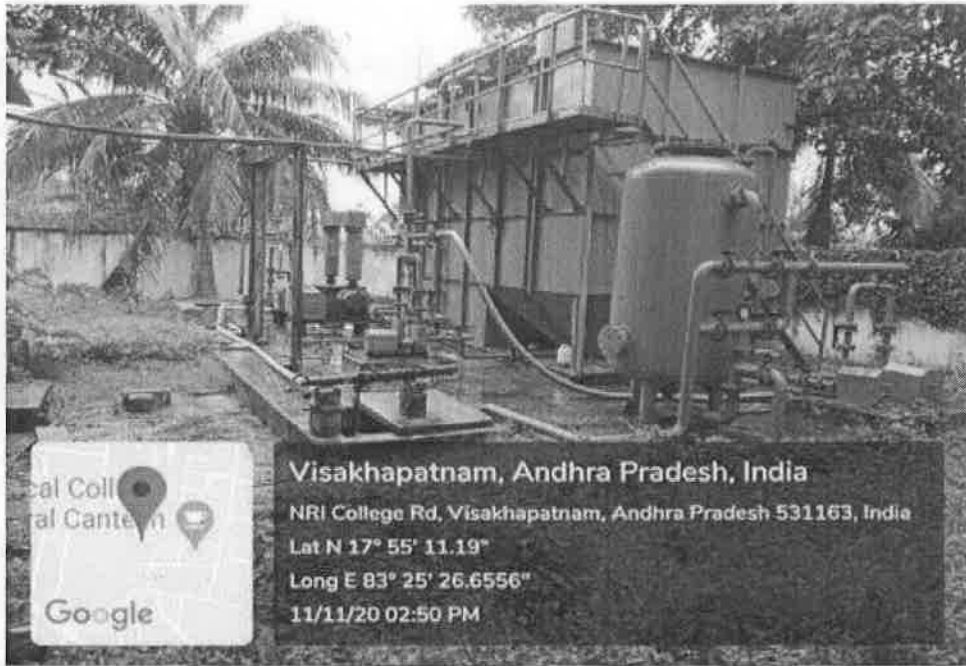
Rainwater Harvesting Pits



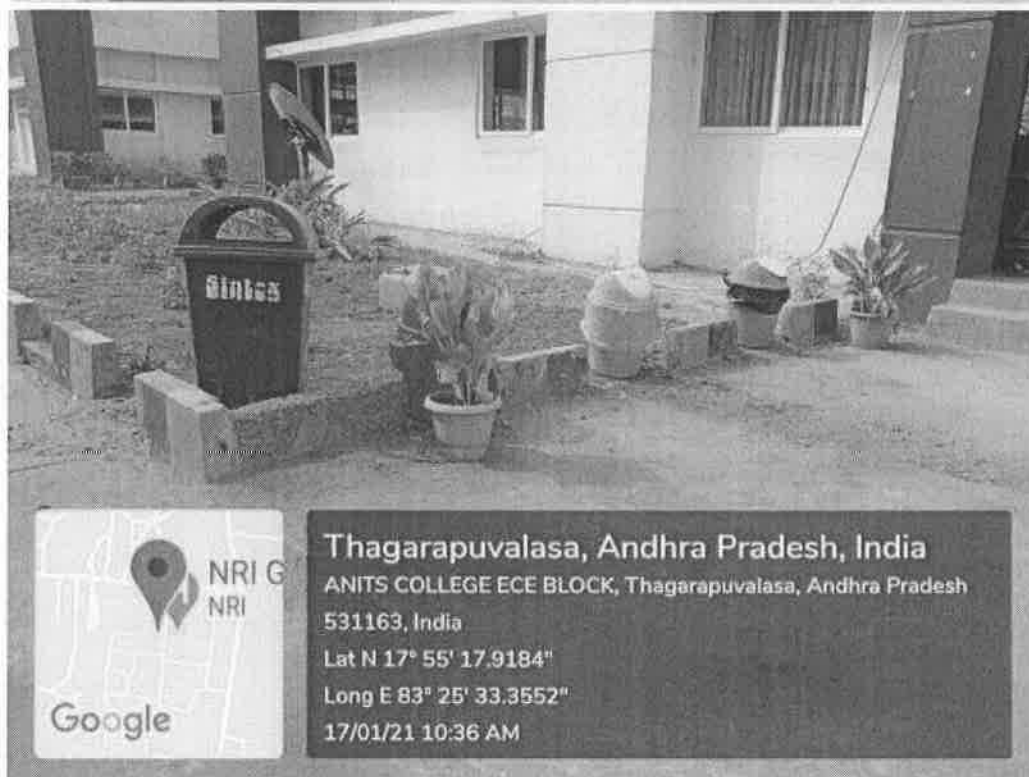
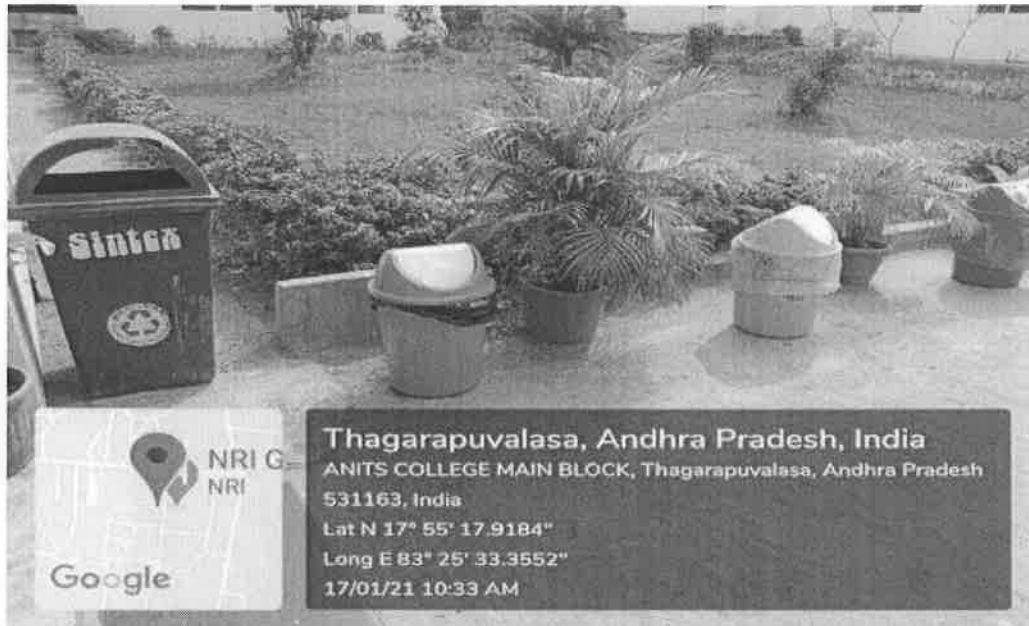
Reverse Osmosis unit



Liquid Waste Treatment and Solid Segregation System



Segregation of waste material in the campus



One Student – One Plant Program



ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES (A)

DEPARTMENT OF MECHANICAL ENGINEERING

(Permanently Affiliated to Andhra University, AICTE, Accredited by NBA, NAAC with grade 'A')

Sangivalasa-531162, Bhocunipatnam Mandal, Visakhapatnam Dt.

Phone: 0893-225081, 226393

One Student – One Plant on 13th March 2021



Active Participation of Faculty coordinators and Students on "One Student – One Plant"

13/3/21
HOD
Mech. Enge

PROFESSOR & HEAD
Department of Mechanical Engineering
ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCE
Sangivalasa-531162 VISAKHAPATNAM DIST. A.P.

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES
GREEN AUDIT REPORT 2019 TO 2020



Audit Team

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(Assistant Professor, Civil Department)

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II	Green Audit Initiatives	5
III	Scope & Objectives	5
IV	Green Audit	9
V	Audit Recommendations	22

I. PREAMBLE

Anil Neerukonda Institute of Technology and Sciences (ANITS), with the approval of the All India Council for Technology Education, New Delhi and the Govt. of Andhra Pradesh, was established in the Academic Year 2001–02 to provide quality educational services in the fields of Technology and Sciences. The institute is affiliated to one of the oldest universities of India, Andhra University, Visakhapatnam.

1. Vision and Mission Statements of the College:

VISION

ANITS envisions emerging as a world-class technical institution whose products represent a good blend of technological excellence and the best of human values.

MISSION

To train young men and women into competent and confident engineers with excellent communicational skills, to face the challenges of future technology changes, by imparting holistic technical education using the best of infrastructure, outstanding technical and teaching expertise and an exemplary work culture, besides molding them into good citizens..

2. Campus and Physical Infra:

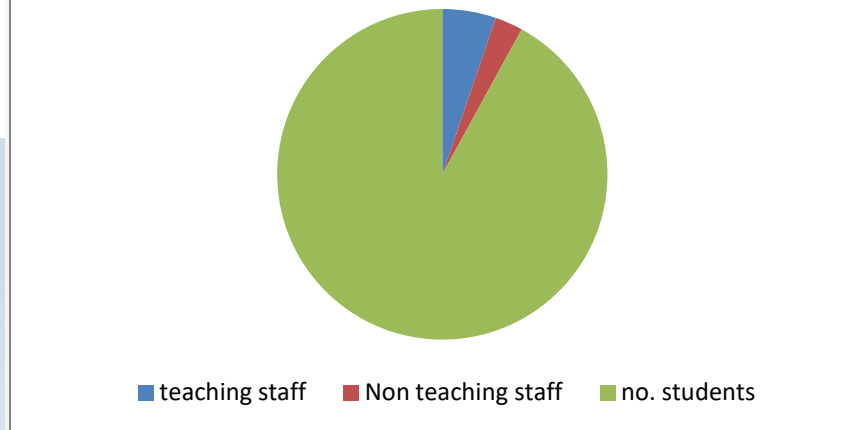
ANITS has a campus of 4.31 hectares, managed with green development concepts. As per the land management documents of the Institution, an area of 7978.60 m² is under built up area, while the remaining area is under Open category, either under Play fields or under parks and green belt.

	Land use type	Extent (m ²)
1	Total Area	45484.00
2	Built up Ground Area	7978.60

Campus Population:

The campus has a population of around 4,766 of which, 4636 are only day users. Of the total population, 92.02% are Students, while teaching and supporting staff account for 5.24 % and 2.72 %, respectively.

ANITS Population Strata



II Green Campus & Green Audit Initiative

ANITS, as a lead institute of the region, is committed to educate its students and employees on environmental concerns and sustainability and to make the campus **Carbon Neutral Campus** within 5 years from the year 2019 – 2020. Towards this, Green Audit of the institution is initiated along with several Sustainability Initiatives beyond the recommendations of the AICTE, so as to ensure that the campus complies with the **Sustainable Development Goals (SDGs)** and will be a role model to all other Institutions.

Based on the Decision of the Management, the Institute Principal has entrusted the work to M/s ENVIRO KAMKAR (LLP), Visakhapatnam for assisting the institute in the conduct of the Green Audit (GA).

III. SCOPE, OBJECTIVES & STRATEGY FOR ANITS GREEN AUDIT

Green audit enables to identify and provide opportunities to promote sustainable development practices, enhance environmental quality, improve health, hygiene and safety, save resources and achieve values of virtue. Green Audits are a sub-set of Environmental audits, and can be a highly valuable tool

for educational institutions in a wide range of ways to improve their environmental and economic performance and thereby their reputations.

The scope of the Green Audit for ANITS is so designed that the process and audit outcome should not only define the state of various environmental components, but also help the institution to compare its own programmes and activities over different years and to compare with other peer institutions. Other benefits should include, educating the students and employees on the environmental issues; identify areas for improvement and prioritize the implementation of future projects.

An effective and systematic scheme was designed and adopted to establish the baseline data for various environmental conditions. The aim of green auditing is to help the institution to adopt sustainable development practices and to inculcate these concepts in the minds of young engineers, and through them to the nation.

1. General and Specific Objectives of Green Auditing

The general objective of green audit is to prepare a baseline report on the status of (i) biodiversity and other resources, (ii) wastes generated and to mitigate resource wastage and improve resource quality and sustainable practices by involving the campus community and through them to reach the public.

The specific objectives are:

- To prepare a checklist of flora and fauna diversity in and around the college campus.
- To suggest measures to improve biodiversity within the college campus.
- To monitor the energy consumption pattern of the college.

- To assess the water usage and its quality, within the college campus.
- To suggest sustainable energy usage and water conservation practices.
- To find out various sources for generation and mitigation of different wastes.

2. Strategy for Green Audit at ANITS:

This being for the first time for the ANITS of conducting a Green Audit, the audit programme was developed after detailed deliberations initiated by the management, staff and the external auditors, M/s. EKR. The GA period was synchronized with the academic year (June 2019 to May 2020). The whole process was divided into three stages:

A) Pre-Audit Stage: During this stage, with the Principal of the Institution on Chair, the GA Team was constituted with five Core Members (Three from the Institution and the remaining two from the third party consultant organization, EKR. The Institutional members, have involved all the department and other unit heads of the ANITS, comprising the teaching, administrative and other allied units of the institution and the GA protocols, requirements for collecting the audit evidences and the implementation schedules were prepared.

B) Audit Stage: During this stage, collection and validation of the audit evidences are the main activities which are on day-to-day basis and require systematic book keeping and data base development. This being the first ever audit for the ANITS, the procedures and methods were reviewed on monthly basis by the core team and validation of GA evidences were streamlined for the primary sectors of Landuse, Water, Air Quality,

Greenery, wastes generated and safe disposal of wastes. Along with these, training and awareness programmes for the Students, Teaching staff and supporting staff are conducted by the EKR. At the end of this stage, during May 2020, the audit results were analyzed and the audit report was presented to the Management of the ANITS.

C) Post-Audit Stage: This stage includes management's review of the GA report issue terms of reference to initiate the GA for the next year.



IV, GREEN AUDIT SUMMARY RESULTS

The Green audit of 2019-2020 covers the period between June 2019 to May 2020. However, the last two months of this period (March 20th 2020 to May 31st 2020) being the Covid19 lockdown period, those two months information on the resources consumption and conservation do not reflect the true status. Hence, the effective period for the Audit is only 10 months.

1. LAND USE:

The Green status of the land use in the ANITS, with nearly 32% of the area under open uses, can be considered as very good land use planning. The per capita open area is around 3.624 m², which is fairly very good and among similar level institutions under private sector, the status is **High healthy**.

#	Land Use	Extent (m ²)	Extent (ha)	% of Land Area
1	Built-up Ground Coverage	7978.60	0.80	17.54
2	Total Parking Area	8974.74	0.90	19.73
3	Tot-Lot + Play Ground Areas	5306.16	0.53	11.67
4	Roads and Tracks	5951.80	0.59	13.08
5	Vacant Site Area	17272.70	1.72	37.98
	TOTAL AREA	45484.00	4.54	

The land use can be considered as highly balanced as per the norms for institutions of higher learning. Though the vacant site area, was marked for greening, the total open area (areas under roads and Tracks; Play ground areas and more than 80% of the Parking areas are left open to sky, thereby enabling free wind flow, good harvesting of rain waters through natural percolation.

GREENERY:

The present one being the 1st ever GA for this institute, the audit for the greening was limited to the **Tree Cover** only, while the other vegetation strata was not considered as most of them are either annuals or ornamental exotics. results indicate that about 80% of the Open Areas in the campus are covered with vegetation.

The general pattern of the vegetation is more **peripheral** to the individual blocks than to the campus boundary. The campus has a boundary length of around 1200 m, while 42% of the length has matured tree cover. Similarly, the areas between different building blocks also have dense tree cover (Fig. 1).



In terms of species diversity, number of trees and biomass quantities, the assessment was made and the results indicate that, the diversity of the tree cover and biological productivity from the available land has good scope for improvement. However, the present state of the tree species diversity and their enumeration are reported.

A total of 634 individual trees belonging to 17 tree species were recorded in the ANITS campus (Table T). Their composition indicates that most of them are native species of economic importance. The distribution of the trees into different girth classes (Table G) indicate that 70% of the trees are aged less than 20 years old, revealing that most of them were planted after the campus is initiated.

Table T: Tree Populations of ANITS campus:

No.	Family	Scientific Name	Vernacular Name	No.
1	ANACARDIACEAE	<i>Mangifera indica</i>	Mango	46
2	APOCYNACEAE	<i>Cascabela thevetia</i>	Pachha Ganneru	56
3	ARECACEAE	<i>Borrassus flabellifer</i>	Thati	58
4	ARECACEAE	<i>Cocos nucifera</i>	Coconut	47
5	ARECACEAE	<i>Dypsis lutescens</i>	Areca Palm	37
6	COMBRETACEAE	<i>Terminalia catappa</i>	Badam	40
7	FABACEAE	<i>Delonix regia</i>	Thurai	48
8	FABACEAE	<i>Caesalpinia pulcherrima</i>	Pamidi Thangedu	22
9	FABACEAE	<i>Dalbergia sissoo</i>	Indian Rosewood	1
10	FABACEAE	<i>Millettia pinnata</i>	Kanuga	42
11	FABACEAE	<i>Peltophorum pterocarpum</i>	Konda Chinta	6
12	FABACEAE	<i>Saraca asoca</i>	Ashoka	62
13	MELIACEAE	<i>Azadirachta indica</i>	Neem	49
14	MORACEAE	<i>Ficus religiosa</i>	Ravi	6
15	MYRTACEAE	<i>Psidium guajava</i>	Guava	52
16	MYRTACEAE	<i>Syzygium cumini</i>	Neredu	3
17	RUBIACEAE	<i>Neolamarcia cadamba</i>	Kadamba	42
18	SAPINDACEAE	<i>Sapindus emarginatus</i>	Kunkudu	17
TOTAL				634

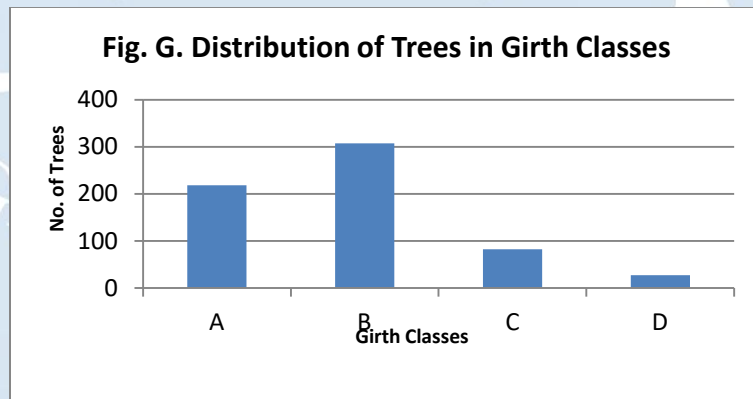
Table G. Distribution of Tree populations in to different Girth Classes.

No.	Scientific Name	Vernacular Name	Girth Classes				No.
			A	B	C	D	
1	<i>Mangifera indica</i>	Mango	-	36	7	3	46
2	<i>Cascabela thevetia</i>	Pachha Ganneru	29	27	-	-	56
3	<i>Borrassus flabellifer</i>	Thati	-	12	37	9	58
4	<i>Cocos nucifera</i>	Coconut	-	29	12	6	47
5	<i>Dypsis lutescens</i>	Areca Palm	-	27	7	3	37
6	<i>Terminalia catappa</i>	Badam	18	20	2	-	40
7	<i>Delonix regia</i>	Thurai	21	24	3	-	48
8	<i>Caesalpinia pulcherrima</i>	Pamidi Thangedu	3	19	-	-	22
9	<i>Dalbergia sissoo</i>	Rosewood	-	1	-	-	1
10	<i>Millettia pinnata</i>	Kanuga	31	11	-	-	42
11	<i>Peltophorum pterocarpum</i>	Konda Chinta	2	4	-	-	6
12	<i>Saraca asoca</i>	Ashoka	5	44	9	4	62
13	<i>Azadirachta indica</i>	Neem	13	30	4	2	49
14	<i>Ficus religiosa</i>	Ravi	4	2	-	-	6
15	<i>Psidium guajava</i>	Guava	52	-	-	-	52
16	<i>Syzygium cumini</i>	Neredu	-	2	1	-	3
17	<i>Neolamarcia cadamba</i>	Kadamba	26	16	-	-	42
18	<i>Sapindus emarginatus</i>	Kunkudu	34	3	-	-	17
TOTAL			218	307	82	27	634
			A = <40 cm;	B = 41 – 90 cm;	C = 91 – 140 cm;	D = > 140	

The two interesting native species are (1) *Neolamarcia cadamba*, a sacred tree species popularly called as Kadamba; and (2) *Dalbergia sissoo*, called Rose wood tree, a highly commercial wood species. Of these two species, the former is in good numbers, while the second one is a lone individual.

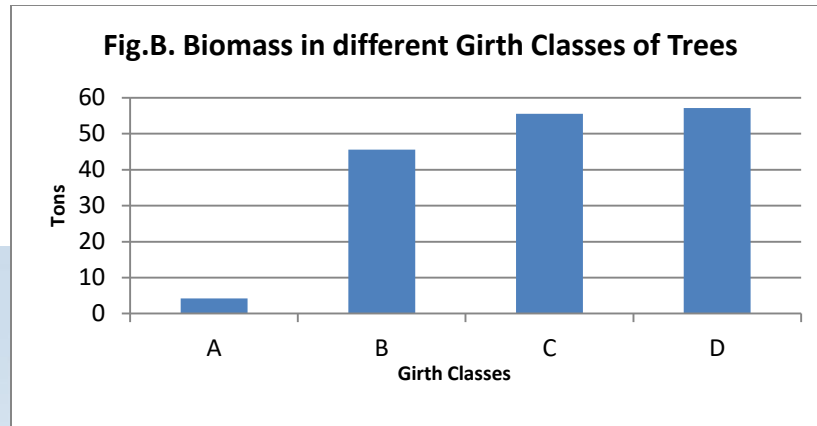
Trees Enumeration:

The tree species were enumerated and the results are presented in Annexure – F2. The results indicated that there are nearly 634 trees. Of six are fruit bearing trees and account for 32.33% of the trees. Among the remaining lot, palm species dominate and account for 22.4% of the trees. By age distribution as was estimated from the Girth classes (Fig. G), majority were in the two lower age classes (A and B).



a) Biomass of Trees:

Woody biomass was estimated through ecological methods, and the top nine species which were high in numbers have contributed significantly to the biomass. On the whole, all the tree strata together have contributed 162.35 tons of biomass, with a mean of 0.256 t/tree. The stocks in different girth classes of the trees are shown in Fig. B.



b) Carbon Stocks:

With the tree biomass, the Carbon stocks in the ANITS campus lands was estimated using standard stock assessment methods based on the formula of C in the Above Ground Biomass (AGC) + C in Below Ground Biomass (BGC)+ Soil Organic Carbon (SOC). In case of SOC, only the “*Vacant Land Site*” of 17272 m² of area was taken in to consideration, as this area only can sequester the SOC in future. The Carbon stock in the AGC was estimated at 82.8 tons C; while the stocks in the BGC and SOC were estimated at 21.5 tons C and 323.8 tons C, respectively. ***The scope for improvement is significant.***

Associated Fauna:

A good number of animal species associated with the ANITS campus greenery indicate that the greenery is provisioning biodiversity services. Some of the Avian (Bird) species, and other animals observed and identified by the students are presented in this report and these mostly include 16 species of Birds; 5 species of Butterflies; and one squirrel species. Only such species, which are very frequently observed in the campus are included in this.

Butterfly species	
Common Name	Scientific Name
Common tiger	<i>Danaus genutia</i>
Lime butterfly	<i>Papilio demoleus</i>
Common pierroot	<i>Castalius rosimon</i>
Common crow butterfly	<i>Euploea core</i>
Dark Blue Tiger	<i>Tirumala septentrionis</i>
Avian Species	
Common Name	Scientific Name
Indian roller	<i>Caoracias benghalensis</i>
Cattle egret	<i>Bubulcus ibis</i>
Green bee eater	<i>Merops orientalis</i>
Blue rock pigeon	<i>Columba livia</i>
Common Myna	<i>Acridotheres tristis</i>
Black Drongo	<i>Dicrurus macrocercus</i>
Black kite	<i>Milvus migrans</i>
House crow	<i>Corvus splendens</i>
Jungle crow	<i>Corvus macrorhynchos</i>
Alexandrine parakeet	<i>Psittacula eupatria</i>
Rose Ringed Parakeet	<i>Psittacula krameri</i>
Spotted Dove	<i>Streptopelia chinensis</i>
Common Myna	<i>Acridotheres tristis</i>
Common House sparrow	<i>Passer domesticus</i>
Common Koel	<i>Eudynamys scolopaceus</i>
Mammalian species	
Common Name	Scientific Name
Indian squirrel	<i>Funambulus palmarum</i>

2. WATER:

ANITS well aware of the importance of water and has a dedicated water management cell. Water is used for different purposes like, Drinking; Other domesticated uses; Laboratories; House Keeping and Greenery. For all the uses, ANITS depends upon ground water only as there was no public supply facility.

ANITS taps around 40 KLD of water from 6 bore wells, and has an installed capacity of 40 KLD above ground storage tanks. The mean distribution of the water for different uses is as follows:

No.	Purpose	Quantity (KLD)	(% Total)
1	Drinking	6	15
2	Other Domestic Uses	14	35
3	Laboratories & Other facilities	18	45
4	Greenery	2	5

On the whole, the drinking water availability is at 1.2 litres/head and 99 % of the campus population stays in the campus for less than 8 hours, the drinking water availability is reasonably good compared to the standard of 5 litres/head/24hrs. The ANITS has a R.O. Plant with an installed capacity of 6000 litres/day, and through which Reject water of 10000 litres/day will be generated. More than a half of which is used for floor washes and the remaining for the greenery. The RO plant water also is used by neighboring sister institution of the ANITS group.

3. ENERGY:

ANITS is one of the few institutions in India to have pioneered in the energy conservation and use of renewable energy sources. Basically it uses three types of Energy sources: (1) Electricity from the Public supply and (2) Electricity from the Own Solar plants and (3) Diesel (HSD).

The Institute during the audit year has consumed 2867/day units with a mean of 87194 units per month. However, the monthly variations were very high and ranged from a low of 43766 units in January to a high of 120240 units in September. From September to January, the consumption decreased gradually, despite the fact that the period may have peak academic activity. This indicates that the energy efficiency can be enhanced further in its use.

The declined power consumption from September to January indicates could be due to reduced use of Air conditioners. The Institution has a total of 332 air conditioners together have a cooling capacity of 500 tons. The illumination and air circulation in the facilities needed examination.

On the whole, the per capita electricity consumption in the institute is around **219 units/annum**, which is reasonably good in Educational Institutions.

The Institute has 450 KVA solar power generation systems with 1364 panels installed and is connected to the grid. Therefore, Energy units consumed from the public supply are exclusive of this power. Thus, addition of this power, accounts for a per capita production of 19 units/annum.

The second major use sector for energy is Transportation sector of the Institute. On all working days, the Institute's fleet of Buses and vehicles ply a part of the campus population. The audit results indicate, the Institute's transportation by buses covers a distance ranging from 28400 km/month to 65822 km/month, with a mean of 44946 km/month. The transportation consumption of oil ranges from 6600 litres/month to 15380 litres/month, with a mean of 11483 litres/month. Another 884 litres/month of HSD is consumed by administrative vehicles. Thus, the institution transportation covers around 35% of the campus population. The remaining 65% attend by various means, like, public transport (16%), private hired transport vehicles mostly 3 wheeler rickshaw (27%) vehicles, and about 8% of the population uses their own vehicles as was revealed from the rapid survey.

By maximizing the entropy of the transportation data, it is estimated that all the travel trips of the campus population had a per capita HSD consumption was arrived at 83.82 liters/annum.

ANITS also uses LPG fuel for its hostel messes and in some laboratories also. The evidences revealed that the annual consumption of LPG in all the facilities for the year 2019-2020 was 560 kg.

On the whole, during the year 2019-2020, the ANITS has CO₂ emission of 867 tons from use of electricity, and 356 tons from HSD Oil consumption, and 1.7 tons from LPG consumptions. Thus from the three major sources of energy, around 1224 tons of CO₂ emissions were released. However, by way of solar power generation of 93960 kWh, about 86 tons of CO₂-e could be saved or mitigated.

4. WASTES GENERATION:

The wastes generated from academic and administrative divisions only could be taken in to account, as the total institution could not be covered for certain limitations during this first audit. The wastes generated from the academic and administrative divisions are characterized into

- (a) Wet Waste;
- (b) Paper & Board waste;
- (c) Metallic waste;
- (d) Plastic Waste;
- (e) Battery waste
- (f) E-waste.

The waste generated from the two divisions, from a sampling of 1 month is presented below:

#	Waste Type	Sources	Qty	Disposal
	Wet Waste	Dining Halls & Messes	60 kg/day	Compost
	Paper & Board	Administrative & Academic	4.7 kg/day	Authorized Vendors
	Metallic	All	0.21 kg/day	Authorized Vendors
	Plastic	All	0.36 kg/day	Authorized Vendors
	E-waste	All	0.2 kg/day	Authorized Vendors

The waste management is one area where the institution is focusing on application 5 R's principle so as to enable the young learners for innovations. The Institution has initiated several good initiatives in the field of solid waste management. Within each building or facility, at all common places, at convenient points, semi-closed dust/waste bins were placed to dispose all types of dry wastes. However, for the disposal of Wet-waste, one large bin was placed near the major entries of the buildings. The wet wastes are cleared on daily basis and are transferred to the compost area. On the other hand, the dry wastes are cleared from their bins twice a week, and are transferred to the common place where they are segregated to different waste types and disposed to authorized vendors. All the students are encouraged to examine the dry waste and to take up team projects to develop innovative systems for the use of such wastes or their minimization.

5 ECOLOGICAL ACTIVITIES

Environmental and Sustainability Initiatives

ANITS, to realize its *Vision* of making its campus a **Carbon Neutral** campus and also to empower its students and employees in addressing the environmental and sustainability challenges of the nation, introduced several activities to create awareness and educational activities. These activities are generally taken up at the department level, while some activities on certain days of international or national importance, the activities are taken up at the Institutional level.

1. SWACH ANITS:

The programme was initiated at the Institutional level and coordinated by the NSS wing of the Institution. The programme aims at training the students in the **Participatory Management of the Campus** and also creates awareness among the students on the **Swachh missions** of the country. The programme for the year was launched in **August 2019**, and continued till the end of the academic year. About 120 students (10 to 12 volunteers from each department) have participated in this programme.

2. ECO GANESHA CAMPAIGN:

Eco Ganesha Campaign is one of the regular public outreach programme of **ANITS** conducted every year with the aim of using eco-friendly idols of Ganesha, so as to protect the water bodies from pollution of hazardous chemicals.

Around the time of latter half of August 2019, prior to Ganesha Chaturdhi festival, the **Green Club (GC)** based at the Civil Engineering department, first conducts the ECO friendly Ganesh Idol Competition amongst students, and promote producing chemical free and easily water submersible idols of Ganesha in good numbers.

In the second step, these idols will be distributed among the students and employees of ANITS. Finally, the students will distribute the idols through a campaign for Eco-friendly Ganesha at the nearby village, Thagarapuvalasa; and also at different places where ANITS students are residing. Later, at the end of the event, Principal Prof T.V Hanumantha Rao, will participate and distribute the Best Idol Making Students as a token of appreciation.



3. SAVE THE BEACHES:

ANITS, as part of its environmental initiatives organizes *World Ozone Day* every year on September 16th, so as to educate the young engineers on the importance of use of Ozone Depleting Substances in various technologies and gadgets. The programme is conducted at the Institute level. As a part of the programme, a public outreach campaign also is conducted at a prominent public place in the

city. On 18th September, 2019, a campaign was undertaken for the Beach users or visitors of the city to make them aware of using the beaches in an environmental friendly way. In this context, ANITS students have organized a Beach Cleaning programme by collecting waste and debris for a stretch of 2 km length of beach stretch at Rushikonda beach, Visakhapatnam.

4. VANAM MANAM

VANAM MANAM is a plantation program conducted every year by ANITS supporting the state's mission of "**Vana Mahotsava**" during the 1st week of October. During this year (2019-2020) ANITS has designed the programme to plant fruit bearing trees and other species that attract birds and other lower animals to the campus. About 150 students from all the departments and faculty have participated in the programme and planted species like, Guava, pomegranate, Bur flower in and around the campus. The programme was led by Senior faculty members, Ms. P.V.R. Sravya, Mr. J. Harshavardhan Reddy and Mr. C.H. Srinivas.



Besides these special events, the students have several assignment models built in their curriculum modules, as was also recommended by the AICTE's

Environmental Policy, and were presented before the audit team. However, the audit team recommended the assessment of these in the next year's audit programme, as they need to be first approved by the concerned academic body.

V AUDIT RECOMMENDATIONS

- ANITS by the time the next Audit is initiated should review and revise its environmental policy, to incorporate updates of the nation's policies. The new policy will be the basis of the next green audit for the year 2020 - 2021.
- The audit team, appreciates the well designed layout planning of the institute, ensuring 38 % of the land area under open category uses. However, the utilization of the open category lands need to be further maximized and documented.
- Although the greenery is good in terms of the extent and numbers, effective planning can enhance, the diversity, productivity and sequester more carbon, so as to realize the objective of making the campus C-neutral.
- Water management is very good, and needs appreciation of using huge amounts of R.O reject water for greenery and floor washes. However, the audit team recommends for the focus on enhancing rain waters harvesting from roof tops and through percolation pits.
- The Auditors appreciate the Management for replacing most electrical lights with energy efficient (LED) systems; generation of Solar power and reduced use of air-conditioning systems. However, the energy use from transport system can be improved significantly. Focus is to be made that the Institute buses should achieve 5 km/l from the present mean of 4.27 km/l.
- The Institute can further enhance its Solar Power production. Presently, the

solar power accounts for around 10% of the total power consumption. Considering the present annual expenditure of Rs. 90 lakhs/annum, the institute can plan for a 1 MW solar power plant, and can not only realize the investment in 5 years, but also can make the campus Carbon neutral.

- Although the waste management is in places, it needs more documentation of wastes related to metal plastic, battery and E wastes generated and disposed.



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PRAGNANAM BRAHMA
Help us to assist you to develop green India.

ANITS