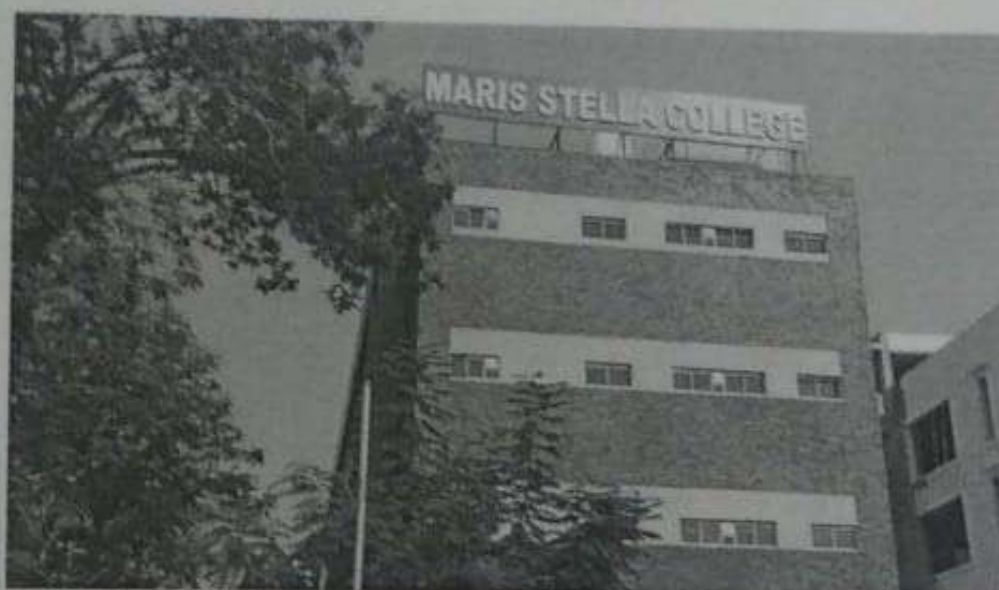




MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAWADA

A College with Potential for Excellence

NAAC Accredited & ISO 9001: 2015 Certified



**REPORT ON
ENVIRONMENT AND ENERGY AUDIT**

2022 - 23



Institution : Maris Stella College (Autonomous)
Address : 59A-1-4, Maris Stella College, NH 16 Service Road, Benz
Circle, Vijayawada, PIN: 520008
Nature of Business : Educational Institute
Certification Body : HYM International Certifications Pvt. Ltd.
Accredited by : ASCB (E)
Name of Standards : ISO 14001: 2015 (Green Audit)
ISO 50001: 2018 (Energy Audit)
Audit Date : 16.02.2023
No. of man days : 2 man days
Name of Auditor
Team Lead Auditor : Sivaiah Alapati
Team Members : Suma Devi. T
Certificate Type : Initial Certification
Observations : 2
Recommendations : 2
Non-conformities : 0



Introduction

In today's world it is observed that environmental consciousness is of paramount importance and educational institutions worldwide are pioneering initiatives towards sustainability. One such remarkable endeavour is the establishment of green campuses. These campuses not only serve as centers of learning but also as living laboratories for sustainable practices. A Green Campus is a place where environment friendly practices are adopted, promoted and practiced for sustainable growth and development. This green campus idea provides a blueprint for an institution in building and integrating its eco-friendly measures. Green campuses encompass the ideas of improving the green cover, effective solid and liquid waste management systems, and structured energy management systems, propagating the concept of "reduce, reuse, and recycle", supporting the purchase of eco-friendly supplies, and a total ban on plastics. Overall, a green campus serves as a model for environmental stewardship and inspires students, faculty, staff, and the broader community to adopt sustainable practices and contribute to a healthier planet. By prioritizing sustainability, these campuses not only reduce their environmental impact but also promote social responsibility and contribute to the well-being of future generations. The execution of these require a set of initiatives which need to be implemented and reviewed over a fixed time period. At this juncture environment audit plays a crucial role in examining an institution's policies and practices and also identifies areas of improvisation. Environment audit is a useful tool for an institution to determine how and where they are using most energy or water or resources so that the college may then consider how to implement changes and make savings. An environmental audit is a comprehensive evaluation of an organization's operations, processes, and practices to assess their compliance with environmental regulations, identify areas of improvement, and minimize ecological impact. It involves examining factors such as resource consumption, waste generation, pollution levels, and adherence to environmental policies and standards. It provides staff and students better understanding of green impact on campus. The environment audit also tries to coordinate the environment, economic and social dimension among the stakeholders of an institution. Overall, environmental audit serves as a vital tool for organizations to assess, manage, and improve their environmental performance, thereby contributing to the protection of the environment and the sustainability of future generations.

Objectives

- To map geographical location of Maris Stella College
- To document the soil conservation strategies of Maris Stella College
- To document the water conservation strategies of Maris Stella College
- To document the biodiversity conservation with reference to fauna and flora
- To document the ambient environment in the campus with reference to energy conservation

About the College

Maris Stella College is a Catholic Christian Minority institution of higher education for women, under the direction of the Franciscan Sisters of Mary. Maris Stella College was founded on 16th July, 1962 to become the first college set up with the express mission of educating young women to be intellectually, morally, socially and spiritually sound, to be equipped to contribute positively to family, community and nation and to become torch-bearers of an equitable society. Maris Stella College strives to enable students to grow into socially aware and responsible citizens. The college is blessed with a vast campus with abundant green cover and home to a variety of indigenous species of fauna and flora. Maris Stella College has a Green Policy which seeks to conserve resources and preserve the environment by harnessing the sun, catching the rain, providing green cover and managing and restoring from waste. The institution's guiding principles and practices to achieve resource conservation, waste reduction, and sustainability overall are summarized below:

- Conserve energy and other natural resources
- Encourage employees to use public transport/ environment-friendly modes of travel
- Reduce, reuse, and recycle to reduce waste
- Minimize the production of hazardous waste
- Adopt green procurement practices
- Ensure staff and students complete the environmental awareness training
- Continue to review and minimize the impacts of our activities

About the Auditing Agency

HYM International Certifications Private Limited, Hyderabad was established in the year of 2012 HYM International Certification Hyderabad and is accredited by Accredited Services Certifying Bodies (United Kingdom) London. The vision of HYM is "Right Path for Training and Certification on ISO Standards". The team consisting of Mr. Sivaiah Alapati as Team Lead auditor, and Ms.T. Suma Devi as Team Member visited Maris Stella College, Vijayawada on 16.02.2023 to conduct Environment and Energy Audit.

Biodiversity

Biodiversity or biological diversity is the variety and variability of life on Earth. Biodiversity is a measure of variation at the genetic (genetic variability), species (species diversity), and ecosystem (ecosystem diversity) level. Biodiversity is the different kinds of life we find in one area - the variety of animals, plants, fungi, and even microorganisms like bacteria that make up our natural world. Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life. Biodiversity supports everything in nature

that we need to survive: food, clean water, medicine, and shelter.

Tree Diversity

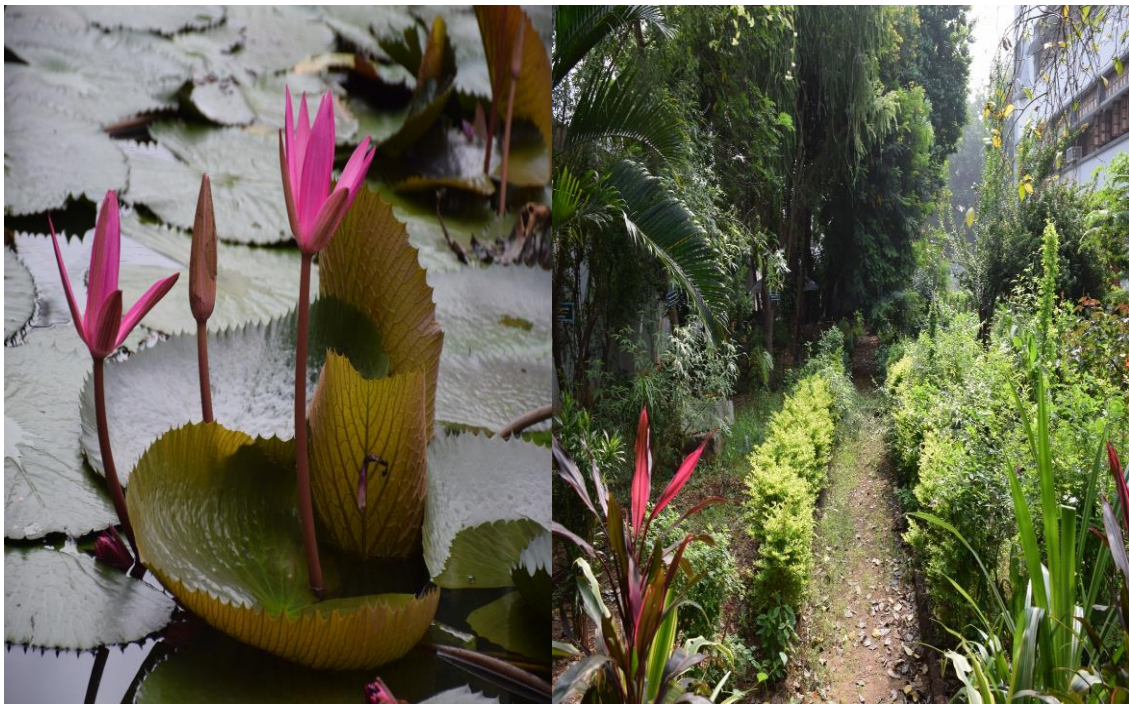
The sixty-year old college campus has more than 50 varieties of trees that have been documented by the Department of Botany.

More than 50 *Polyalthialongifolia* (Ashoka), 20 (Mimusopselengi) Pogada, 10 *Albizialebeck* (dirisina), 20 *Peltophorum* pterocarpum (pachha), 15, (Delonixregia), 10 *Azardirachtaindica* (Neem), 5 *Pongamiapinnata* (Ganugu), 40 *Ficus* species, 20 *Casuarina* trees 2 and 2 *Tectonagrandis* (Teak) trees are there on the campus. Among them 80% trees are wood yielding and the rest are ornamental.

A total of 50 families and 100 varieties of species are recognized in the campus. These plants absorb maximum CO₂ and produce maximum O₂. Commercial crops like rice (black rice), fruit yielding plants like banana, mango, sapota, guava, papaya, emblica, orange, and vegetable crops such as brinjal, ladies finger, chillies, cassava etc. and leafy vegetables such as amaranthus, mint, curry leaves, coriander, red sorrel etc. are cultivated on the campus.

The campus has five endemic (rare) species: *Rauwolfia tetraphylla*, *Adathoda vasica*, *Andrographis paniculata*, *Cycas revoluta* & *Asparagus racemosus*.

The college is committed to following sustainable development, habitat creation and erosion control like natural forests to fulfil the needs of local biodiversity and for the benefit of future generations.



Campus Biodiversity

The trees in the college campus are listed in Table-1 and the medicinal plants in Table 2.

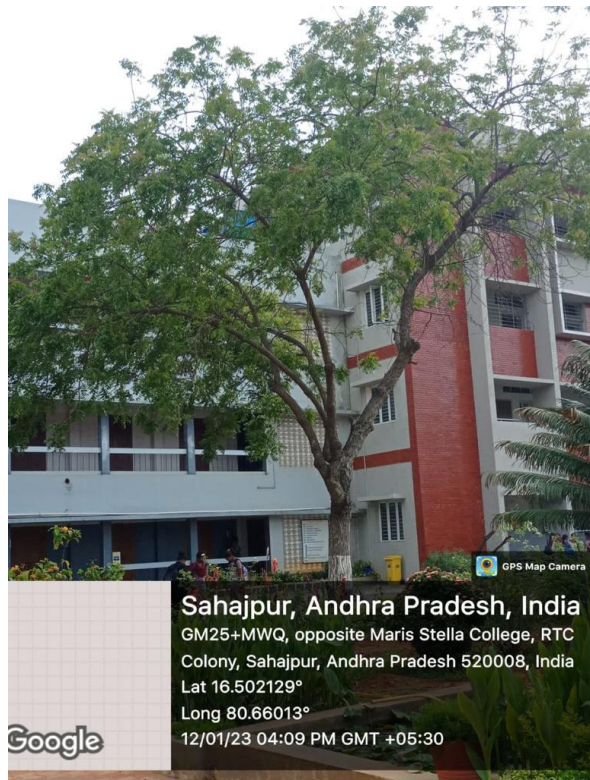
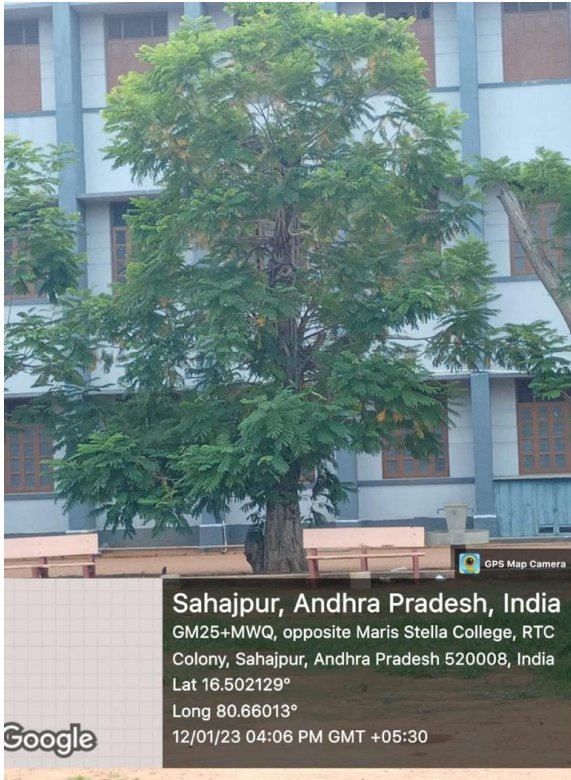
Table 1: List of Tree Species on Maris Stella College Campus

S.No.	Name of the Tree Species	Number	Common Name	Family
1	<i>Polyalthia longifolia</i>	50	Ashoka	Annonaceae
2	<i>Azadiracta indica</i>	10	Neem	Meliaceae
3	<i>Cassia fistula</i>	2	Golden shower	Fabaceae
4	<i>Pongamia pinnata</i>	8	Kanuga	Fabaceae
5	<i>Senna auriculata</i>	12	Tangedu	Fabaceae
6	<i>Albezzia lebek</i>	20	Albezzia	Fabaceae
7	<i>Eukalyptus</i>	2	Jamail	Myrtaceae
8	<i>Palms</i>	10	Areca Palm	Arecaceae
9	<i>Syzygium cumini</i>	20	Malabar Palm	Myrtaceae
10	<i>Musa paradisica</i>	100	Arati	Musaceae
11	<i>Moringa oleraceae</i>	20	Drumstick tree	Moringaceae
12	<i>Murraya koenigii</i>	20	Curry leaves	Rutaceae
13	<i>Ficus religiosa</i>	10	Raavi	Moraceae
14	<i>Annona reticulata</i> (ramaphalam)	50	Ashoka	Annonaceae
15	<i>Psidium guajava</i>	6	Jaama	Myrtaceae
16	<i>Punica granatum</i>	2	Pomegranate	Lythraceaea
17	<i>Terminalia arjuna</i>	2	Tella maddi	Combretaceae
18	<i>Emblica phyllanthus</i>	8	Amla	Phyllanthaceae
19	<i>Mangifera indica</i>	30	Mango	Anacardiaceae
20	<i>Nerium oleander</i>	20	Nerium	Apocynaceae
21	<i>Courouptia guinensis</i>	1	Cannon ball tree	Lecythidaceae
22	<i>Butea monosperma</i>	2	Fire of the forest	Fabaceae
23	<i>Manilkara zapota</i>	20	Sapota	Sapotaceae
24	<i>Annona squmosa</i>	4	Seethaphalam	Annonaceae
25	<i>Annona reticulata</i>	1	Ramaphalam	Annonaceae

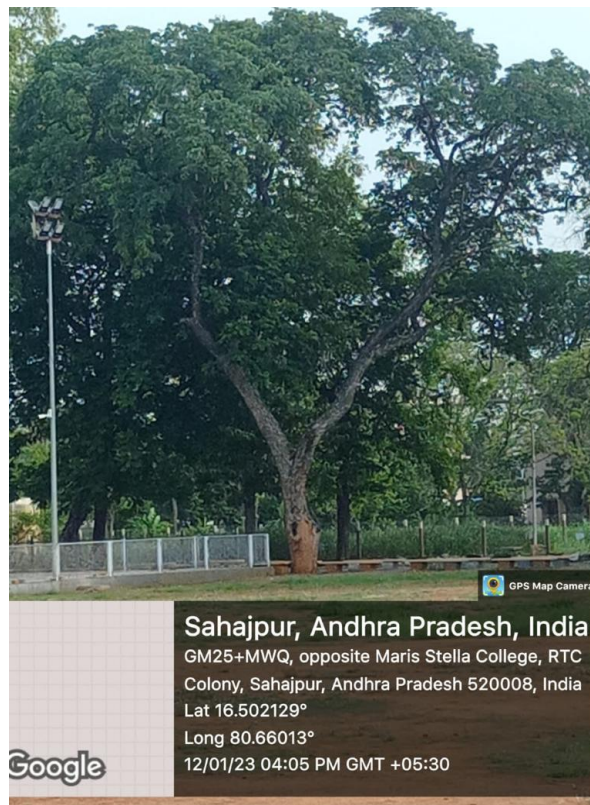
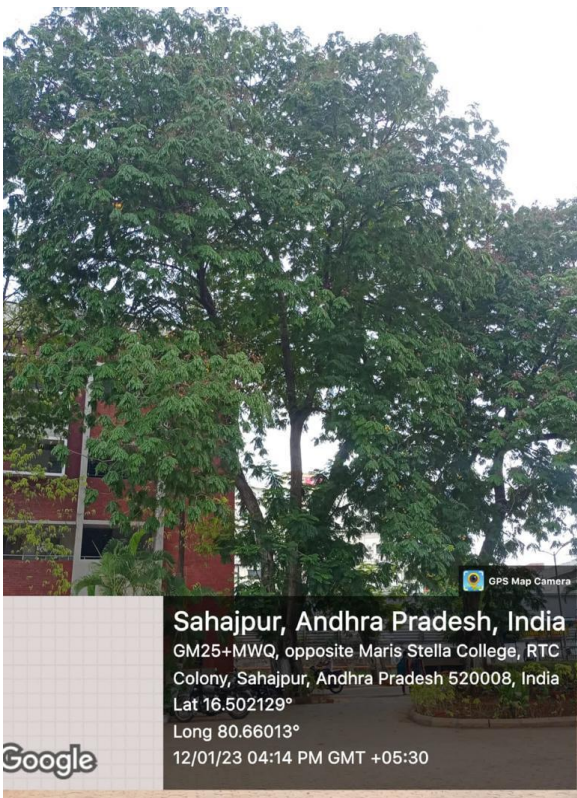
Table 2: List of Medicinal Plant Species in Maris Stella Campus

S. No	Name of the Tree Species	Family Name	Common Name
1	<i>Azadirachta indica</i>	Meliaceae	Vepa
2	<i>Abutilon indicum</i>	Malvaceae	Tutturubenda
3	<i>Acalypha indica</i>	Euphorbiaceae	Muripinda
4	<i>Achyranthus aspera</i>	Amaranthaceae	Uthareni
5	<i>Aloe vera</i>	Liliaceae	Kalabandha
6	<i>Alternanthera sessilis</i>	Amaranthaceae	Ponnagantikura
7	<i>Araca catechu</i>	Arecaceae	Poka
8	<i>Artocarpus integrifolia</i>	Moraceae	Panasa
9	<i>Boerhaavia diffusa</i>	Nyctaginaceae	Atakamamidi
10	<i>Calotropis gigantea</i>	Ascladiaceae	Gelladu
11	<i>Carica papaya</i>	Caricaceae	Boppai
12	<i>Cassia auriculata</i>	Cesalpiniaceae	Boppai
13	<i>Cassia fistula</i>	Caesalpiniaceae	Tangedu
14	<i>Catheranthus roseus</i>	Apocynaceae	Billaganneru
15	<i>Cathranthus alba</i>	Apocynaceae	Billaganneru
16	<i>Ceiba pentandra</i>	Bombacaceae	Buruga
17	<i>Ciccaacida</i>	Euphorbiaceae	Vusirikia
18	<i>Citrus aurantium</i>	Rutaceae	Naringa
19	<i>Citrus lemon</i>	Rutaceae	lemon
20	<i>Cleome viscosa</i>	Capparidaceae	Vomitlu
21	<i>Cymbopogon spp</i>	Poaceae	Bodagaddi
22	<i>Datura metel</i>	Solanaceae	Vumetha
23	<i>Eclipta alba</i>	Asteraceae	Guntagalalagara
24	<i>Eucalyptus globosa</i>	Myrtaceae	Zamoil
25	<i>Euphorbia hirta</i>	Euphorbiaceae	Pachabotlu
26	<i>Euphorbia tirucalli</i>	Euphorbiaceae	kadajemudu

27	<i>Ficusrecemosa</i>	Moraceae	Medi
28	<i>Ficusreligiosa</i>	Moraceae	Raavi
29	<i>Ficusbenghalensis</i>	Moraceae	Marri
30	<i>Gossypiumarboreum</i>	Malvaceae	Pathi
31	<i>Hibiscus rosasinensis</i>	Malvaceae	Mandara
32	<i>Jatrophabellodona</i>	Euphorbiaceae	Nephalun
33	<i>Lawsoniainermis</i>	Lythraceae	Gorinta
34	<i>Mangiferaindica</i>	Anacardiaceae	Mamidi
35	<i>Moringatinctoria</i>	Moringaceae	Munaga
36	<i>Murrayatinctoria</i>	Moringaceae	Mumaga
37	<i>Ocimum sanctum</i>	Lamiaceae	Tilasi
38	<i>OcimumBassilicum</i>	Lamiaceae	Sabja
39	<i>Phyllanthusneruri</i>	Euphorbiaceae	Nelavusire
40	<i>Phyllanthusemblica</i>	Euphorbiaceae	Nelavusire
41	<i>Physalis minima</i>	Eyphoribiaceae	Vusirika
42	<i>Pongamiapinnata</i>	Fabaceae	Kanuga
43	<i>Pongamialongifolia</i>	Fabaceae	Kanuga
44	<i>Psidiumguagava</i>	Myrtaceae	jama
45	<i>Punicagranatum</i>	Punicaceae	Denemma
46	<i>Ricinuscommunis</i>	Euphorbiaceae	Aamundam
47	<i>Sidacordifolia</i>	Malvaceae	Aribala
48	<i>Syzygiumcumini</i>	Myrtaceae	Neredu
49	<i>Tamarindusindica</i>	Cesalpinaceae	Chinta
50	<i>Tephrosiapurpuria</i>	Fabaceae	Vempalli



Trees decorating the campus which have stood the testimony of time



Trees decorating the campus which have stood the testimony of time

Faunal Diversity

India, an acclaimed mega-biodiversity nation, represents about 6.4% of the total global fauna in its share of only 2.4% of the total land surface of the world. Biogeographically, the country is divided into ten different biogeographic zones: Trans Himalaya, Himalaya, Desert, Semi-Arid, Western Ghats, Deccan Peninsula, Gangetic Plains, Northeast, Islands, and Coasts. The Indian Himalaya (IH) with a total area of 3, 95,485 sq. km. comprised of 2 biogeographic zones including 7 biotic provinces

1. Trans Himalaya (Ladakh Mountains: 1A, Tibetan Plateau: 1B, Sikkim: 1C)
2. Himalaya (North-West: 2A, West: 2B, Central: 2C and East: 2D)

Despite being one of the global biodiversity hotspots of the world, so far no attempt has been made to catalogue the faunal diversity of the extant species reported from Maris Stella College, Vijayawada.

India is one of the hotspot for biodiversity owing to its versatile and endemic distribution of flora and fauna. Keeping in view of the immense biodiversity potential, a large network of Indian Biosphere reserves, National parks, Wild life sanctuaries and sacred grooves vested for the conservation and sustainability of valuable biodiversity.

The geographical and ecological ambits under which Maris Stella College categorically falls are Deccan plateau, Coastal Andhra (central). Central Coastal Andhra is blessed with wide variety of fauna. Maris Stella College which is located in the proximity of Krishna River has a prevailing variety of fauna ranging from annelids to insects (under Invertebrates) and amphibians, reptiles, birds to mammals (under Vertebrates). Owing to the climatic, terrestrial and local atmospheric favorability, the common fauna habituating in the Maris Stella College campus was tabulated.

The following table contains the fauna which is commonly in habituating in the region in general, and Maris Stella College in particular. Insects are widely prevailing fauna in the campus in terms of number of species habituating in the campus.

1	Vertebrates	Fishes
2	Amphibians	<i>Hoplobatrachus tigerinus, Duttaphrynus melanostictus</i>
3	Reptiles	<i>Hemidactylus</i>
4	Mammals	<i>Canis lupus familiaris, Bonnet macaque</i>
5	Birds	<i>Columba livia, Corvus splendens, Psittaciformes</i>

Mega Plantation Drive

With the intent of increasing the green cover, the Department of Botany organized a mega plantation drive as a part of “Azadi ka Amrit Mahoutsav” in the campus on 15.08.2022 with the theme, “The best time to plant a tree is just now”. 300 students took active part in this programme in which 200 herbs and 50 shrubs were planted. Pollution control plants like Chlorophytum, Acalypha and Ixora plants were extensively planted during this drive.



Faculty & students of Departments of Botany & Biotechnology who took part in the Programme



Chief Guest Ms. Panabaka Rachana and Correspondent Sr. Sleeva Thumma, Principal Sr. Jasintha Quadras planting the saplings

Soil Management

Soil conservation is the practice of protecting the soil against erosion, degradation, and depletion. It's crucial because soil is a finite and essential resource for agriculture, biodiversity, and ecosystem health. This practice must retain the core nutrients of the soil treating it as a living ecosystem which in turn will rejuvenate the soil strength. Soil conservation involves erosion control, sustainable agriculture, land management, and soil restoration. Soil conservation is the need of the day as it protects the loss of this natural resource and improves agricultural production. To sum up, soil conservation is essential for maintaining soil health, preserving ecosystem integrity, and ensuring sustainable land use for future generations. By implementing effective conservation strategies and promoting stewardship of our soil resources, we can mitigate soil erosion, enhance agricultural productivity, and safeguard the environment.

Maris Stella College has adopted organic vermicomposting practice for soil conservation.

Organic Vermicomposting

The primary goal of vermicomposting is to generate high-quality organic fertilizer for nutrient-deprived soil using a variety of waste materials from college campuses, including plant refuse, agricultural leftovers, garden debris, office paper, hostel kitchen scraps, and canteen waste. These materials are typically discarded, leading to unsightly waste buildup. By recycling this biodegradable waste, vermicomposting produces nutrient-rich compost, replenishing soil fertility and enhancing agricultural productivity. This process is straightforward, cost-effective, environmentally friendly, and contributes to sustainable land management practices.

Benefits

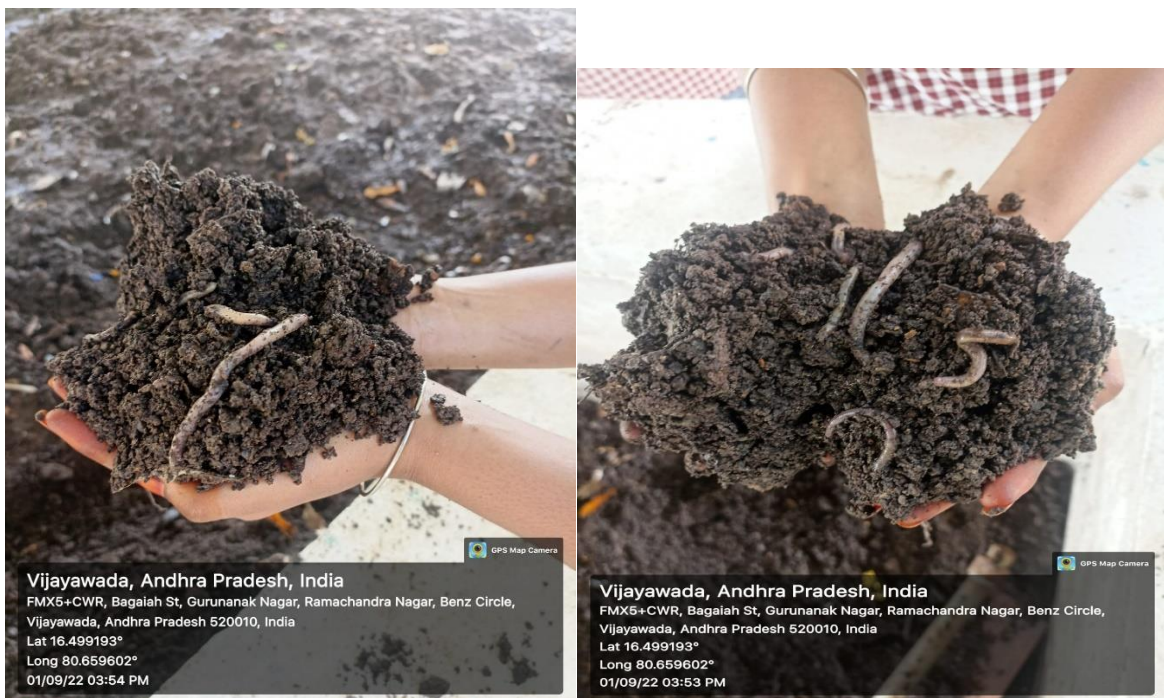
The students of B.Sc. Agriculture & Rural Development are involved in the preparation of organic vermicompost. So, this practice acts as an awareness tool for students about the eco-friendly method of waste management and as a provider of fertilizers to the college garden. The organic composting addresses many environmental problems by conditioning the soil with compost, creating rich humus for lawn and garden. This process adds nutrients to the plants and helps retain moisture in the soil.

Solid waste management is facilitated through vermicomposting, whereby office paper waste, campus green refuse, kitchen, and canteen waste undergo decomposition. This organic composting process introduces beneficial organisms to the soil, including microscopic organisms like saprophytic microorganisms, which aerate the soil and break down organic material for plant utilization. Segregating campus waste into plastic waste, wet waste, and dry waste, and converting dry and wet waste into compost, achieves the dual objective of recycling waste within the campus and mitigating pollution through an eco-friendly method.

1. The college has constructed two permanent chambers for solid waste management and vermicomposting in the college campus. First unit is of 9 ft. length, 9 ft. width, and 5 ft. deep, which is about 2 ft. above ground level to avoid entry of rainwater into the chambers for solid waste decomposition. The college campus waste like agricultural waste, botanical garden waste, office paper waste, hostel kitchen waste, canteen waste, and animal farms waste are dumped in this pit for recycling.

2. The second unit is of 12 ft. in length, 4 ft. in width, and 2 ft. in depth, which is about 2 ft. above ground level to avoid entry of rainwater into the chambers. In this pit solid waste decomposed material is dumped. *Eisenia foetida* (Red Worms), *Eudrilus eugeniae* (Night crawler) and the native species *Perionyx excavates* of the earthworms are added to the decomposed material in the second pit for vermicomposting as this species has high conversion ratio.

Vermicomposting is an advantageous technology for solid waste management. Vermicomposting results in earthworms and vermicompost products. The vermicompost can be used as bio-fertilizers whilst the earthworms can be used for further vermicomposting.



Students releasing earthworms into the soil for vermicomposting

Shade Net Structures

The Department of Agriculture and Rural Development established 75% shade net structure in the campus on 12.03.2021 to provide a standardized environment to measure temperature, humidity, dew point and atmospheric pressure with the following objectives

Objectives

- To create and provide a demonstration and practical unit for the students doing agriculture
- To increase the production and supply of quality vegetable to the community
- To generate additional income by sale of vegetables.

Shade net structures provide favourable environment for the crop growth there by achieving greater yield and high-quality produce. Students gain hands on training in monitoring the different climatological parameters *i.e.* maximum and minimum temperature, relative humidity, vapour pressure in shade net houses as well as open field. The main agricultural applications of shade net covered structures are: protection against meteorological hazards, insects, and little animals; reduction of solar radiation; and soil covering. Nets are also used for harvesting fruits, vegetables and flowers.



Construction of shade net in the campus on 06.03.2021



Completed shade net structure

Polyhouses

The Department of Agriculture and Rural Development established 75% shade net structure in the campus on 16.07.2022 with following objectives

Objectives

- To study the progress in providing assistance for establishing the polyhouse for the cultivation of flowers and vegetables.
- To examine the expenditure incurred in establishment of polyhouses for cultivation of flowers and vegetables under protected conditions.

Polyhouse is a type of greenhouse where specialized polythene sheet is used as a covering material under which the crops can be grown in partially or fully controlled climatic conditions. Polyhouses are more suitable for tropical and subtropical region like India.



Construction of polyhouse in the campus on 01.08.2022



Preparation of seed bed inside the polyhouse



Construction of vertical garden in the polyhouse

Preparation of Biofertilizers: Waste to Wealth

Biofertilizer is the formulation of living microbes that fix the atmospheric nitrogen either by living freely in the soil or by associating symbiotically with the plant. Its commercial production is cost-effective and relatively inexpensive to buy. The Departments of Botany and Biotechnology taught the students the preparation solid and liquid biofertilizers.

The trained students prepared them in a phased manner and distributed the fertilizers to the farmers in Undavalli region.



Preparation of solid & liquid biofertilizers by the students



Students distributing the solid & liquid biofertilizers to the farmers of Undavalli

Water Conservation

Water, the paramount natural asset crucial for sustenance, underscores the imperative of judicious consumption and preservation. Embracing water reuse stands as a pivotal strategy in curbing its misuse and squandering, encapsulating the essence of water conservation. This ethos entails the adept preservation, regulation, and stewardship of water resources.

The institution practices rainwater harvesting which recharges the bore wells in the campus and also helps in water conservation. The college collects and stores rain water running down the roof top, logged on the road, and in the college playground Rainwater harvesting contributes to replenishing groundwater and enhances the water table, augmenting both the quality and quantity of groundwater. Implementing rainwater harvesting becomes imperative in areas where groundwater exhibits salinity or elevated levels of iron or fluoride.

There are five rain harvesting pits in the campus and each pit is 5 ft. in length, 5 ft. in width, and 10 ft. in depth. Water collected in the rain harvesting pit adjacent to the Indoor Stadium is used for agricultural purposes and the water stored in the second pit is used for aquaculture.

The institution has a mechanism in place for the rainwater collected on the rooftop of the main building which is drained through pipes into the rainwater harvesting pit adjacent to the examination section.



Traditional soil puddling with harvested rainwater



Using harvested rainwater for agricultural purposes

Water Meters

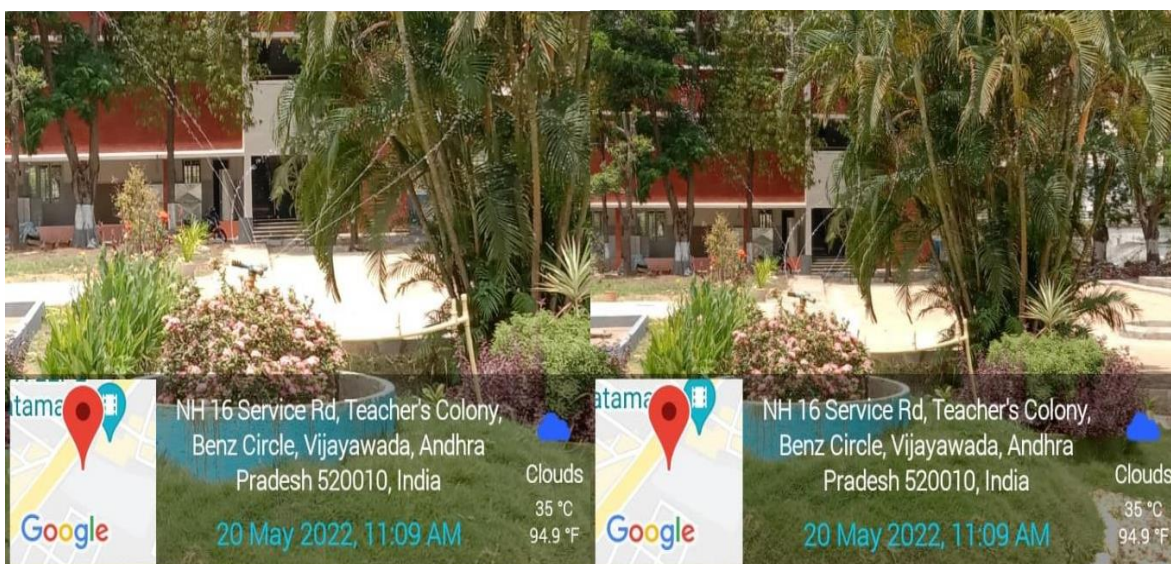
Water meters serve as vital tools for measuring and monitoring water consumption in residential, commercial, and industrial settings. These devices accurately gauge the volume of water passing through a system, enabling precise billing, leak detection, and conservation efforts. With advancements in technology, modern water meters offer enhanced efficiency and data collection capabilities, empowering consumers and utility providers alike to make informed decisions regarding water usage and management. The college has water meters for the judicious use of water.



Water meters in the campus

Water Efficient Irrigation System

A water-efficient irrigation system is a sophisticated method designed to optimize water usage in agricultural, landscaping, and gardening practices. By employing advanced technologies and strategic planning, these systems aim to deliver water precisely where and when it is needed, minimizing waste and maximizing plant health. From drip irrigation to precision sprinkler systems, these methods utilize sensors, timers, and control mechanisms to adjust water flow based on factors such as soil moisture levels, weather conditions, and plant requirements. As the demand for sustainable water management grows, water-efficient irrigation systems play a crucial role in conserving this precious resource while maintaining productivity and environmental stewardship. The institution has sprinkler system to handle the gardening purposes.



Sprinkler system in the campus

On the occasion of World Water Day, the Department of Chemistry performed Water Analysis on 21.03.2023 on 20 water samples of potable groundwater for their pH, alkalinity, total hardness, and conductivity.

Energy Conservation

Energy conservation refers to the deliberate and strategic reduction of energy consumption without compromising on comfort, productivity, or quality of life. It involves adopting practices, technologies, and policies aimed at optimizing energy use across various sectors, including residential, commercial, industrial, and transportation. Through measures such as improving insulation, upgrading to energy-efficient appliances, optimizing lighting systems, and implementing smart building designs, energy conservation helps reduce greenhouse gas emissions, mitigate climate change, and alleviate strain on finite energy resources.

By promoting sustainability and cost savings, energy conservation plays a pivotal role in shaping a more resilient and environmentally conscious society. Educational institutions play a major role in it as they can sensitize the students in this regard. In this regard Maris Stella College has adopted the following responsibilities towards energy conservation. They are

- Turn off lights when not in use and use natural light when possible.
- Turn off all computers, terminals, speakers and other office equipment at the end of every work day.
- Activate the power down features on the computer and monitor to enter into a low-power or sleep mode when not in use.
- Unplug equipment that drains energy even when not in use (e.g., cell phone chargers, fans, desktop printers).
- Use LED lighting wherever possible.
- Utilize video conferencing and conference calls as an alternative to travel when possible.
- Limit the use of air conditioners.

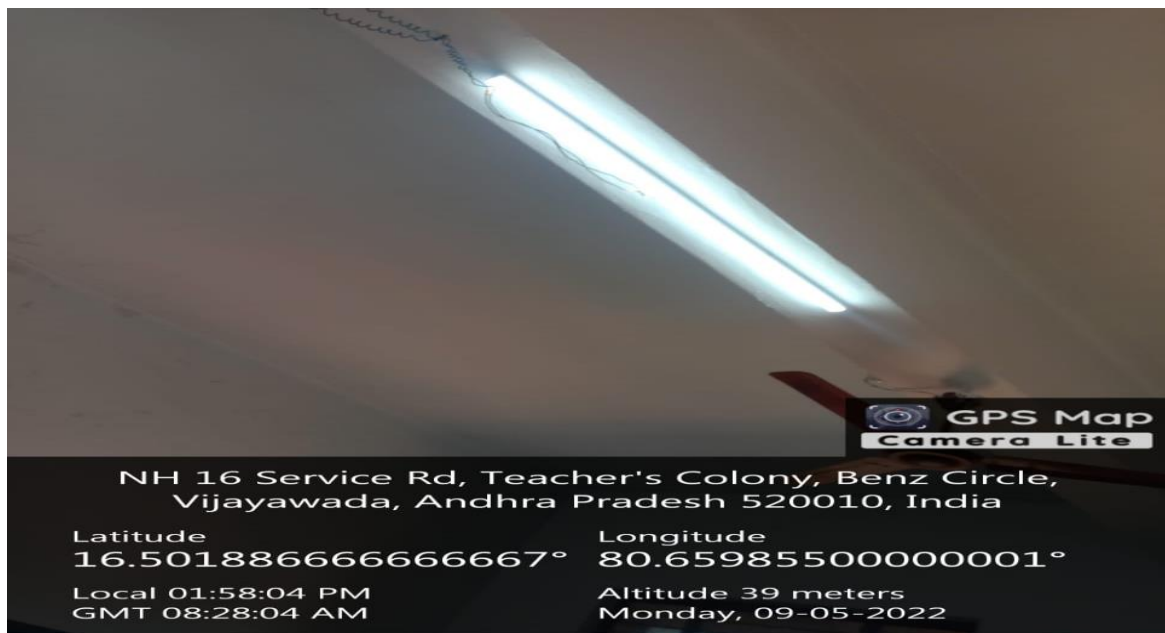
At this juncture energy audit is essential as it recommends ways to implement renewable energy systems and energy efficiency enhancement technologies thereby reducing the overall carbon footprint. Energy audit consists of: scout energy consumption in the organization, find scope for saving, identify the most likely areas for attention as well areas of improvement/ savings, and set a reference point.

Given below are the energy consumption details at Maris Stella College:

Heavy consumption areas are auditorium, office, examination section, computer labs, and audio-visual room, new conference room. Medium consumption areas are the classrooms, physics lab, biotechnology lab, food science and technology lab, English language lab, RUSA lab, conference room, canteen, board room, and indoor stadium. Low consumption areas are chemistry lab, electronics lab, zoology lab, and botany lab, Bonaventure block, Helen block, Francis block, and Claire block.



Auditorium



Room No. MI-8

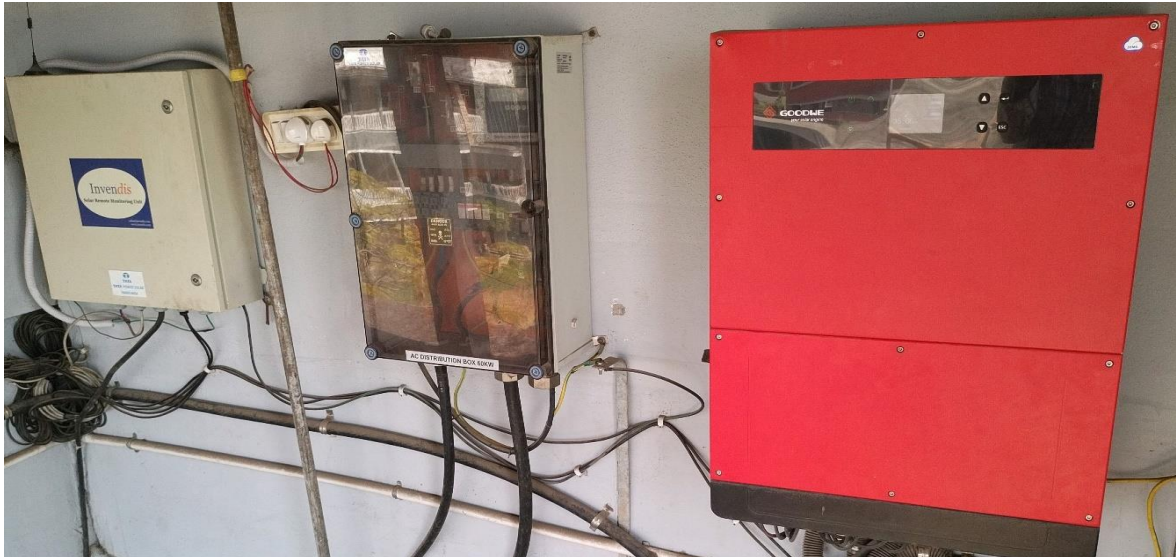
The institution generates solar energy as a part of its idea to switch to renewable form of energy. There are 169 solar panels fixed over the roof top the main block to generate solar energy. The details of the solar panels is given below:

Company Name : TATA Power Solar
 Inverter Purchased from : TATA Power Solar
 Inverter Capacity : 50K
 Inverter Model : GW50K-MT
 Inverter Serial Number : 9050KMTS187R0015
 Inverter Installation date : FEBRUARY - 2019
 End customer Name : Dr. Sr. Jasintha Quadras, Principal
 Site Address : Maris Stella College,
 NH-16 Service Road, Benz Circle,
 Vijayawada – 520 008
 Support Required : Technical Person to get the data
 Contact Name : Mr. Prasad, IT Admin

The solar panels are cleaned periodically and maintained in good condition. Due to the second wave of as classes were conducted in online mode the institution was able to contribute power to the grid as less electricity was consumed and also had surplus power through solar energy.



Solar panels on the rooftop of the main block



Solar Power Grid

**MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAAWADA
COMPARATIVE STATEMENT FOR METER NO 6512305000312**

Electricity and Solar reading April 2022 to March 2023

Months	KVAH			Solar			Net difference
	Present	Previous	Difference	Present	Previous	Difference	
Apr-22	29393	24649	4744	478	4578	580	4164
May-22	32763	29393	3370	478	5637	879	2491
Jun-22	37100	32763	4338	5637	6246	609	3729
Jul-22	39086	37101	1985	0	7028	782	1203

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A.P.C.P.D.C.L., Patamata, Vijayawada

Electricity & Solar reading issued by the Electricity Department

Sensitization Programmes for Students

Maris Stella College formed “Eco Ambassadors of Green Club” in 2021 to sensitize students about ecofriendly practices, to promote environmental awareness, and to nurture green consciousness among them so that they as ambassadors spread the advantages of ecofriendly living. The following activities were organized by the Eco-Ambassadors of Green Club

- An event was organized on March 21, 2023, in the college's auditorium to commemorate "The World Water Day" with the theme "Accelerating Change." The event was held on March 21 due to Ugadi. The purpose of the celebration was to raise awareness about the vital role of water in preserving all life on the planet and to sensitize young people about the growing water problems and their impact on the future. The event aimed to educate students about the significance of responsible consumption and the adoption of sustainable water management practices.



Students singing a song in praise of water and creation

- In collaboration with the Future Recyclers Foundation, Mumbai, an online workshop titled "Sustainable Electronic Waste Management" was organized on 22.02.2023 from 3:00 pm to 4:00 pm. The workshop aimed to educate students about responsible consumption and the adoption of sustainable e-waste management practices. Ms. Shriya Pitre, Manager of Re Teck, Mumbai, was the resource person and discussed the impact of irresponsible consumption and disposal of electronic waste on human and environmental health. She shared alarming statistics about the amount of e-waste generated globally and the vulnerability of children and poor people who are exposed to hazardous materials present in these devices such as Lead,

Mercury, Chromium, Cadmium etc., during segregation. She motivated students to repair and reuse electronic gadgets instead of buying numerous electronic devices and suggested methods of safe and environmentally friendly segregation, storage, re-use, recycling, and disposal of e-waste.



Students attending the online workshop on e-waste management on 22.02.2023

- To promote Gandhian values of environment, in collaboration with “WOW” - Wellness out of Waste, conducted a greening and plantation drive in Municipal Park in Guru Nanak Colony, Vijayawada on 01-10-2022 from 7.30 a.m. to 10.00 a.m. 14 Eco-Ambassador students with a faculty participated in it.



Students with a decorated plant & weeding different parts of the garden

- Eco-ambassadors of the Green Club interacted with Frederick De Gryse, Patrizia Civetta, the founders of Social Ecology Education Fund, Brussels who visited Maris Stella College on 02.08.2022. They created awareness about sensitive issues like climate change and expressed the need to reverse this situation by doing simple things individually but responsibly. Dr.Fr.Don Bosco, Director, Thalithakumi Unnati, Vijayawada and Shri Ray Kancharala, Climate Activist, Humanitarian & Development Strategic Planner who are mentors guiding and extending great support in executing activities connected to Eco Ambassadors Club were also present.



Felicitation of the guests, Frederick De Gryse and Patrizia Civetta

Observations

The audit team made two observations during their visit to Maris Stella College. The team lauded the efforts of the college in treating the grey water generated in the campus through bioremediation process for reuse towards gardening purposes implemented by the Department of Agriculture and Rural Development. The team commended the sincere and consistent efforts of the college in increasing the green cover in the campus and energy efficiency practices by increasing the low energy fixtures through installation of LED lighting systems. They also praised the stupendous endeavours of the Eco-Ambassadors of Green Club in the implementation of green initiatives through student centric activities/programmes.

Recommendations

The audit team suggested two improvements during their visit to Maris Stella College. The team advised the institution to strengthen the college – community engagement in executing the green initiatives and sustainable practices through community service and service learning programmes for the realization Sustainable Development Goals (SDGs) 6, 7, 12, and 13. They recommended strongly to interact with the neighborhood communities at regular intervals in popularizing the concept of clean and green environment, judicious use of natural resources, and the need for adopting sustainable practices. The team suggested the management to upgrade and evaluate the soil testing and water analysis procedures.

Conclusion

The audit team complimented the meticulous efforts of the institution in improvising mechanisms to improve air quality and soil strength, efficient energy and water management practices, and preserving the campus biodiversity. The audit team suggested the management to adopt and implement simple and effective solid and liquid waste management measures. They welcomed the efforts of the students in reaching out to the society by celebrating World Water Day, World Earth Day, and World Environment in a novel manner.

