



# Adikavi Nannaya University

*Green Audit, Energy and Environment Report*

**Academic Year 2017 – 18**



**Submitted  
March, 2018**



# Green Audit Report



## CERTIFICATE

The report on the Green, Energy and Environment audit of Adikavi Nannaya University is submitted to the authorities concerned for the year 2017 – 18.


The study is reported under three heads:

- Environmental audit
- Energy audit
- Waste management audit

The audit mainly focused on green indicators such as Environmental audit – campus greening; biodiversity, water, energy, waste management practices in all the three campuses of the University viz., the main campus at Rajahmundry, the MSN campus at Kakinada and the Tadepalligudem campus.

The methodology included physical inspection, review with the respective departments / offices and interviewing the in-charges; by associating with the Internal Green Audit Committee.

The observations were noted and documented; and the requisite recommendations were proposed for implementation and execution as per the feasibility of the University.

  
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# Green Audit Report

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# Green Audit Report

## TABLE OF CONTENTS

<b>S. No.</b>	<b>CONTENT</b>	<b>PAGE NUMBER</b>
1	Introduction	4-8
1.1	Scope of Green Audit	9-10
2	About the University	10-19
2.1	Methodology	19-20
2.1.1	Environment	20-22
2.1.2	Water	22-23
2.1.3	Energy	23-24
2.1.4	Waste	25
2.1.4.1	Effluent	25
2.1.4.2	Sewage	25-26
2.1.4.3	Solid waste	26-27
2.1.4.4	E-waste	27-28
2.1.5	Other Environmental Initiatives	28
2.1.6	Institutional Carbon Footprinting	29-30
3	About the MSN Kakinada Campus	31-32
3.1	Action Plan	32-33
3.1.1	Environment	33
3.1.2	Water	33-34
3.1.3	Energy	34-35
3.1.4	Waste	35
3.1.4.1	Effluent	35
3.1.4.2	Solid waste	35-36
3.1.4.3	E-waste	36
4	About Tadepalligudem Campus	37-40
4.1	Action Plan	40
4.1.1	Environment	41-42
4.1.2	Water	42
4.1.3	Energy	42-43
4.1.4	Waste	43
4.1.4.1	Effluent	43-44
4.1.4.2	Solid waste	44
4.1.4.3	E-waste	44-45
4.1.5	Health audit	45
4.1.6	Carbon neutrality	45



# Green Audit Report

## 1. INTRODUCTION

Human development over time has been creating adverse effects on the biophysical environment. Overexploitation and commercialization of Natural Resources, the growing trend of lifestyle changes in the scenario of globalization resulted in the climate change, global warming and irreversible loss of biodiversity and its environment. The concerted efforts of the stakeholder nations in world conventions on climate change and environment concur to mitigate and reduce the rate of pollution and extinction. Measures for sustainable development plans are underway by the Governments of the World Nations. The human race has become sensitive about these global issues, uniting to make the Planet Earth hospitable and sustainable for posterity.

A step towards this by Government of India is the Swachh Bharat Abhiyan, making every individual responsible for environmental protection. The University Grants Commission – UGC, has made the mission ‘Green Campus Clean Campus’ mandatory in the Higher Educational Institutions to encourage ecofriendly and environmentally safe practices.

The term GREEN can be an acronymised for the phrase – Global Readiness to Ensure Ecological Neutrality. Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organisations of all kinds now recognise the importance of environmental matters and accept that their environmental performance will be scrutinised by a wide range of interested parties. Environmental auditing is used to



# Green Audit Report

- Investigate
- Understand
- Identify

These are used to help improve existing human activities, with the aim of reducing the adverse effects of these activities on the environment.

An environmental auditor will study an organization's environmental effects in a systematic and documented manner and will produce an environmental audit report. There are many reasons for undertaking an environmental audit, which include issues such as environmental legislation and pressure from customers.

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. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As



# Green Audit Report

environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

## **Need of Green auditing:**

Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our processes are consuming more than required resources? Whether we are handling waste carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment.

## **Goals of Green audit:**

University has conducted a green audit with specific goals as:

1. Identification and documentation of green practices followed by university.
2. Identify strength and weakness in green practices.
3. Conduct a survey to know the ground reality about green practices.
4. Analyze and suggest solution for problems identified from survey.



## Green Audit Report

5. Assess facility of different types of waste management.
6. Increase environmental awareness throughout campus.
7. Identify and assess environmental risk.
8. Motivates staff for optimized sustainable use of available resources.
9. The long term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issue before they become problem.

### **Objectives of Green audit:**

1. To examine the current practices which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyze significant environmental issues.
3. Setup goal, vision and mission for Green practices in campus.
4. Establish and implement Environmental Management in various departments.
5. Continuous assessment for betterment in performance in green practices and its evaluation.
6. To prepare an Environmental Statement Report on green practices followed by different departments, support services and administration building.

### **NAAC criteria VII Environmental Consciousness:**





## Green Audit Report

Universities are playing a key role in development of human resources worldwide. Higher education institutes campus run various activities with aim to percolate the knowledge along with practical dimension among the society. Likewise different technological problems higher education institutes also try to give solution for issues related to environment. Different types of evolutionary methods are used to assess the problem concerning environment. It includes Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Carbon Footprint Mapping, Green audit etc.

National Assessment and Accreditation Council (NAAC) which is a self-governing organization that declares the institutions as Grade according to the scores assigned at the time of accreditation of the institution. Green Audit has become mandatory procedure for educational institutes under Criterion VII of NAAC. The intention of green audit is to upgrade the environmental condition inside and around the institution. It is performed by considering environmental parameters like water and wastewater accounting, energy conservation, waste management, air, noise monitoring etc. for making the institution eco-friendlier.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring natural resources in students. Many environmental activities like plantation and nurturing saplings and trees, Cleanliness drives, Bird watching camps, No vehicle day, Rain water harvesting, etc. will make the students good citizen of the country. Through Green Audit, higher educational institutions can ensure that they contribute towards the reduction of Global warming through Carbon Footprint reduction measures



# Green Audit Report

## 1.1 SCOPE OF GREEN AUDIT

**Water Audit:** Evaluating the raw water intake and requirement and determining the available sources and facilities for water treatment and re-charge. Water harvesting is one of the best techniques that can be adopted by simply capturing and storing the water and using it at the time of scarcity and also various facilities to recharge ground water.

**Waste Disposal Audit:** The waste disposable measures associated to hazardous wastes, recyclable waste and e-waste management are reviewed. Diagnosis of the prevailing waste disposal policies and suggest the best way to combat the problems.

**Energy Audit:** It deals with the energy conservation and methods to reduce its consumption and the related pollution. This also deals with production and availability of alternative energy sources. Study the energy saving methods adopted and find whether these methods are using the energy in a conservative way or not.

**Environmental Quality Audit:** It analyzes the air quality, noise level and the programs undertaken by the institute for plantation. The Green Belt need to be maintained to reduce the pollution level by decreasing the Carbon dioxide level.

**Health Audit:** It analyzes the occupational hazards and safety measures undertaken within the institute. Advocate the college initiative to encourage students to protect environment and conserve it through plantations.

**Using Renewable Energy:** Resources which can be replenished should be used such as rain, sunlight, wind, tides, etc. These resources are more advantageous as they cause no pollution.



# Green Audit Report

**Carbon Neutrality:** It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon neutrality is maintained. It is necessary to know how much the organization is contributing towards the sustainable development and environmental protection in order to make the campus more environmental friendly.

## 2. ABOUT THE UNIVERSITY



Adikavi Nannaya University was established on 22nd April 2006, by an Act of the Andhra Pradesh State Legislative Assembly to meet the higher education needs of



## Green Audit Report

East & West Godavari districts. It is an affiliating residential university with territorial jurisdiction over East & West Godavari districts of Andhra Pradesh. It is named after the first poet of Telugu culture, Nannaya (the eleventh century translator of Mahabharata from Sanskrit to Telugu), the court poet of Rajah RajahNarendra, (the Eastern Chalukya King). The University was established to fulfil the cherished dream of the people of this region, on the sacred banks of River Godavari



The University moved from Government College(A), Rajamahendravaram, to an own campus in 2014. It consists of four colleges in main campus namely - University College of Arts & Commerce, University College of Engineering, University College of Education and University College of Science & Technology catering to the needs of students on campus. The Adikavi Nannaya University is having extension campuses at Kakinada (EG District) and Tadepalligudem (WG District). As far as the number of affiliated colleges are concerned, this University stands tall being the largest in the state of Andhra Pradesh, affiliating nearly 450 colleges. A



## Green Audit Report

dynamic semester-based courseware is created by integrating the traditional syllabus with the latest trends across disciplines to suit the current industry, employability and professional requirements. Choice Based Credit System(CBCS) is being implemented for all UG, PG and Professional Courses across the University. The University is on the path to establish a strong research base and culture of innovation. The University has highly qualified faculty in their respective fields of expertise. A large number of national and international conferences, seminars and workshops are organized. Such events provide a variety of experiences to the students and inculcate skills such as leadership and team spirit apart from the academic enhancement, networking, mentoring much helpful in their career. There is an active interaction between faculty and students in the campus paving a strong path for enhancement of overall development of the learners. Some of the faculty members are very active in the research work and publishing in good impact journals.

Spread across a sprawling 97 acres of land, the ambience of pristine campus projects a vibrant atmosphere, with a moderate and pleasant climate throughout the year. Its location has good connectivity with air, rail and road, attracting students across Andhra Pradesh / India and International student fraternity.

### **Vision & Mission:**

This University aims to combine the pristine cultural ethos and the contemporary demands of educational excellence in its vision. To uphold the simple but profound motto, Sarvatra Vidyaya Vardhate Praja - Expansive education leads to enrichment of the people, Adikavi Nannaya University will nurture its students as the citizens of the globe on the rich fundamentals of Indian culture while respecting all its diverse



# Green Audit Report

ideas. Combining class room and field/lab learning process, nurtured through academia industry relationship, the student shall embark on a journey of intellectual transformation. The University is committed to achieve its mission through outstanding research and scholarship, education and practice by free exchange of ideas with the support of its ethical, interdependent, diverse community of faculty, staff, students and alumni.

## **CAMPUS INFRASTRUCTURE**





# Green Audit Report

## FACILITIES

### Library:

The University has a Central library building named after our Nation's Socio-Political reformer, Babasaheb Dr. Bhimrao Ambedkar. It started functioning in 2006 with a minimum collection of 100 books with open access system. At present the library has about 11882 books and with the introduction of new courses purchase of additional books is underway. It also subscribes journals required for all the subjects. The library provides competitive books so that the students can make use of them for their job opportunities

TOFEL Cassettes in audio form and CDs along with GRE books are available in the reference section. Besides, a good collection of CDs for various departments are also available. The Unique facility in the library is it is having the last printed edition of Oxford English Dictionary (OED) in 20 Volumes.





# Green Audit Report

## **TIMINGS:**

✓ Working days 08:00 AM to 8:00 PM.

✓ Second Saturdays & Sundays 10:00 AM to 01:00 PM.

✓ Summer Vacations 08:00 AM to 01:00 PM.

✓ The Library remains closed on Public holidays

✓ Circulation Counter (issue/return) Works from 10:00 AM to 05:30 PM

## **Hostels**

### **Men's Hostel**



A building comprising 40 rooms accommodates the students of Arts, Science & Technology and Engineering colleges with a well-spaced kitchen, fully ventilated,





## Green Audit Report

well-furnished dining hall. An RO plant provides for the drinking water needs of the resident students

### **Women's Hostel**



A three storied rectangular building with the resident rooms on all four sides of a central court yard, accommodates the women students of the Arts, Science & Technology and Engineering colleges. Each floor has two clusters of Rest rooms and Wash rooms that are well maintained.

A resident warden is also designated to take care of day to day monitoring and any emergencies during the nights.

A spacious kitchen is attached to storage and utility areas which are well kept. The neatness of the serving platforms is regularly monitored. The big dining hall can accommodate 100 - 200 members in a single serve.

### **International Guest House/Hostel**



## Green Audit Report



A three floored building with 12 – 14 well furnished rooms in each floor and a dining hall on the first and second floors is allocated for the visitors / guests / students. A canteen in the adjacent building caters to the hospitality needs of the guests

### **Sports**





## Green Audit Report

The sports grounds have courts for volley ball, basketball, cricket nets for outdoor sports, table tennis and carom board for indoor games

2 hours per week of Sports is allotted in the Time Table for every course in the University

Inter Mural competitions are conducted regularly for students

Competitions for faculty are also conducted once in a year on special occasions

Women faculty participate in competitions conducted on the occasion of Women's Day every year

### **Health Centre**

A building for Health Centre was donated by Mrs and Dr. Sunkara Venkateswara Rao, named after their late son as Dr. Vinay Sunkara Memorial Health Centre. It has been functional since April,2015 with one visiting male Doctor and a female Nurse during the day hours. This building is provided with a Doctor's consultation room with attached toilet; a room with attached toilet for the Nurse; a room for medicines; Two sick rooms with attached toilets – one each for the male and female patients; and two wards with one toilet each – one each for male and female patients; and one OP (outpatient) room. The Health Centre is equipped with the BP apparatus; Stethoscope, weighing machine, nebulizer machine, sugar testing kit and a thermometer. Treatments for minor sicknesses viz., fever, cold, nausea / vomiting, diarrhea / dysentery, asthma, BP and diabetes are being provided at the Centre. The medical care for Inpatients rarely arises as the student / patient is immediately taken to the GSL Hospital across the road for any major medical interventions.



# Green Audit Report



## 2.1 METHODOLOGY

This audit mainly focused on green indicators such as Biodiversity (Flora and fauna) – under Environmental audit, water, energy, and waste management practices, carbon footprint. The methodology includes physical inspection, review with the respective departments / offices, interviewing the in charges, and proposing the necessary recommendations. The study is reported under the following heads:

- I. ENVIRONMENTAL AUDIT (GO GREEN)**
- II. WATER AUDIT**
- III. ENERGY AUDIT**
- IV. WASTE MANAGEMENT AUDIT**

### **Environmental Audit**

Maintaining a pleasant and clean environment is the foundation for a healthy atmosphere in the campus and well-being of student and teaching community. The environmental audit focuses on

- a) What factors can improve the biodiversity in and around the campus



# Green Audit Report

- b) Does the infrastructure facilities such as parking facility affect the water drainage and so the biodiversity?
- c) Does the campus have initiatives to improve carbon neutrality.
- d) Monitoring of the increase of number of trees in the campus
- e) Arranging awareness programs for the staff and students of the college

## **Energy Audit**

In the energy Audit, monitoring of the monthly electrical energy usage will help in understanding where electricity can be saved in the campus and explore scope for application of alternative energy.

## **Waste management Audit**

Hazardous waste is waste that is likely to be a threat to health or the environment. In the campus this audit deserves primary attention as many harmful chemical wastes are produced from the laboratories of various science departments and also solid waste that is generated from the Hostels, Canteen, the scrap and junk from administrative sections.

E-waste generated and its management is also a major aspect of the waste audit.

### **2.1.1 Environment:**

The sprawling 97 acres of campus away from the urban territory, proximal to the reserve forest area resembles the wilderness of the yesteryears. Any construction



## Green Audit Report

activities little disturbed the wild habitat which is a dry deciduous scrubland with its distinct flora and fauna.

Several species of Snakes are reported moving freely in the grounds; star backed Turtle, a threatened species in India, was rescued recently and handed over to the custody of Forest wildlife authorities; several seasonal visiting birds have been inventoried; monitor lizard spotted in the UCST college building, not to mention the mongoose and other wild animals

The vegetation is a mixed community of herbs, shrubs and trees (wild and planted) in a harmonious balance with the prevailing climatic conditions. The composition of plant community exhibits seasonal variations and 236 species with 182 genera belonging to 62 different families were recorded in total from all seasons of the year. 210 plant species are of dicots and 26 varieties belong to the monocot families. Amongst these 236 types, 217 species are naturally growing which include 20 trees; and 19 are planted for avenue and ornamental purpose. Major component is herbaceous scrubs, some with medicinal value and others with ecological functions. 6 of the plant species are of the vulnerable category of threat with medicinal values found growing naturally in the campus. 12 wild relatives of crop plants, 34 wild edible leafy vegetables have been identified.

The university took up large scale environmental protection / Swachchata activities, through NSS and mass plantation of more than 2000 plants, along the boundaries of the campus comprising of *Butea monosperma*, *Terminalia arjuna*, *Pterocarpus santalinus*, *Tectona grandis*; with individual sectors identified – to be maintained by



# Green Audit Report

the staff and students of each Department of UCAC, UCST, UCE and College of Education.

In order to inculcate the responsibility and respect for nature, one period per week is allotted for swachchata activity in the Time Table for which they would be given 10 marks added in the Internal assessment.

## **Recommendations**

Avenue plantations at present are of 2-3 varieties viz., Neem, *Ficus* and *Spathodia* species. Plantations of local varieties for reducing pollution, high oxygen production, shade giving and insect and bird friendly is suggested in the remaining pathways.

Future construction activities in the campus should ensure the wilderness is little disturbed, to protect the rare, threatened, vulnerable species, the land races, the wild relatives of plants, and the related faunal species this habitat supports.

The landscaping and beautification plantations should include only endemic, local pollinator friendly, non-invasive, and non-exotic species

### **2.1.2 Water**

#### **Sources**

The University is presently having 3 hostels accommodating around 1200 students. The campus has an administrative building and college building with staff of around 500 members. Students attending the classes in the campus daily would be over 2000.



## Green Audit Report

The University consists of 2 bore wells each with 20 hp pumping motors, which is the primary source of water supply. Raw water of nearly 2 lakh liters is utilized for daily needs in the campus.

All the buildings of the University are installed with RO plants for pure drinking water. The water quality is periodically tested in the laboratory as part of their curriculum in terms of a few chemical constituents and Dissolved O<sub>2</sub>.

### WATER HARVESTING:

A water harvesting pond spread over 2 acres stores water up to 2 crore liters. This water is utilized for construction activities and watering plants.

### **Recommendations**

Rooftop rainwater harvesting for drinking by advanced water treatments and sanitary purposes

Specific efforts for conservation of fresh water through auto water taps based on occupancy sensing mechanism.

### **2.1.3 Energy**

#### **Energy Source**

The University is presently receiving a power load of 100 KVA from the APEPDCL. A 40 KVAR Kirloskar diesel generator is used in the administrative block as a backup during power breakdowns.





# Green Audit Report

## ENERGY SAVING METHODS ADOPTED:

The buildings were designed in such a way that the rooms are well ventilated for abundant light and free passage of air, having wide Corridors and large windows and door sizes appropriate for proper passage, air circulation and ventilation. Hence the need for Air-Conditioners arises only during the peak summer days – normally closed for vacation. Use of electric bulbs is redundant during the day except on cloudy days saving an enormous quantity of power consumption. The day to day energy utilized in the class rooms would be primarily for the fans, any electrical laboratory equipment, computers and so on.

The newly constructed buildings – UCST and UCE - are provided with LED lights to reduce the power consumption which in turn saves the energy consumption.

Whatever few Air Conditioners were purchased are of 5-star rating for power saving.

## **Recommendations**

Periodic energy audits can be planned to have enough data on savings and contribution through use of solar /green energy.

The staff and students can be sensitized towards energy saving methods and educate them to switch off lights and fans when not in use and have posters of save energy stickers placed in all class rooms.

Occupancy sensors can be planned to avoid manual intervention in shutting off and starting on the lighting systems in various rooms.



# Green Audit Report

## **2.1.4 Waste**

### **2.1.4.1 Effluent**

The University has eight buildings – The administrative block, a CPW constructed building; College of Science and Technology; a Central Library Building; Boys Hostel; Girls Hostel; Dr. Vinay Sunkara Memorial Health Centre; International Guest House; Amenities Centre housing the Bank and Canteen. A building is under construction for Convention Centre.

The drainages for each of these buildings are connected to Septic Tanks of dimensions 12'L x 6'W x 10'D. One adjoining the Administrative building; Two tanks for UCST block; Two for BR Ambedkar Central Library; One tank is shared between the Amenities Centre and the International Guest House; Two tanks cater to the Girls Hostel; One tank for the Boys Hostel; and one tank for the Health Centre. Rooftop rainwater drainages are open canals connecting to these Septic Tanks. Laboratory waste waters and other drainages are all connected to the respective tanks through PVC pipes.

### **Recommendations**

Since the waste water quantities are very minimal, as of now no specific recommendations are required.

The kitchen effluent water can be utilized by maintaining a kitchen garden in the Hostels.

### **2.1.4.2 Sewage**



# Green Audit Report

## **Domestic sewage management**

Domestic sewage is generated through the use of water for sanitary purposes. The sewage generated after the use is connected to the respective Septic tanks, with majority collection from the Hostels.

## **Recommendations**

Based on the consumption of water for each day and the daily water supply quantities domestic sewage can be quantified for further water conservation purpose.

Specific water audit can be conducted to know the water inflow and out flow along with the losses, leakages, wastages etc. so as to plan action for water conservation.

### **2.1.4.3 Solid waste**

Major sources of solid waste are the kitchen wastes in the Hostels, Canteen, Medical wastes at the Health Centre (cotton, gauze, syringes, injections, vials, saline bottles, I V sets, crepe bandages etc) and office stationary wastes.

The food waste dumped in the backyard with no specific measure for its recycling and processing.

The medical waste is dumped in the vacant grounds in the vicinity of the Health Centre

Stationary waste from different sections of administrative office is not remarkable and is yet to be disposed.



# Green Audit Report

## **Recommendations**

Quantification of every day food in both the hostels and canteen if displayed in the premises may educate the residents / customers, towards judicious consumption of food.

The leftover food can be handed over to an Old age home / Orphanage is suggested to reduce the wastage and the costs related both economic and environmental

The kitchen wastes from the hostels can be used for vermicomposting and grow kitchen garden for both economic and ecological benefits

Measures for proper disposal of the medical wastes is urgently recommended and a tie-up with the medical waste collectors of GSL Hospital is suggested.

### **2.1.4.4 E-Waste**

#### **E-waste management**

Since the organization has moved to the campus only two – three years back, all the electronic goods are new and in good working condition. It is well established and equipped with the necessary and up-to-date electronic infrastructure, the e-waste generation is very minimal, hence the anticipated e-waste disposal strategies are underway.

#### **Recommendation**

An authorized vendor be identified for servicing and disposal of e-waste that will be generated.



## Green Audit Report

Purchase of electronic items in future to be done with the buyback assurance so as to meet the e-waste disposal requirements of the legislation. E-waste after generation to be segregated and kept separately for disposal in systematic way through the authorized vendors.

Periodic inspections and maintenance for optimizing the E- Goods functioning is suggested

### **2.1.5 Other Environmental Initiatives**

Plantation activities at the onset of monsoons is practiced adding to the existing Avenue plantations.

Invited Lectures and Special Talks on the occasion of World Environment Day, International Day of Biological Diversity, Earth Day etc, to motivate the young minds towards environment protection, think of reducing pollution.

Regular study tours for natural vegetation studies viz., Maredumilli, Rampa, Talakona, Ooty, BSI – Coimbatore, National Parks, Biosphere reserves, Reserve forests, taken up to sensitize the students about the treasures of Nature, the impact of human activities on the destruction of Nature

Exposure visits to farm lands to understand the impact of chemicals on the soil, water, air and microbial and faunal diversity; impact of Polavaram project on the local flora and fauna, the endemic tribes, the economics of the projects etc.

Conducted the Government program - Vanam manam with support from the Forest Department of East Godavari District.



# Green Audit Report

## 2.1.6 Institutional Carbon Foot printing

Carbon emissions are a significant cause of climate change. Human activities are responsible for increase in greenhouse gases in the atmosphere. The largest source of greenhouse gas emissions from human activities is from burning fossil fuels for electricity, heat, and transportation.

Carbon Footprint (CF), as an indicator of climate performance, helps identify major GHG emission sources & potential areas for improvement. It has been introduced as a tool to guide the relevant emission cuts and verifications that will facilitate the understanding of the risk of global warming at the very first stage.

According to Carbon Trust (2007), “Carbon Footprint is defined as a measurement of the total GHG emissions caused directly and indirectly by an individual, an organization, event or product and is expressed as a carbon dioxide equivalent (CO<sub>2</sub>e)”. An organizational carbon footprint measures the GHG emissions from all the activities across the organization, including energy used in buildings, fugitive emissions and organization’s vehicles. Besides quantifying organization’s total GHG impact, a Carbon footprint analysis will provide the organization with a comprehensive GHG inventory, allowing it to identify and target reductions from its major emissions sources. Measuring it in this way enables us to address the climate change challenge in a holistic way that does not simply shift the burden from one natural system to another. In fact, the climate problem emerges because the planet does not have enough bio capacity to neutralize all the carbon dioxide from fossil fuel and provide for all other demands.



## *Green Audit Report*

The GHGs expected to be released in the campus with newly installed infrastructure with good rated electronic goods; very few vehicles, cooking stoves can be negligible and remediated by the green cover in the campus. What little CO<sub>2</sub> is produced will be utilized by the plants for the photosynthesis, in the process releasing large quantities of O<sub>2</sub> and water vapour. This probably is the reason for the temperatures in the campus to be less by 2°C when compared to the city of Rajahmundry.

### **Recommendations**

With large scale expansion of the University foreseen, a scientific evaluation of the carbon footprint of the campus is suggested.



# Green Audit Report

## Adikavi Nannaya University MSN Campus, Kakinada



### 3. ABOUT THE CAMPUS

The Adikavi Nannaya University MSN Campus, (Erstwhile Andhra University MSN Campus) Kakinada lies on the East coast in the East Godavari District, Andhra Pradesh, India. The campus has been carefully nurtured in academic and service activities since its establishment in November 1977. The Campus is ideally located in between 213 National Highway and Kakinada Port – Samalkot ADB Road in a 50.93 acres site at Thimmapuram village. The Campus is at a distance of nine kilometers from Kakinada Town Railway Station. The environment and facilities at the Campus are very conducive to learning. The administrative control of this campus has been transferred to Adikavi Nannaya University, Rajahmundry vide. G.O. Ms. No. 19 Dated 06.04.2017





## Green Audit Report

The Andhra University, Visakhapatnam started the Andhra University Post Graduate Courses, in November 1977 at the erstwhile Pithapur Rajah's Government College hostel buildings, Suryaraopet, Kakinada to cater to the educational needs of the people of the Godavari districts. At the beginning the University introduced three courses viz., M.A., in English, and M.A., in Politics and Public Administration. Sri. Malladi Satyalinga Naikar Charities donated an extent of Ac 40.38 cents of land to the Centre in Thimmapuram (village), Kakinada Rural Mandal. A Building with 22,053 sft was constructed in the said land in the year 1989. The A.U.P.G. Centre was shifted to its new building in June 1993 with a new caption as Andhra University M.S.Naicker P.G.Center.

The sprawling campus spread over 50.93 acres has play grounds, Indoor stadium, Badminton Academy, Spacious Auditorium, language Lab, Computer Lab and other laboratories, Seminar hall, Net Centre, Central library, Hostels, e-classrooms, Wi-Fi campus and other infrastructural facilities useful for the learners. The institution has a consistent track record of good results along with notable performance in extra-curricular and co-curricular activities like Games and Sports, NSS, Literary and Cultural. Different cells and clubs like – Women Empowerment Cell, Women Entrepreneurship Cell, Career Guidance and Placement Cell, Grievance Redressal Cell. etc., are functioning with the active involvement of the students.

The Campus has also adopted “Green Campus” for environmental conservation and protection.

### **3.1 Action Plan**



# Green Audit Report

The Green Audit Conducted at Adikavi Nannaya University MSN Campus, Kakinada by the Audit team is based on the following aspects.

- I. Environmental Audit (Go Green)
- II. Water Audit
- III. Energy Audit
- IV. Waste management Audit

## 3.1.1 Environment

Maintaining a pleasant and clean environment is the foundation for a healthy atmosphere in the campus and well-being of student and teaching community. The campus is filled with variety of a number of Plants and tree species (*Mangifera indica* (Mango), *Borassus aethiopum* (African Fan Palm), *Cocos nucifera* (coconut), *Polyalthia longifolia* (Asoka)) contributing for the green and healthy environment. Due to the presence of large varieties of plants a number of insects and birds visit the campus every day.

Plantation and cleaning activities are part of the time table under NSS program every week.

## Recommendations

It is recommended to continue the maintenance of the greenery in the campus. Also suggested to go for plantation of endemic plants and monitoring of the flora and fauna of the campus at regular intervals.

## 3.1.2 Water



## Green Audit Report

The main source of water supply for the institute is from the bore wells. The water quantity required per day is around 4000 liters. The Institute has installed the Water harvesting for about 25000 liters capacity. The drinking water is provided through a 500 liters per day RO water plant and thereafter to the dispensers at various locations for ease of access to the students and staff. The drinking water is periodically tested from the laboratory and ensured its potability for drinking purpose.

### **Recommendations**

Further to the provisions of water in the institution, methods can be applied to use the rooftop rainwater harvesting water for drinking and sanitary purposes by advanced water treatments.

Specific efforts for conservation of fresh water through auto water taps based on occupancy sensing mechanism.

Separate metering also can be installed for garden and domestic water consumption including ETP recycled treated effluent etc.

### **3.1.3 Energy**

APPDISCOM is the major source of electricity. 20 KW is the requirement of the institute. In terms of units, institute consumes around on an average 5000 units per month.

### **Recommendations**

Installation of LED lamps and bulbs is recommended. Periodic energy audits can be planned to have enough data on savings and contribution through use of solar /green energy.



# Green Audit Report

Occupancy sensors can be planned to avoid manual intervention in shutting off and starting on the lighting systems in various rooms.

We recommend educating all the students and staff to switch off lights and fans when not in use and save energy stickers to place in all rooms.

## **3.1.4 Waste**

### **3.1.4.1 Effluent**

Sewage is generated through the use of water for sanitary purposes. The sewage generated after the use is connected to the municipal sewer lines through the underground sewer lines.

Laboratory waste water generated around 200 liters per day is treated/diluted and discharged in Local Municipal sewage channels.

## **Recommendations**

Based on the consumption of water for each day and the daily water supply quantities domestic sewage can be quantified for further water conservation purpose.

Specific water audit can be conducted to know the water inflow and out flow along with the losses, leakages, wastages etc. so as to plan action for water conservation.

### **3.1.4.2 Solid waste**

Major sources of solid waste are from the canteen and stationary wastes. Bulk Stationary waste is segregated into non-recyclable and recyclable. Non-recyclable



# Green Audit Report

waste is burned in the campus. Recyclable waste is given for recycle to paper manufacturers on exchange basis as per the volumes generated.

## **Recommendations**

Quantification of every day canteen waste can be taken up and it can also be displayed in the canteen to educate the consumers / students about the wastages and losses to the environment and human efforts.

### **3.1.4.3 E-waste**

Since the organization is well established and equipped with the necessary and up-to-date electronic infrastructure, the e-waste generation is very minimal. However, as a proactive initiative, an authorized vendor is identified for servicing and disposal of e-waste in case it is generated. Usually the contracts for electronic items are done with the buyback assurance so as to meet the e-waste disposal requirements of the legislation. E-waste after generation is segregated from other sources and kept separately identified for disposal in systematic way through the authorized vendors.

## **Recommendations**

E-waste listing and quantification in detail can be useful further to reduce the e-waste generation.



# Green Audit Report

## Adikavi Nannaya University, Tadepalligudem Campus

### 4. ABOUT THE CAMPUS



Adikavi Nannaya University, Tadepalligudem Campus, is the constituent college of Adikavi Nannaya University, located in Tadepalligudem, West Godavari District, in the state of Andhra Pradesh, India. Tadepalligudem, a peaceful trading town, well connected by rail (East Coast Grant Trunk route) and road (National Highway 16). The campus was established as Post Graduate Centre of Andhra University, Visakhapatnam in 2004. The sprawling twenty-acre campus is located in an academic neighborhood along with the National Institute of Technology and other reputed private Engineering Colleges. Taken over by Adikavi Nannaya university in 2017, the campus has since then been offering Chemistry, Physics and MBA at the Postgraduate level and four-year Pharmacy course at the Bachelor's



## Green Audit Report

level. All the courses have well established labs and a good collection of library books. Students and faculty have access to JSTOR and JGate, e-journal consortiums. The campus is having a ten-acre playground with good sports and games facilities. A dedicated modern halls of residence for girls is coming up on the campus. A seventy thousand square feet, modern academic complex is in advanced stage of construction exclusively for the pharmaceutical course.

### **COURSES OFFERED:**

S. No.	Courses Offered	Year of Establishment
01	Masters of Business administration	2017
02	M.Sc Organic Chemistry	2018

### **INFRASTRUCTURE AND LAB FACILITIES:**

The University has adequate physical infrastructure for post-graduation and under-graduation programme which were having separate buildings to facilitate teaching, research, extracurricular activities, and residential facility for women students and staff.

The Post-graduation programme serves with a built-up area of 26530 sqm., it has 1 lecture theatres, 9 classrooms, 2 tutorial rooms, 1 Digital Class room, many 6 laboratories, a well maintained and spacious library, a board room, an auditorium with 250 capacity, well maintained computer lab.

The Under-graduation course facilitates students with built-up area of 66000 sqm it has 5 classrooms, 2 tutorial rooms, 1 seminar hall, many 11 laboratories excluding Central Instrumentation room and Machine room, well equipped computer lab a well



## Green Audit Report

maintained and spacious library and reading room stocked with the latest reference books and textbooks is available for the pharmacy students and an auditorium with 500 capacities.

### **EXTRACURRICULAR ACTIVITIES:**

The AKNU Campus has been organizing various extracurricular activities for the overall development of students.

The Swatch Bharat Programme was launched by Prime Minister Narendra Modi with an aim to make India Clean. Aim is to provide sanitation facilities to every family including Toilets. Solid, Liquid waste disposable systems, village cleanliness and safe and adequate drinking water supply. It is significant that the prime minister himself is taking very proactive role in making the campaign a success. University campus organizes half session of every week. Entire college participated in this programme of Swatch Bharat.

The College in every academic year beginning conducts a series of awareness programmes on “Anti – Ragging” with the higher officials of police departments and creates the awareness among the students about punishable laws related to the ragging and gives a confidence to junior’s students and the laws associated with Ragging and suggested all students should be with brotherly nature irrespective of senior or junior categories.

World Environment Day was marked by planting the trees in and around our campus by our Hon’ble Vice Chancellor and Former Registrar and Special Officer for making greenery campus all around.





## Green Audit Report

Every year college celebrated Independence Day. Our Principal will host the National Flag. All teaching and Non-Teaching Staff and students are participated.

### **UNITS IN NSS/NCC:**

AKNU Campus Tadepalligudem was not yet initiated with NSS/NCC.

### **DIFFERENT CELLS AND THEIR ACTIVITIES:**

#### ***Anti-Ragging cell for each department:***

To ensure compliance as per the UGC Regulations on curbing menace of ragging in higher educational institutions, 2009, the Anti-Ragging Committee is nominated and headed by the Head of the institution, of each department and comprises of representatives as prescribed by the UGC Regulations involved in youth activities and representatives from the institute.

The committee will ensure compliance with the provisions of the Anti-ragging regulations; monitor and oversee the performance of the Anti-Ragging Squad in prevention of ragging in the institution.

### **4.1 Action Plan**

The Green Audit Conducted at Adikavi Nannaya University MSN Campus, Kakinada by the Audit team is based on the following aspects.

- I. Environmental Audit (Go Green)
- II. Water Audit
- III. Energy Audit
- IV. Waste management Audit



# Green Audit Report

## 4.1.1 Environment

The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programs organized by the authority and have become an integral part of the college.

The trees (Coconut trees, Mango trees and shrubs) of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting animal species, controlling climate by moderating the effects of the sun, rain and wind.

Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Many of the grazing animals are dependent on trees and shrubs mainly for food and shelter. A thick belt of large shady trees in the periphery of the college have found to be bringing down noise and cut down dust and storms. Our campus is situated 2Km away from traffic area, which is free from the carbon monoxide, nitrous oxide, hydrocarbons emission.

Noise pollution will be in acceptable or permissible level nearly of 50 to 40 dB (Silence zone) Thus, the college has been playing a significant role in maintaining the environment of the entire campus and its surrounding areas.

## Recommendations

The same maintenance of green cover in and around the campus is to be continued and introduction of new endemic varieties of plants is recommended as to increase



# Green Audit Report

more greenery, beauty as well as increases insect and bird visitors to the campus thus improves the biodiversity.

## **4.1.2 Water**

To cater the water requirement for the campus, two bore wells are used for the activities. The total quantity of water required for the campus is assessed for a population of students is assessed as 3000 litres per day.

For hygienic drinking water, our campus hired one RO plant nearby. In order to provide drinking water, the water plant authority will place nearly 20 cans every day in each and every floor.

## **Recommendations**

Further to the provisions of water in the institution, methods can be applied to use the rooftop rainwater harvesting water for drinking and sanitary purposes by advanced water treatments.

Specific efforts for conservation of fresh water through auto water taps based on occupancy sensing mechanism.

Separate metering also can be installed for garden and domestic water consumption including ETP recycled treated effluent etc.

## **4.1.3 Energy**

The energy utilized in the Campus for lighting, and cooling, running of laboratory instruments, water heating, appliances in office, ground water pumping, cooking and transportation provided by the state government authority.



# Green Audit Report

The alternate energy source for the operation of AKNU campus office and computer rooms is by the Inverter with 500 watts.

## **Recommendations**

Periodic energy audits can be planned to have enough data on savings and contribution through use of solar /green energy.

Installation of LED bulbs/ lamps is recommended.

Occupancy sensors can be planned to avoid manual intervention in shutting off and starting on the lighting systems in various rooms.

We recommend educating all the students and staff to switch of lights and fans when not in use and save energy stickers to place in all rooms.

### **4.1.4 Waste**

#### **4.1.4.1 Effluent**

At present in different laboratories of all science streams, following categories of chemicals are in use: Oxidizers, Oxidizing acids, Basic flammable liquids, Organic and Inorganic acids or bases, Poisons (Toxic chemicals), Water-Reactive acids and Non-Hazardous or nonregulated chemicals.

AKNU Campus is committed to manage chemical wastes produced in its practical laboratories in a safe and environmentally sound manner that complies with all applicable central and state government regulations.

Since the college has a strong commitment to protect the environment and to be abide by the regulations of the government, in next few years we plan to introduce proper “Chemical’s Waste Management Guidelines”.



## Green Audit Report

The handling and storage will be the areas where college will take adequate steps in the campus itself while disposal will be done in cooperation with a local Municipal authority. Sewage water is discharged to public Sewer.

### **Recommendations**

Specific water audit can be conducted to know the water inflow and out flow along with the losses, leakages, wastages etc. so as to plan action for water conservation.

#### **4.1.4.2 Solid waste**

Domestic Waste is given to Municipal Corporation. Two types of Waste bins are provided at campus for biodegradable and non-biodegradable waste. Incinerator is used for managing sanitary waste.

Reuse of one side printed Paper for internal communication. Five composting pits are there in campus, Reuse of one side printed Paper for internal communication.

### **Recommendations**

Quantification of every day canteen waste can be taken up and it can also be displayed in the canteen to educate the consumers / students about the wastages and losses to the environment and human efforts.

#### **4.1.4.3 E-waste**

E-waste generation is very minimal.

### **Recommendations**

E-waste after generation is recommended to segregate from other sources and kept separately identified for disposal in systematic way through the authorized vendors.



# Green Audit Report

E-waste listing and quantification in detail can be useful further to reduce the e-waste generation.

## **4.1.5 Health audit**

AKNU Campus comprising of different streams the teaching, non- teaching and students will be dealing with hazardous acids, chemicals, microbes and different equipment's for the formulations.

In Case of emergency cases, students were sent to nearby hospitals or first aid clinics nearly 2Km away from the campus through college vehicles.

## **4.1.6 Carbon neutrality**

AKNU campus Tadepalligudem achieved carbon neutrality by reducing greenhouse gases. Reduce electricity consumption, reduce transportation emissions, eliminate emissions from paper, eliminate emissions from waste, Produce Renewable Energy, and produce maximum viable energy from waste, reducing energy use through building level energy efficiency projects and energy saving actions by facility occupants.