

# ENVIRONMENT AUDIT

STUDY PERIOD (TWO YEARS) 2020-2021 AND 2021-2022

Sustainability study

## AUDIT REPORT

Studied for

The Loyola College Society's

**Andhra Loyola College (Autonomous)**

Door No. 54-16-14, Govt. Polytechnic Post,

Vijayawada - 520 008, Andhra Pradesh, India

Studied in the capacity of

An accredited & Certified Green Building Professional



Studied by

**Greenenvia**  
Solutions

Valid till **December 2023**



Hereby presents the 'Sustainability Research' about

## **A Self-sufficient Sustainable premises**

That has proved exceptional results with an amalgamation of

### **Social and Green practices**

That has helped the premises become a

### **Nearly zero water premises**

One of the premier and Andhra Pradesh's leading educational institute

## **Andhra Loyola College**

**(Autonomous)**



# Disclaimer

The Audit Team has prepared this report for **The Loyola College Society's Andhra Loyola College (Autonomous)** located at Door No. 54-16-14, Govt. Polytechnic Post, Vijayawada - 520 008, Andhra Pradesh, India based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the Hon'ble Management and College. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied or regenerated in any form.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

## Greenvio Solutions

*Developing Healthy and Sustainable Environments*

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

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## Acknowledgement

The Audit Assessment Team thanks **The Loyola College Society's Andhra Loyola College (Autonomous), Andhra Pradesh** for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to everyone from the Management.

Our heartfelt thanks to Chairperson of the entire process **Dr. G.A.P. Kishore, S.J.**, Principal for the valuable inputs.

We are also thankful to **College's Task force the faculty members** who have collected data required **Dr. G. Srinivasa Rao**, IQAC Coordinator; **Sri. G. M. Srirangam**, NAAC/RUSA/Autonomy Coordinator; **Dr. G. Sahaya Baskaran**, Placement Coordinator; **Dr. M. Srinivasa Reddy**, Best Practices.

We highly appreciate the assistance of the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

### **Sustainable Academe**

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

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DETAILED REPORT

# 1. Introduction

## 1.1 Statements of the Institution

### 1.1.1 Vision

The College proposes "To impart Higher Education with integral formation involving academic excellence, social commitment and value based leadership."

### 1.1.2 Mission

The College adheres and focuses "To form its students as "men and women for others" and mould them as global citizens with Competence, Conscience and Compassionate Commitment, with preferential option for the marginalized students."

### 1.1.2 Aim

The College has formulated the following aim to achieve its mission:

- To promote an integrated formation in and through academic, co-curricular and spiritual programmes
- To make the learners do their very best and to always strive for personal excellence in all aspects of life: intellectual, emotional, moral and physical, culminating in their holistic formation, and
- To conduct value-based programmes that enhances social commitment among faculty and students.

## 1.2 Assessment of the Institute

### 1.2.1 Affiliations

The Institute is affiliated to **Krishna University**, a state university located in Machilipatnam, Andhra Pradesh, India.

### 1.2.2 Certification

The College has received the following Certifications

- Certified as **an ISO 9001:2015 Institution** under the scope of certification "Providing Quality Education"
- Certified as **an ISO 14001:2015 Institution** under the scope of certification "Providing Quality Education"
- **NIRF** awarded the All India 24<sup>th</sup> Rank for Colleges in April 2017, **the highest rank for both the Telugu States**; 56<sup>th</sup> Rank (2018); 45<sup>th</sup> Rank (2019); 36<sup>th</sup> Rank (2020); 34<sup>th</sup> Rank (2021) and 94<sup>th</sup> Rank (2022)
- **AISHE** – The All India Survey of Higher Education code of the College is C-25376.

### 1.2.3 Accreditation

The following are details of the accreditation awarded by the National Assessment & Accreditation Council (NAAC) to the College.

Cycle	First	Second	Third
<b>CGPA</b>	-	3.65	3.66
<b>Grade</b>	A****	A	A+
<b>Year</b>	2002	2008	2017

*Table 1: NAAC Accreditation details of the Institute*

The College is due to enter its Fourth cycle of NAAC.

### 1.2.4 Recognitions

- Autonomous Status on 24.10.1987- Autonomy Implemented from the Academic Year 1988-1989 - Autonomy **First Extension** for five years from 1992-1993 – 1997-1998 **Second Extension** for five Years from 1997 -2002
- Autonomy **Third Extension** from 2001-2002 to 2005-2006
- Autonomy **Post Facto Approval for 2006-2007**; and **Fourth Extension** from 2007-2008 to 2012-13
- Autonomy **ex Post Facto Approval from 2013-2014 to 2016-2017 and Fifth Extension** from 2017-18 to 2021-2022
- Recognized as "**A-Grade College**" in the year 2015 and awarded the **First Rank**

in the College Rankings for 2017-2018 based on the **Key Performance Indicators** by the Commissioner of Collegiate Education, Govt. of A.P.

- ⇒ **Autonomy for P.G. Courses** by Krishna University on in May 2017

### 1.2.5 Approval

The technical course of Post Graduate Level, Management program and the Masters in Business Administration Course provided by the College are approved by **All India Council for Technical Education (AICTE), New Delhi.**

## 1.3 Achievements of the Institute

The Institute has a tremendous track record of excellence in Built form and educational services provided, below are some of the achievements of the prestigious Institute.

- ⇒ **'Certificate of Appreciation for maintaining Greenery in the premises'** by the Andhra Pradesh Greening and Beautification Corporation, 15 August 2022
- ⇒ **'Certificate of Recycling for handing over the waste'** to TES-AMM (India) Pvt. Ltd., 18 August 2022.
- ⇒ **'Certificate of Appreciation for securing 94<sup>th</sup> rank in NIRF Rankings, 2022'** awarded by the Andhra Pradesh State Council of Higher Education,
- ⇒ UGC awarded the status of a **"College with Potential of Excellence"** in September 2004 with a grant of Rs. 100 Lakhs
- ⇒ Selected under the UGC **Community College Scheme** in August 2015
- ⇒ Selected under the **Star College Scheme** in February 2016 by the Dept. of Biotechnology, Govt. of India, **becoming the first and only College in both the Telugu states** so far to have been selected under this Scheme.
- ⇒ Selected under Component 08 for *'Enhancing Quality and Excellence in select Autonomous Colleges'* by the **R.U.S.A.** of MHRD, Govt. of India, in June 2018.
- ⇒ Identified **for Support under the FIST Project of DST**, in January 2018, by the Ministry of Science and Technology, Govt. of India.



## 1.4 Facilities

The College emphasizes on latest technological advancement through its educational initiatives. Our interaction with the staff members and team showed that they are keen for further upgrading and use of sustainable features. Some of the current key facilities are listed below.

- Hostel facilities for boys and girl students; Health Check-up Centre
- Social welfare activities
- Library (Computerized), Teacher's Common room and Rest room for Non-Teaching Staff, Play Ground, Outdoor and Indoor games facilities, Multi-gym facility.
- NCC-Units and NSS Units
- Women's cell including committee against sexual harassment.
- Social interactions with neighbourhood society by extension activities.
- Education Tours and Surveys.

DETAILED REPORT

## 2. Institution overview

### 2.1 Populace analysis for Academic year 2021-2022

#### 2.1.1 Students data

The student data (shared by the College) shows there were a total of **4,218 Boys and 2,212 Girl students**, thus there were **a total of 6,430 students** on the premises.

#### 2.1.2 Staff data

Type	Male	Female	Total
Teaching staff	127	77	<b>204</b>
Non-Teaching staff	78	20	<b>98</b>
<b>Total Staff Members</b>	<b>205</b>	<b>97</b>	<b>302</b>

*Table 2: Staff data of the Institution for 2021-2022*

The staff data shows the premises had a total of **302** Staff Members.

### 2.2 Populace analysis for Academic year 2020-2021

#### 2.2.1 Students data

The student data (shared by the College) shows there were a total of **4,013 Boys and 2,182 Girl students**, thus there were **a total of 6,195 students** on the premises.

#### 2.2.2 Staff data

Type	Male	Female	Total
Teaching staff	144	78	<b>222</b>
Non-Teaching staff	76	22	<b>98</b>
<b>Total Staff Members</b>	<b>220</b>	<b>100</b>	<b>320</b>

*Table 3: Staff data of the Institution for 2020-2021*

The staff data shows the premises had a total of **320** Staff Members.

## **2.3 Total College Area & College Building Spread Area**

The **total site area is 98 acres** and the **total Built-up area of the Institute is 1,20,000 sq. ft.** for an approximately 6,732 footfalls.

## **2.4 Institute Infrastructure**

### **2.4.1 Establishment**

The Institute was established in 1953.

### **2.4.2 Spatial Organisation**

The College buildings are designed in one of the unique Architectural style's the stone material blocks are appropriately oriented. These provide an ambience of heritage and educational arena for the young minds.

The blocks are surrounded by huge walkways and driveways with appropriate zoning of the site maps; these walkways are landscaped with huge and an extensive number of plantations. The overall softscape and hardscape has a positive impact.

## **2.5 Operation and Maintenance of the premises**

The data collection session was held with the staff regarding the operation and working hours. The schedule mentions that the College is working Monday to Saturday with the timings being 8:00 hours to 13:30 hours.

## 3. Green Building Study as a Research based technical audit

### 3.1 About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution sustainable and healthy premises for its inhabitants.

### 3.2 Analysis of the Green Building Study Audit

The procedure included detailed verification for the following:

#### Energy Audit

- Analysis of the Lights, Fans, AC, Equipment
- Renewable energy
- Scope for reducing the current energy bills if any
- Improvement in the thermal comfort of the premises

#### Green Audit

- Green initiatives
- Hygiene audit
- Water Audit - Analysis of the current water consumption of campus; Rainwater harvesting and Wastewater treatment on the premises.
- Waste Audit - Current waste produced, its segregation, and usage; Strategies to be adopted for waste management and awareness

#### Environmental Audit

- Analysis of the current landscape + hardscape of the premises
- Analysis of the flora and fauna of the premises
- Strategies adopted at present to enhance vegetation
- Measures that can be adopted for ecological improvement of the premises.

### 3.3 Strategy adopted for Green Building Study Audit

The strategies included data collection from the admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collection, and preparation of the Report.

### 3.4 Activities undertaken for the Green Building Study Audit

- 25 November 2022 - Discussion with the College
- 7 December 2022 - Allotment and Initiation by the College
- 14 December 2022 - Site visit at the Institute
- 18 December 2022 - Survey of students and staff completed
- 30 December 2022 - Submission of the Report

## 4. Site Study

### 4.1 On-site features as per our study

The following listed are some of the positive site elements which are beneficial to the college in terms of tangible and intangible benefits.

- **Location** - The Loyola College Society's Andhra Loyola College (Autonomous) located at Door No. 54-16-14, Govt. Polytechnic Post, Vijayawada - 520 008, Andhra Pradesh, India and falls under the Vijayawada Urban Mandal Taluka; Gunadala village; Ntr Vijayawada district and the Vijayawada Municipal Corporation.
- **Neighbourhood context** - The premises is surrounding by open spaces and Residential, Commercial and Educational areas on the immediate surroundings of the site.
- **Natural physical features** – The premises includes a rich biodiversity and huge number of plants in the adjacent open space. The site does not have major different in the land levels (contours).
- **Manmade features** – The premises is situated in a semi-urban area amidst residential areas and open spaces with appropriate proximity to necessary amenities. There is sufficient appreciation space for entrance. The materials used for construction are RCC and the landscaping includes innumerable natural trees as well as potted plants.
- **Circulation** – There is a smooth transition of pedestrian traffic inside the premises due to the large entrance gate and the huge open space where vehicles of students and staff is parked.
- **Climate** –The climate here is tropical. When compared with winter, the summers have much more rainfall. According to Köppen and Geiger, this climate is classified as Aw. The average annual temperature in Vijayawada is 28.2 °C | 82.8 °F. The annual rainfall is 974 mm | 38.3 inch. The Vijayawada is situated close to the equator and therefore the summers are not easy to define.

(Source: <https://en.climate-data.org/asia/india/andhra-pradesh/vijayawada-715084/>)

## **4.2 Positive site features as per our study**

### **a) User friendly movability in premises**

There are provisions of Kerb Ramp in the Building premises, also low height hand rail for ease of access.

### **b) OPAC system**

The system in the library is beneficial for the students.

### **c) Resting places**

There are provisions for resting places on-premises outdoor and indoors.

### **d) Ample greenery**

There are provisions for the garden and plenty of traditional trees on the premises.

### **e) Cool rooftops**

The College has the Terrace roofs painted with white cover it helps reduce the temperature of the spaces.

### **f) Avoid using plastic in premises**

There are provisions for ban on the use of plastic bags or products in the Premises for office purpose as well eco-friendly materials area used.

### **g) Cleanliness and regular maintenance**

There are ample provisions to maintain the site, cleanliness of the premises, regular maintenance and infrastructure up gradation.

### **h) Provision of wheelchair**

There is provision of wheelchair in the premises for specially abled, senior citizens it is very beneficial facility.

### **i) Eliminating the transmission signal inside the premise**

The College has eliminated transmission signal in the interiors to protect ecosystem.

# Ecological (Environment) Audit



*Background reference image Yugal Shrivastava on pexels*

## 5. Ecological (Environmental) Audit

Environment is an essential part for human survival. We co-exist with the environment and it cannot be termed as a separate entity. The Ecological audit helps to understand the flora, fauna that exists and steps that can be taken to improve the same. To denote if there are problems related to sound in and around the surrounding. In terms of the carbon footprint it helps in keeping a tab on the eco-friendly habits incorporated by the inhabitants of the premises. Health today is the topmost priority, a general understanding of the initiatives undertaken along with sufficient hygiene practices adopted. Universal design is applicable to all built and unbuilt spaces.

### 5.1 Open Spaces

The College is located adjacent to many open farmlands that practice traditional agriculture and lead a pollution free healthy lifestyle. The College premises as well has open spaces for students which act as recreational spaces, these are available in multiple sizes. However, their up gradation for ecological enhancement is something they should work upon.

### 5.2 Flora and fauna audit

#### 5.2.1 Flora audit

A flora survey drive was carried out to identify the total numbers of plants and trees by the Team of College, this was documented in detail by Dr. B. Siva Kumari, Department of Botany into a book titled '1001 Flora of ALC Campus' the third edition was released in April 2022. **At present there are 1,001 types and innumerable numbers of plantations comprising of plants, trees, shrubs.**

##### 5.2.1.1 Some Important Plants in the premises

- ➔ *Dalbergio sisso*
- ➔ *Dalbergia latifolia* Rose wood
- ➔ *Azadirachta indica*
- ➔ *Santalum album*



- *Terminalia arjuna*
- *Adina cordifolia*
- *Bambusa arundinacea*
- *Pterocarpus marsupium*
- *Melia azedarach Turaka*
- *Anthocephalum cadamba*
- *Butea monosperma*

#### 5.2.1.2 Important Fruit Yielding Plants

- *Ananas comosus*
- *Aegle marmelous*
- *Annona muricata*
- *Annona reticulata*
- *Artocarpus communis*
- *Artocarpus heterophyllus*
- *Terminalia catappa*
- *Mangifera indica*
- *Cocas nucifera*
- *Achras sapota*
- *Areca catechu*
- *Phoenix sylvestris*
- *Elaeis guinensis*
- *Feronia limonia*
- *Anacardium occidentale*
- *Pithacalobium dulci*

### 5.2.1.3 Ornamental Plants

- *Acacia auriculiformis*
- *Antigonon leptopus*
- *Artabotrys odoratissimus*
- *Bauhinia purpurea*
- *Callistemon citrinus*
- *Cassia fistula*
- *Quisqualis indica*
- *Ixora sps*
- *Mimusops elengi*
- *Mussaenda frondosa*
- *Nyctanthes arbor-tritis*
- *Millintonia hortensis*
- *Putranjiva roxburghii*
- *Tabebuia pentaphylla*

### 5.2.1.4 Important Medicinal Plants

- *Acorus calamus*
- *Aloe vera*
- *Alpinia calcarta*
- *Andrographis paniculata*
- *Centella asiatica*
- *Coleus blumi*
- *Curcuma amada*
- *Cissus quadrangularis*
- *Gymnema sylvestre*
- *Hemidesmus indicus*

- *Lawsonia inermis*
- *Piper betle*
- *Stevia rebandiana*
- *Sauropus androgynous*

#### 5.2.1.5 UNIQUE PLANTS

- *Calophyllum inophyllum*
- *Caralluma umbellata*
- *Carissa carandas*
- *Cinnamomum verum*
- *Couroupita guianensis*
- *Curcuma domestica*
- *Elettaria cardamomum*
- *Gloriosa superba*
- *Madhuca longifolia*
- *Murraya exotica*
- *Piper nigrum*
- *Pterocarpus santalinus*
- *Rauvolfi a serpentina*
- *Saraka indica*
- *Smilax zeylanica*
- *Saurops androgynus*
- *Tinospora cordifolia*
- *Vanilla planifolia*
- *Vanda roxburghi*
- *Alstonia scholaris*

## 5.2.2 Fauna audit

The details of the fauna available in the premises are documented as - *Earthworms, Leech, Houseflies, Mosquito, Bee, Wasp, Beetle, Spider, Grasshopper, Ant, Caterpillar, Butterfly, Snake, Lizard, Chameleon, Sparrow, Parrot, Maina, Owl, Sunbird, Weavers, Bulbul, Cuckoo, Cat, Squirrel, and Mouse.*

**The premise has a beautiful and rich fauna; it enhances the co-existence and provides a fresh environment for the premises.**

## 5.3 Noise Audit

The College is located adjacent to the road which is connecting to a major road of the town. However, there are no serious issues faced due to outdoor noise or even indoor noise as they College is located in an entire semi-urban set-up surrounded with farmlands.

## 5.4 Carbon Footprint Audit

### 5.4.1 Eco-friendly Commuting Practices

Based on data collection and discussion with staff the following points were noted:

- **No vehicle day is practiced on Thursday's**
- Majority of the students and staff members commute using cycles or car pooling
- Many of the them also walk up to the premises.
- There are hostel facilities and staff quarters inside the premises which are used by 25-30% of the populace.

### 5.4.2 Heat Island Reduction

*The site has a cluster planning of blocks attached as appendages. These are related by their proximity with each other and yet express their individual identities in volumes of one or two-storeyed buildings.(Form, Space and Order)*

The design of the spaces is an amalgamation of built and open spaces surrounded by huge numbers of plantations and wide canopied trees which provide ample shade. There was no heat island effect observed. However, there was certain degree of weathering of roof cover observed. This is because the buildings are too old.

### 5.4.3 Outdoor Light Pollution Study

The college compound lights are not upward looking thus, these do not cause light pollution.

## 5.5 Universally accessible premises (Inclusive design)

*As per World Report on Disability, 2011 there are 180 million approx. Persons with Disabilities that makes it 15% of total population of India.*

The following facilities are available on the premises for the specially-abled as part of universally accessible premises initiatives. As per our study these are sufficient and good.

- ➔ **Ramps available in every block**
- ➔ **Wheelchair**
- ➔ **Handrails along staircase**
- ➔ **Low height risers in the staircases**

## 5.6 Fire Safety

Fire and life safety are an important consideration of the National Building Code 2016. This aspect is touched upon as part of this study in the capacity of an Architect registered with the Council of Architecture. As part of the research, fire safety audit was considered from the 'Building systems' perspective. The following provisions are available at present.

- ➔ Fire extinguisher on every floor.
- ➔ Open staircase without any barriers and free of storage or combustible material.

## 5.7 Recommendations for a Sustainable Habitat by Greenvio Solutions

### Site beautification

- **Additional facilities for birds** - There can be provision for drinking water and food facility for birds visiting the College premise.
- **Nutrition pits** - Certain pits can be demarcated as 'Nutrition pits' where the organic food from the kitchen and Canteen fruit peels and fruits or vegetables can be degraded for making nutrition-rich soil.
- **Garden development** - The existing open space should be designed as an Architectural landscape.
  - **Nursery documentation, expansion and beautification** – The premises has should have a nursery, details can be decided as per the landscape beautification.
  - **Scientific name plates and QR codes** – The NSS team should undertake a project to have name plates with QR codes on every plant of the premises.
  - The roofs of the buildings should be turned into **Green roofs** (By introducing terrace or vertical gardens) or **Cool roofs** (By painting the same with Cooltop material for solar reflectivity).

### Universally accessible premises

- **Universal Toilet** - There should be a minimum of 1 toilet for the specially-abled people as per guidelines prescribed by the National Building Code 2016 with size being a minimum of more than 1.5m x 1.5m
- **Design up gradation for Inclusive premises** – The following activities can be undertaken:
  - Wheelchair, Lifts in every block so that every block has its own wheelchair.
  - Include Disability Services staff/students with disabilities on planning boards and offer multiple ways to participate in programs
  - Information/materials provided in multiple forms (Standard, electronic, large print, Braille)
  - Class outlines/notes are available for all students on accessible websites.

## Pollution Control

- ➔ **Bicycles as a gift** - As an appreciation gesture maybe the student's toppers/ staff best performers can be awarded a bicycle occasionally.
- ➔ **Avoid paper wastage through books** - The College can collect all old semester notebooks; these can either be converted to reusable paper on the premises through a workshop or using a shredder machine or handed over to a vendor for making fresh paper. Additionally, the Students can be motivated to undertake similar practices on an individual note.

## Life safety

- ➔ One fire extinguisher in every space which has an air conditioner.
- ➔ Every laboratory space should have both sand bucket and fire extinguisher.
- ➔ Every space which has a gas cylinder or combustible equipment should have a provision for additional safety including the barricade around the gas cylinders, appropriate safety boards.
- ➔ Fire safety practices such as signages, Fire hydrant cabinets, sand buckets.

## Smart and responsible environment systems

- ➔ **Smart Gardening System** - The University can undertake a Smart Gardening system using IoT Technology such as an automated watering system. This will result in saving time by scheduling time for watering; Saving money and water as smart irrigation systems have automated water schedules in addition to tracking dampness of soil which helps the irrigation system know when and how much the garden needs. It also helps in healthier plants as with the help of apps, smart irrigation systems, or even smart growing containers, these tasks can be provided evenly and allow the plants to be healthier and more productive. More information on this system can be checked here <https://www.happysprout.com/inspiration/what-is-smart-gardening/>
- ➔ **Community gardening** - There can be provisions for community gardening in addition to allowing the general public to use the parks on the premises for walks and jogging.

## 6. Inferences as Consolidated study

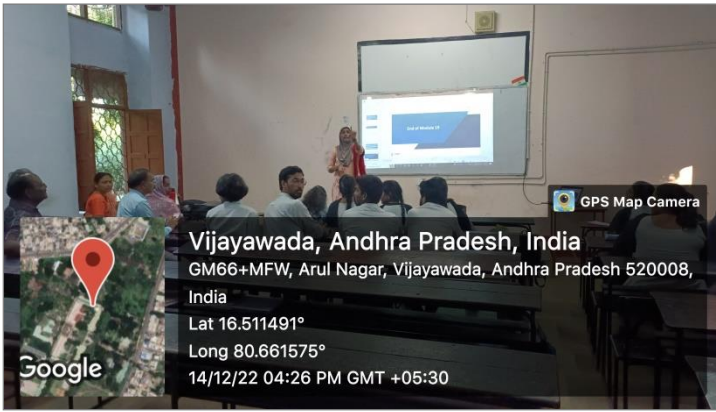
*(Based on the site visit)*

These are to be considered as ***second priority*** for implementation, once the section wise recommendations are implemented. The following recommendations should be ***implemented within the next 2.5 – 3.5 years from the date of the Report submission.*** The Institute can execute a plan of action after discussion with Project Head.

- **Dedicated pathways with tactile flooring** – The College can adopt a separate and inclusive design model for providing dedicated tactile flooring walkways.
- **Demarcation of the walkways and pathways** – This activity can be undertaken through appropriate paint or paving material.
- **Signing of a MoU for improvement w.r.t. to Green Building aspects of premises**
- **Articles and Documentation** – The premises has multiple features which add to the beauty of the nature and improve the environment in the premises, it is thus suggested to have an article written every month as guided by the Team based on the MoU.
- **Carbon sequestration study** – This study will have to under taken in two phases; one for the dense forest in the premises and the second phase will be for all the plants in the premises. **It can be undertaken through a MoU with the team who has conducted the audit.**
- **Determination of Plastic (orange) zones** – The study and execution can be undertaken through a pilot project where the waste plastic can be collected through areas within 5 km of the premises and a product can be developed. **It can be undertaken through a MoU with the team who has conducted the audit.**



# On-site investigation and physical verification Audit Team during the visit on 14 December 2022



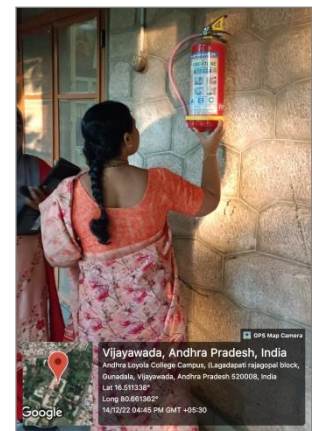
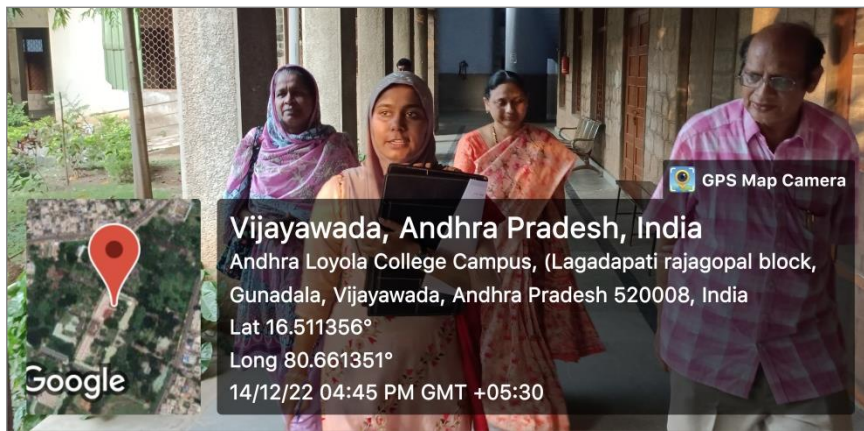
Discussion with the MBA Program Students on 'Green Buildings' and Induction meeting with the Core Team



On-site review with the team for water management, life safety aspects, environmental awareness campaign, universal accessibility and other features



Group photo with the Team



Site discussions with the Team



On-site review with the team for waste management, life safety aspects and organic farm



Site premises

## 7. References

The study is based on the data collected, analysed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyse and study the data collected.

### 7.1 Local references

Climate data <https://en.climate-data.org/asia/india/andhra-pradesh/vijayawada-715084/>

### 7.2 International references

- Form, Space and Order by Francis D. K. Ching
- Used only for understanding Universal design - Universal Accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National center for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation and [www.umassd.edu](http://www.umassd.edu)
- The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- Streetscape elements – Chapter 6 on San Francisco
- American lung association <https://www.lung.org/>
- Study related to air pollution <https://www.airgle.com/>
- Exploring the light pollution <https://education.nationalgeographic.org/>
- Accessibility study <https://www.washington.edu/>
- Urban heat island effect <https://www.epa.gov/heatislands/what-you-can-do-reduce-heat-islands>



# Environment Audit Certificate

*The study is conducted as per Indian and International Green Building Standards initiated in the capacity of an Accredited & Certified Green Building Professional*

It is awarded for **2020-2021 and 2021-2022** to the Esteemed Institution  
(Analysed for 2 years and extended validity for 1 year, thus total 3 years)

The Loyola College Society's

## **Andhra Loyola College (Autonomous)**

Door No. 54-16-14, Govt. Polytechnic Post, Vijayawada - 520 008, Andhra Pradesh, India

*(Site visit held on 14 December 2022)*

As part of the Institution's initiatives for a Healthy & Sustainable College the audit was conducted.  
We appreciate the immense efforts taken by Staff and students towards the Environment Protection and Conservation.

Issued on **Friday, 30 December 2022** valid till **December 2023**

  
**Ar. Nahida Shaikh**

Architect, IGBC Accredited Professional, ISO Certified I. A. (IMS)  
Assocham GEM Certified Professional (Regn. No. 22/718)

Project Head and Green Building Professional-Consultant

## **Sustainable Academe**

Sustainability Department of Greenvio Solutions, Naigao

An environment Design and Consultancy developing Healthy and Sustainable Env

[sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com) | [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)



# ENVIRONMENT AUDIT

STUDY PERIOD (TWO YEARS) 2022 – 2023 & 2023 - 2024

Sustainability study  
**AUDIT REPORT**

**Studied for**  
The Loyola College Society's  
**Andhra Loyola College**  
**(Autonomous)**

Door No. 54-16-14, Govt. Polytechnic Post, Vijayawada -  
520 008, Andhra Pradesh, India

**Studied in the capacity of**  
Accredited and Certified GBP



Website: <https://thegreenviosolutions.co.in/>

Email: [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)

# Disclaimer

The Audit Team has prepared this report for **The Loyola College Society's Andhra Loyola College (Autonomous)** located at Door No. 54-16-14, Govt. Polytechnic Post, Vijayawada - 520 008, Andhra Pradesh, India based on input data submitted by the Institute analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the internal team. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied or regenerated in any form.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

**Ar. Nahida Abdulla**

**Greenvio Solutions**

*Developing Healthy and Sustainable Environments*

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting audits

Palghar District, Maharashtra- 401208

[sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com)



## Acknowledgement

The Audit Assessment Team extends its appreciation to **The Loyola College Society's Andhra Loyola College (Autonomous), Andhra Pradesh** for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our heartfelt thanks to Chairperson of the entire process **Dr. G.A.P. Kishore, S.J.**, Principal for the valuable inputs.

We are also thankful to Institute's Task force who have played a major role in data collection.

- Teaching staff member – **Dr. M. Srinivas Reddy, Vice Principal; Dr. A. Lavanya, Criteria 7 Incharge** and **Dr. G. Jameema, HOD Agriculture and Rural Development**
- Admin staff member – **Ms. Karuna**

We appreciate the cooperation of **entire Teaching, Non-teaching, and Admin staff** for their support while collecting the data.

### Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208



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# 1. Introduction

## 1.1 Statements of the Institution

### 1.1.1 Vision

The College proposes "To impart Higher Education with integral formation involving academic excellence, social commitment and value based leadership."

### 1.1.2 Mission

The College adheres and focuses "To form its students as "men and women for others" and mould them as global citizens with Competence, Conscience and Compassionate Commitment, with preferential option for the marginalized students."

## 1.2 Assessment of the Institute

### 1.2.1 Affiliations

The Institute is affiliated to **Krishna University**, Machilipatnam, Andhra Pradesh, India.

### 1.2.2 Certification

- Certified as **an ISO 9001:2015 Institution** under the scope of certification "Providing Quality Education"
- Certified as **an ISO 14001:2015 Institution** under the scope of certification "Providing Quality Education"
- **AISHE** – The All India Survey of Higher Education code of the College is C-25376.

### 1.2.3 Accreditation

The College is due to enter its Fourth cycle of NAAC.

### 1.2.4 Recognitions

**Autonomy for P.G. Courses** by Krishna University on in May 2017

### 1.2.5 Approval (AICTE)

Technical course are approved by **All India Council for Technical Education, New Delhi.**

## 2. Overview

### 2.1 Summarised Populace analysis

The information shared by the Institute shows there are more than 4,300 students and 220 staff members in the premises

### 2.2 Site & Institute building spread details



*Plate 1: Site map of the campus*

More than 80% of the site has green cover.

### 3. Evidence

1 | Page

**Evidence documents for Site visit of external audit team**


Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit


Institute: Andhra Loyola College Date: 13/2/24


**Document objective: Inferences of the Site visit**

Observations (Positive aspects)	Suggestions (Improvement aspects)
<b>Green Audit</b>	
- Waste water treatment plant; R.O. plant; rain water harvesting; medical facility; excellent waste management measures undertaken	No major suggestions but documentation of reflectance can be increased
<b>Energy Audit</b>	
- Energy efficient lights, fans are available - Fire & life safety measures are well undertaken	- Sensor based facilities, systems can be undertaken - Fabrication of electrical systems can be improved
<b>Environment Audit</b>	
- Green cover is good & well improved	Continue with the current practices; no changes




Signature & round seal  
Name: Dr. Rev. Fr. G. A. P.  
Designation: Principal  
For the said Institute






Signature & round seal  
Name: Mrs. P. S. Shalini  
Designation: Project Coordinator  
For The Greenvio Solutions



Website: thegreenviosolutions.co.in Email: greenviosolutions@gmail.com



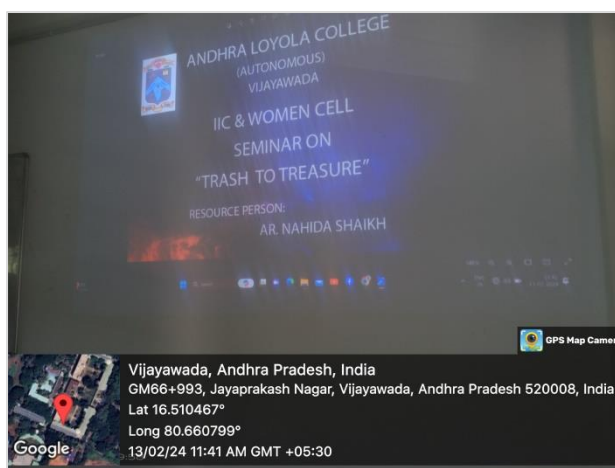
**Plate 2: Evidence files related to observations**



*Plate 3: Discussion with the team*



*Plate 4: On-site inspection with the team*



*Plate 5: Seminar on 'Trash to Treasure' for stakeholders*


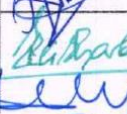

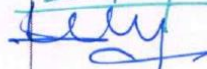

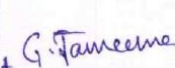
### Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla  
Accredited & Certified Green Building Professional, ISO IA (IMS)  
Audit objective: Green Building up gradation of the premises

Audits covered:  Green audit  Energy audit  Environment audit

Institute: Andhra Loyola college Date: 13/2/24

Document objective: Induction Meeting attendance sheet

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Rev. Fr. Dr. G. A. P. Kishore, S.J.		Principal	
4.	Dr. M. Srinivas Reddy		vice principal	
5.	Dr. A. Lavanya		criteria & incharge	
6.	Dr. G. Jameema		HOD Agriculture and Rural development	

  
Signature & round seal  
Name: G.A.P kishore, S.J.  
Designation: Principal  
For the said Institute



  
Signature & round seal  
Name: Mrs. F. A. Shaikh  
Designation: Project Coordinator  
For The Greenvio Solutions



Website: [thegreenviosolutions.co.in](http://thegreenviosolutions.co.in) Email: [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)



Plate 6: Evidence file related to induction meeting attendance record

**Evidence documents for Site visit of external audit team**


Audit team headed by-external expert - Ar. Nahida Abdulla  
 Accredited & Certified Green Building Professional, ISO IA (IMS)  
 Audit objective: Green Building up gradation of the premises


Audits covered:  Green audit       Energy audit       Environment audit

Institute: Andhra Loyola College      Date: 13/2/24

**Document objective: Exit Meeting attendance sheet**

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Rev. Fr. Dr. G-A-P Kishore, SJ		principal	
4.	Dr. M. Srinivas Reddy		Viceprincipal	
5.	Dr. A. Lavanya		Criteria 7 incharge	
6.	Dr. G. Jameema		HOD Agriculture and Rural development	

  
 Signature & round seal  
 Name: Dr. Rev. Fr. Kishore  
 Designation: principal  
**For the said Institute**



  
 Signature & round seal  
 Name: Mrs. F. A. Shaikh  
 Designation: Project Coordinator  
**For The Greenvio Solutions**



Website: thegreenviosolutions.co.in Email: greenviosolutions@gmail.com



**Plate 7: Evidence file related to exit meeting attendance record**

## 4. Observation

### 4.1 Positive/ Good practices

The details of the Positive/ Good practices are documented below:

#### ⇒ Zone wise bifurcation of site

- No Parking Zone
- No Plastic Zone
- No Vehicle Zone
- Silent Zone
- No Mobile Zone
- Dedicate Vehicle Zone

#### ⇒ Display notice

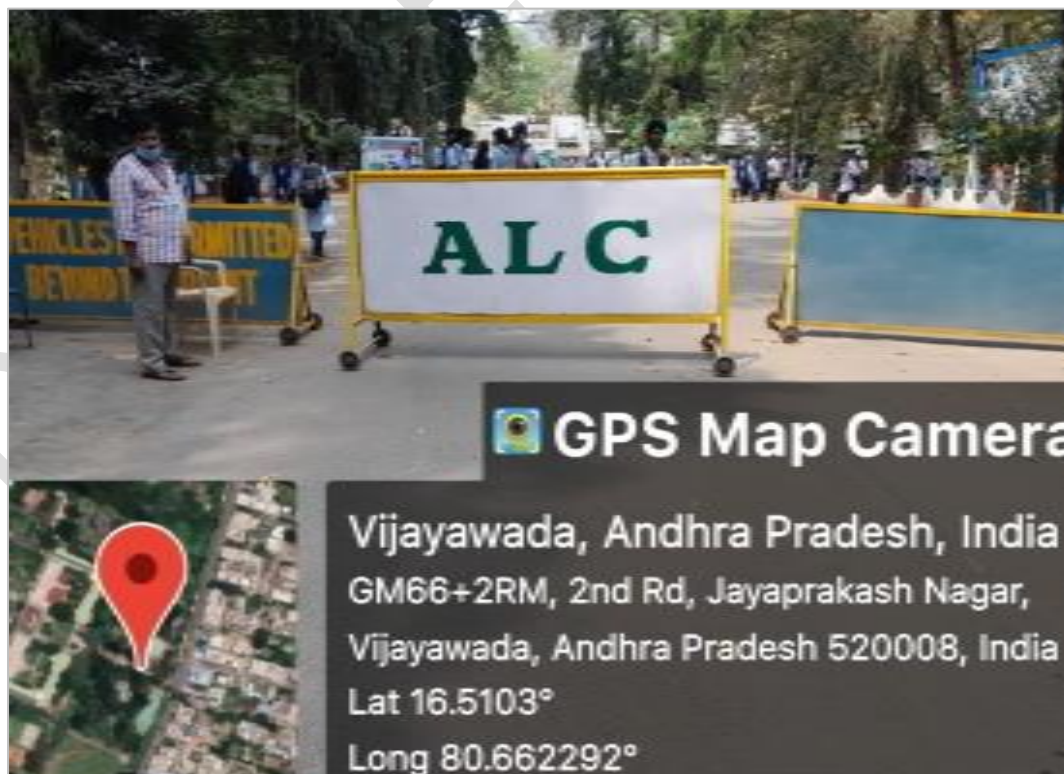
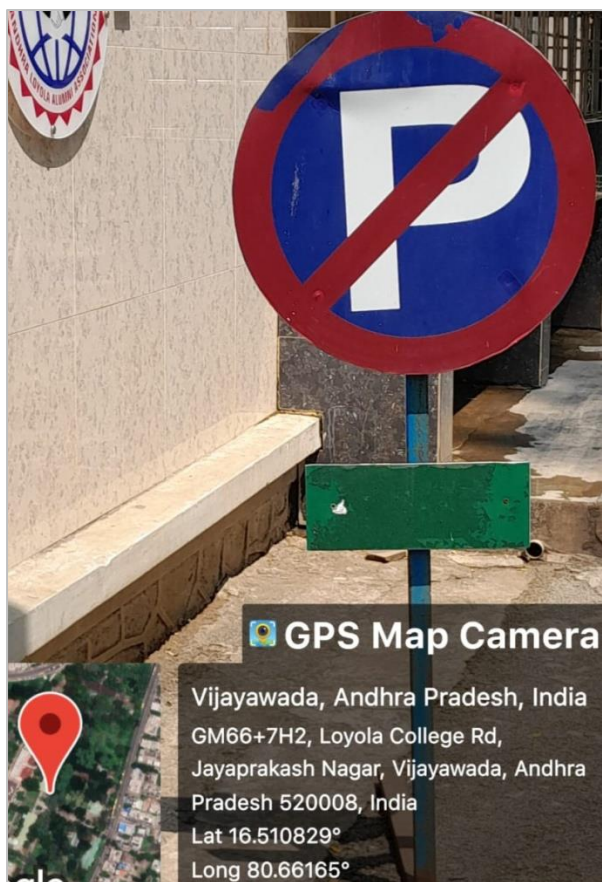
#### ⇒ Plantation drive and gift to external stakeholders

#### ⇒ Green cover and its varieties

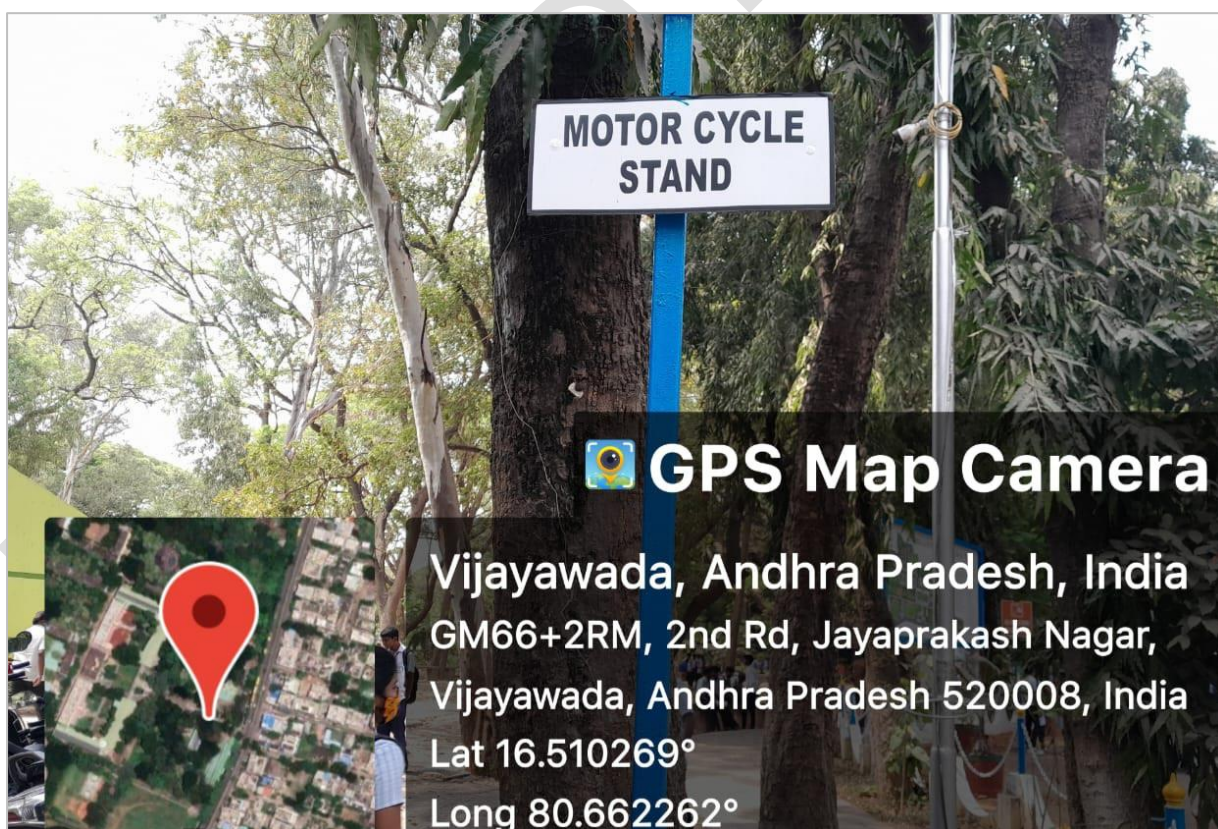
- Green house
- Organic farm – Sold to the campus stakeholders by the agricultural department
- Landscape plantations
- Open Ground



### 4.1.1 Zone wise bifurcation of site

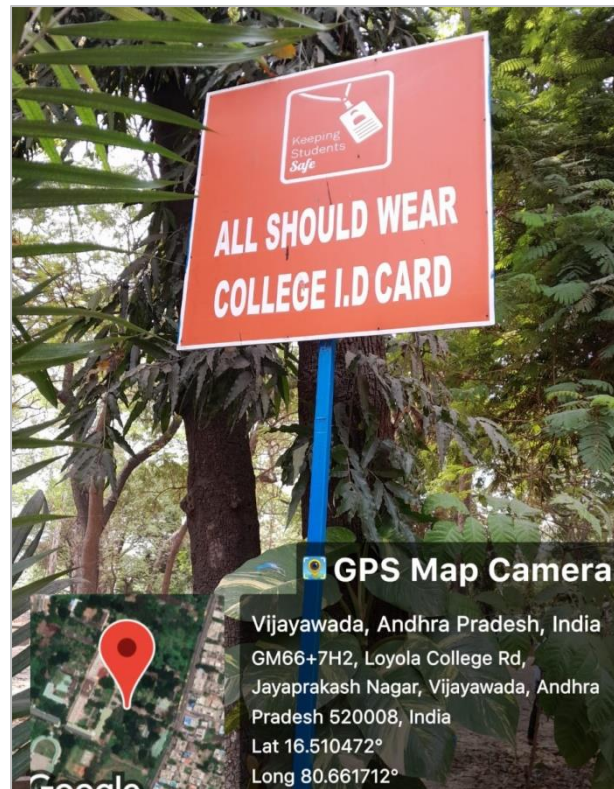


*Plate 8: No Parking Zone, No Plastic Zone and No Vehicle Zone*



*Plate 9: Silent Zone, No Mobile Zone and Dedicate Vehicle Zone*

### 4.1.2 Display notice



*Plate 10: Display notice*

### 4.1.3 Plantation drive and gift to external stakeholders



Vijayawada, Andhra Pradesh, India  
 # Christrurajpuram, GM66+X2J, near RCM Church, Jayaprakash Nagar,  
 Vijayawada, Andhra Pradesh 520008, India  
 Lat 16.512151°  
 Long 80.659906°  
 12/08/23 02:28 PM GMT +05:30



*Plate 11: Plantation drive and gift to external stakeholders*

### 4.1.4 Green cover and its varieties



**Plate 12: Green House, Organic farm, Landscape plantations and Open Ground**

## **4.2 Areas of improvement**

*Note: The text mentioned in this type of font (red colour, bold and italics style) determines a suggestion*

### **4.2.1 Backyard up gradation should be done**

*The backyard of the garden should be developed with proper landscape and walkways etc.*

### **4.2.2 Compound wall beautification should be undertaken**

*The compound walls should be appropriately designed with uniformity in the font size, colour palette etc. moreover they can directly painted with awareness messages serving as an initial activity for the fresher's every year*

DETAILED REVIEW

## 5. Compliance

The compliance study was carried out through investigative ways. This was done to understand the **extent of suggestions and their implementations based on previous report of Academic years 2020-2021 and 2021-2022. The current study is for academic years 2022-2023 and 2023-2024.**

### 5.1 Compliance status

The details of compliance are analysed on previous year Report.

S. No.	Recommendation Title	Compliance Status
1.	Introduce bird feeders	Completed
2.	Nutrition pits	Under process, however there is scope for improvement thus this has been suggested as a recommendation again
3.	Garden development (Improving ecological footprint)	Under process, since the scale of the campus is huge the project is undertaken in phases; however there is scope for improvement thus this has been suggested as a recommendation this year as well
4.	Nursery development	Under process – However not recommended as this project should be completed first in the next one year
5.	Documentation of the plantation	<p>Under process – Since the scale of campus is huge the project will have to be undertaken in stages such as:</p> <ul style="list-style-type: none"> <li>➤ Numbering plantations</li> <li>➤ Naming plantations</li> <li>➤ Coding plantations</li> </ul> <p>Since all the three are undertaken simultaneously the study would suggest to complete the numbering for the next year as the first step of study</p>

6.	Premises upgrading w.r.t biodiversity improvement7.	<p>This has been under process, however as compared to last year there has been a drastic improvement for this section</p> <p>It should be noted that the points mentioned in point 3 and the current point are similar and not the same.</p> <p>This point refers to the various projects undertaken such as organic farm, greenhouse etc. this not just serve the biodiversity but also a practical learning to stakeholders</p>
7.	Website up gradation w.r.t. green initiatives in a dedicated section	Not undertaken
8.	Environmental course	There is a dedicated Agriculture department and course; however certain climate change related courses can be explored for all stakeholders and general public

*Table 1: Details of the compliance study*

DETAILED

## 6. Roadmap

The roadmap refers to the recommendations/ inferences/ suggestions that have been derived after the 'Green Building study' of the premises.

### 6.1 About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution sustainable and healthy premises for its inhabitants.

### 6.2 Roadmap

The Institute suggested to prepare a roadmap for data collected, observed, investigated for a specific duration. This was due to the systematic steps undertaken to conduct the exercise.

The roadmap would act as a 'PLAN OF ACTION' to implement all the suggestions in a detailed manner. The same has been identified in two phases for a total duration of three years.

#### ➔ Phase 1

- *Duration: One year from the date of Report submission – Shared currently*
- These are first hand suggestions
- They are easy and quick to implement
- They involve close very less or almost no expenses
- They can serve as a foundation for the entire plan of action

#### ➔ Phase 2

- *Duration: Within two years of Phase one completion – Not shared currently*
- There are certain expenses but no major cost involved in implementation

The study does not complete in just two phases, but it sets a benchmark to achieve the goal of achieving the next stages of green building:

- ➔ Nearly Net zero campus (Energy/ Water)
- ➔ Net Zero campus (Waste/ Energy/ Water)
- ➔ Net positive campus (Waste/ Energy/ Water)



## Phase 1 – First priority

To be implemented within 'ONE' year from date of Report submission.

### Section 1 – Eco-restoration of outdoors (Landscape perspective)

#### ➔ Improve the ecological footprint of the premises

- Undertake the landscape ecological redesign to improve green cover

#### ➔ Numbering the plantations in the premises

- Make a list of all the plantations in the premises
- Secondly, start numbering the plantations in either of the ways:
  - Painting the nos. on iron plates and nailing the same
  - Printing the nos. on paper, laminating and pasting the same
  - Painting the nos. with letters and nos. directly
- Care should be taken that the display should be visible
- Uniform color palette should be identified and used
- Measures should be taken to avoid withering during monsoon
- This could be undertaken as a student activity



*Reference suggestions 1: Numbering the plantations*

### ➔ Nutrition pits

- Certain pits (mound of earth covered in green grass/ shrubs) can be demarcated as 'Nutrition pits' where the organic food from the kitchen and Canteen fruit peels and fruits or vegetables can be degraded for making nutrition-rich soil.

## Section 2 – Documentation

### ➔ Messages on the beam area

- Include quotes and messages from eminent personalities all over the premises on beam for inspiration and beautification.

### ➔ Awareness

- Introduce zone wise display boards at relevant locations

## Section 3 – Amenities

### ➔ Facilities

- Increase the nos. of speed limit signage
- Increase the nos. of speed breakers
- Increase the nos. of zebra crossing
- Increase the nos. of first aid boxes in every block
- Increase the nos. of suggestion box every floor of the premises

## Section 4 – Environmental management systems

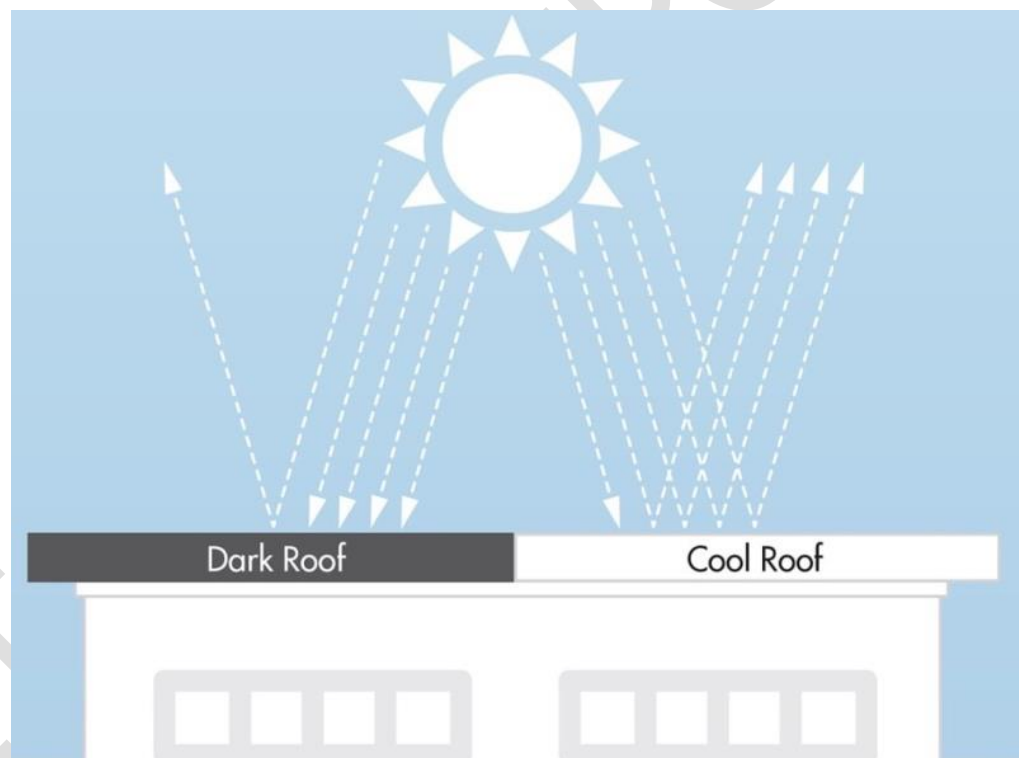
### ➔ Pollution control measures

- Vehicle usage - Restricting the speed limit of vehicles on the premises to 10 km per hour, not honking on the premises will help in maintaining the sound in control and emphasis on a silent zone.

- Avoid burning waste - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff

### ➔ Heat island control measures

- Cool rooftops
  - Keep terrace areas free of any kind of storage materials
  - Terrace rooftops can be painted with Cooltop (Reflective material) to reflect the harsh sunrays and reduce the heat absorption in the top most floor and surrounding areas of the building.
  - Introduce signboards about 'No students are allowed to enter'
  - Undertake feasibility study of before - after temperature reading.



**Plate 13: Cool roof comparative analysis (For reference purpose only)**

Source: Image by <https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387>

## 7. Compilation

The study is based on the data collected, analyzed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyze and study the data collected.

### National references

- IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- IGBC Green Landscape Rating system, March 2013

### International references

- The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- Streetscape elements – Chapter 6 on San Francisco
- American lung association <https://www.lung.org/>
- Study related to air pollution <https://www.airgle.com/>
- Exploring the light pollution <https://education.nationalgeographic.org/>
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(Analysed for 2 years and extended validity for 1 year, thus total 3 years)

The Loyola College Society's

## **Andhra Loyola College (Autonomous)**

Door No. 54-16-14, Govt. Polytechnic Post, Vijayawada - 520 008, Andhra Pradesh, India

*(Site visit held on 13 February 2024)*

As part of the Institution's initiatives for a Healthy & Sustainable College the audit was conducted.  
We appreciate the immense efforts taken by Staff and students towards the Environment Protection and Conservation.

Issued on **Tuesday, 13 February 2024** valid till **31 January 2025**

  
**Ar. Nahida Shaikh**

Architect, IGBC Accredited Professional, ISO Certified I. A. (IMS)  
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