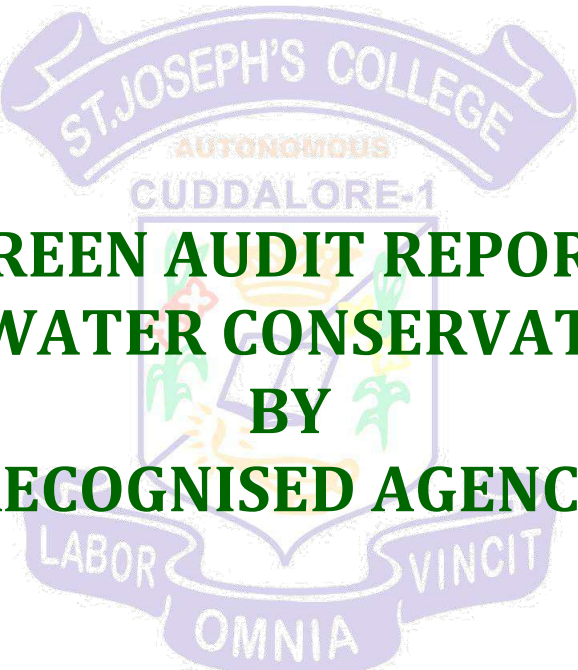




**St. Joseph's College of Arts & Science (Autonomous)**  
Cuddalore – 607 001, Tamil Nadu.

E-mail : joseco127998@gmail.com  
Website: www.sjctnc.edu.in



**GREEN AUDIT REPORT  
ON WATER CONSERVATION  
BY  
RECOGNISED AGENCY**

# REPORT OF GREEN CAMPUS AUDIT

*Submitted to*

**ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)  
Cuddalore-607001,  
Tamil Nadu, India.**

**Date of Audit: 21/09/2024**



*Submitted by*

***Dr. Helen Roselene***  
**CQI-IRCA Certified**  
**EMS ISO 14001:2015**  
**LEAD AUDITOR**

# **GREEN CAMPUS AUDIT**

## **1. Preamble**

Green campus audit is a tool of environment management system which is used methodologically for protection and conservation of environment and sustenance of ecosystem. It creates environmental culture, develops sustainable solutions to environmental problems and provides solutions to various social and economic needs (APHA, 1981). It provides the concept of green building and oxygenated building which in turn useful to provide a healthy atmosphere to the stakeholders.

Green campus audit is a type of assessment to ensure that the Organization campus should be in greenish in terms of planting a large number of trees, herbs, shrubs, climbers and lawns in the campus which in turn not only to reduce the environmental pollution and soil erosion but also useful for biodiversity conservation, landscape management, proper water irrigation, natural topography and vegetation (Gowri and Harikrishnan, 2014). Similarly, in order to ensure the green campus, maintenance of eco-friendly campus which lead to environment neat and clean, solid-state management, recycling of water, disposal of sewage and waste materials including electronic and biomedical wastes, plastic use etc. should be followed efficiently in the organization campus for the benefit of stakeholders.

## **2. About the College**

St. Joseph's College is a legacy of the 19th century, handed down to us by the venerable fathers of the society of the Foreign Mission of Paris. Its nucleus was the St. Joseph's High School which was started in 1868 A.D. This School was elevated into a college in 1884 A.D. through the efforts of Father Tarbes and was affiliated to the University of Madras. The District- Gazetteer, South Arcot District, has recorded that the prime educational institution and the only college in the District in the 19th century was St. Joseph's College. The college was inaugurated on 11th October 1991, at a stately function presided over by His Excellency Bhisma Narain Singh, the then Governor of Tamil Nadu through the efforts of Rev. Fr. R. Ratchagar, the then Secretary of the College. The NAAC 3rd Cycle of Re-Accreditation with CGPA of 3.31 on seven point scale at "A" Grade was declared on 22nd February, 2017. Under the leadership of the present Secretary of the College Rev. Fr. Dr. M. Swaminathan our institution is marching towards excellence.

The College bears the Motto “**Labor Omnia Vincit**”, meaning “**Hard Work conquers All**”. With an abiding faith in the efficacy of her labours, the college strives hard to impart value based education aimed at the formation of the integral personality of the student. With the willing co-operation of parents and the whole hearted support of the public, the college hopes to march triumphantly in its noble endeavour.

A total of 2924 in Shift I, 1985 in Shift II (UG) and in PG a total of 534 students are studying in this academic year (2023-2024) and at present in the college the total number of 176 teaching staff and 80 non-teaching staff are working in the campus.

### 3. Audit Details

Date/Day of Audit : 21.09.2024, Saturday  
Venue of Audit : St. Joseph’s College of Arts and Science Cuddalore  
Audit type : Green Campus Audit  
Environment Audit  
Energy Audit  
Name of EMS Lead auditor : **Dr. Helen Roselene Thomas**  
**ISO 14001:2015 EMS Lead Auditor**

### 4. On site audit activities

The opening meeting was held with the Principal Dr. M. Arumai Selvam, Viceprincipals, IQAC members, Enviro club coordinator and other college staff members.



## 5. Site inspection

1. It is observed that how the environment is protected in the campus and the eco-friendly atmosphere is being given to the stakeholders.
2. It is assessed for the strengths and weaknesses of the auditee's management controls and risks associated in maintaining green campus facilities were recorded.  
Gathering audit evidence *i.e.*, collecting data and information from the auditee as per the audit protocol was carried out.
3. An exit meeting was conducted to explain the audit findings with Management Representatives and staff members along with audit team in brief.



### Exit Meeting with Rev.Fr. Secretary

## 6. Green Campus Audit Observations

### 6.1. Flora and Fauna in the Campus

Ensuring the rich biodiversity in the green campus is an important parameter which reflected the real-time ecosystem. Plants are indicators for assessing the varying levels of environmental quality. In general, plants improve the outdoor air quality with increased oxygen levels and reduced temperature and carbon-di-oxide. The green and varying colour of the flowering plants improve the ambience of the environment. The record on maintenance of the plant biomass and its management are important with respect to green campus initiatives.



The existence of such plants and birds in the green campus maybe recorded for the rich flora and fauna which are being considered as a value addition to the campus.



**The shaded trees and rich bio diversity in between path ways are meaningful lineaments to the green campus**

The observations indicated that in the college campus, the commonly available native as well as wild plant species are Banana (*Musa indica*), Radish (*Raphanus sativus*), Tomato (*Solanumlyco persicum*), Brinjal (*Solanumm elongena* L.), Coconut tree (*Cocos nucifera*), Indian Gooseberry (*Phyllanthus emblica*), Fig Fruit (*Ficus carica*), Papaya (*Carica papaya*), Mango (*Mangifera indica*), Malabar plum (*Syzygium cumini*), Indian Almond (Terminalia catappa), Areca Palm (*Areca catechu* L.), Periwinkle (*Catharan thusroseus*), Spider plant (*Chlorophytum comosum*), Flame of the woods (*Ixora coccinea*), Neem (*Azadirachta indica*), Doub palm (*Borassus flabellifer*), Miniature Allamanda (*Allamanda schottii*), Moses in the cradle (*Tradescantias pathacea*), Oleander (*Nerium oleander*).

The predominant families of various monocot and dicot plants found in the college campus are *Musaceae*, *Brassicaceae*, *Solanaceae*, *Arecaceae*, *Phyllanthaceae*, *Moraceae*, *Caricaceae*, *Anacardiaceae*, *Myrtaceae*, *Combretaceae*, *Apocynaceae*, *Asparagaceae*, *Rubiaceae*, *Meliaceae*, *Commelinaceae*.

The visiting and living birds in the campus are Crow (*Corvus splendens*), Pigeon (*Columba liviadomestica*), Birds (*Aves*), Garden lizard (*Calotes versicolor*), Butterfly (*Euploea core*), Squirrel (*Sciurus sp.*)and Carpenter ants (*Camponotus sp.*).

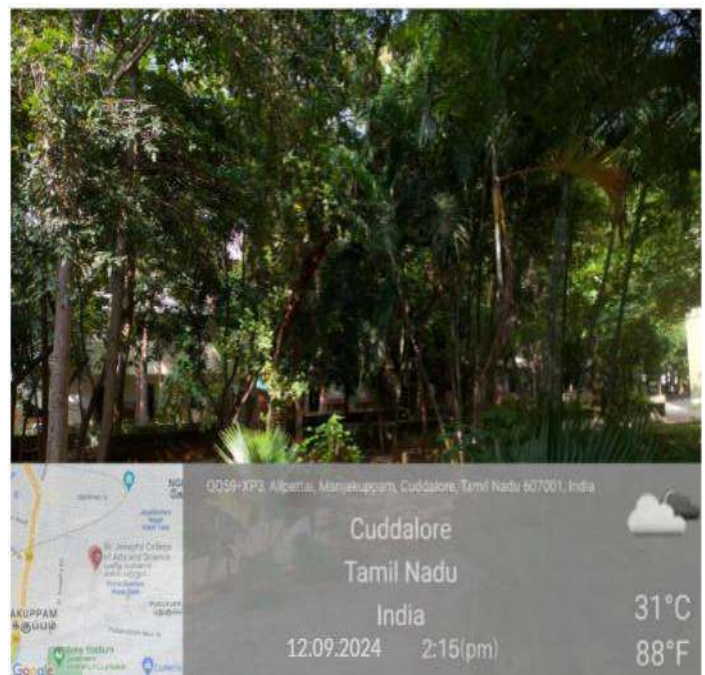
**COCONUT GROOVE- BACK OF TARBUS BLOCK**

**DURIER BLOCK**



**PATHWAY NEAR COONUT GROOVE**

**ARUL ILLAM BLOCK**





## 6.2. Biodiversity in the campus

Any natural or planted vegetation occupying the whole of or a part of a landscape is defined as its green cover. The rapid and unchecked urbanization has turned the naturally forested land cover into mere concrete jungles giving rise to the “urban island effect”. To tackle this there is a need to build green and open spaces in urban areas as trees

As per the Urban and Regional Development Plan Formulation Implementation (URDPFI) guidelines, there should be 10-12 sqm of per-capita green space in urban area and 1.2 to 1.4 Ha of green space per 1,000 population.

Green cover assessments can be effectively carried out with the help of GIS based softwares such as QGIS, Arc GIS or Google Earth. These are remote sensing softwares which can be used to gather spatial data.

Here QGIS is used to collect spatial data to calculate the total area of college as well as the corresponding green cover.



### Green cover of the campus

Total area=96,744.00sqm

Total green cover area=Green Area1+Green Area2 +Green Area 3

75.789.63=63,957.39+6,318.94+5,513.30

Percent green cover=  $\frac{\text{Totalgreencoverarea} \times 100}{\text{Total area}}$

$$= \frac{75.789.63 \times 100}{96,744.00}$$

$$= 78.34\%$$



### 6.3. Establishment of lawns, trees, herbs, shrubs in the Campus

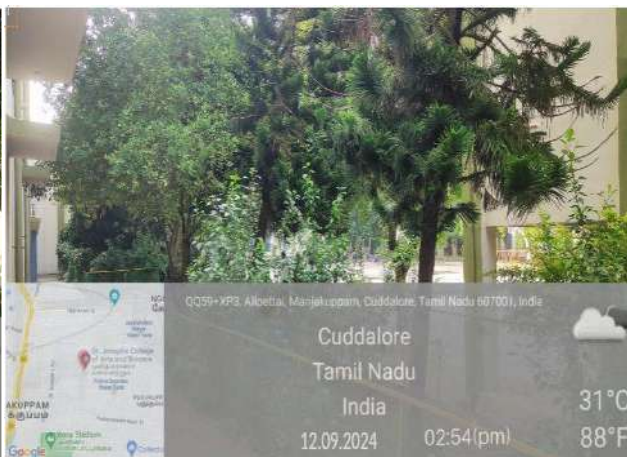
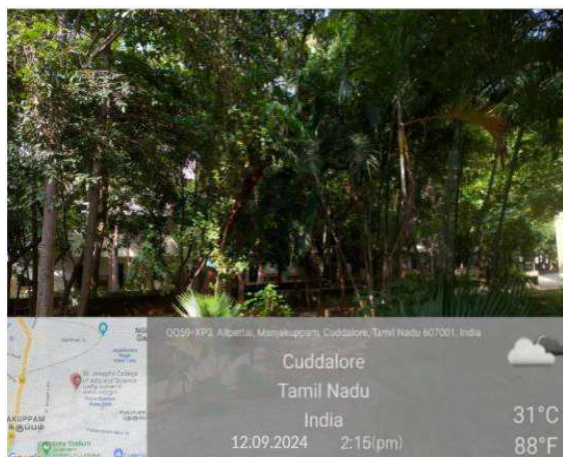
The advantage of garden is that it prevents the unintended weeds growth in the unutilized landscape areas. Trees that are native to land with medicinal value, ethnicity and environmental value add an advantage to green building. Purpose of trees is to provide shade, atmospheric CO<sub>2</sub> sequestration and supply of oxygen that serves the purpose of a green campus. Herbs are small plants with medicinal values and shrubs are small plants with thick stems and can hold soil to some extent than the herbs and serve the purpose of soil erosion. Climbers can grow with the support of wall structures and the climbers can enhance the wall value with greeneries.

The College campus has sufficient number of plants, shrubs and lawns. It is further observed that all the plants are growing profusely and showing healthier free from pests and diseases attack.

(For plants that were recorded during audit is listed in the APPENDIX)

#### TARBUS BLOCK

#### VENMANI BLOCK



#### LIBRARY BLOCK

#### ARUL ILLAM BLOCK



### Greeneries in the campus

Lawns are gazing features of unutilized land made to cover the soil with green grass for the ambience of the place to have a greenish look. Lawn provides a hollow space among the building structures. The shaded trees in between the grass lawn, pathways and garden benches are meaningful lineaments to the green campus. The advantage of lawn is that it prevents the unintended weeds growth in the unutilized landscape areas. Trees that are native to land with medicinal value, ethnicity and environmental value add an advantage to green building. Purpose of trees is to provide shade, atmospheric CO<sub>2</sub> sequestration and supply of oxygen that serves the purpose of a green campus. Herbs are small plants with medicinal values and shrubs are small plants with thick stems and can hold soil to some extent than the herbs and serve the purpose of soil erosion. Climbers can grow with the support of wall structures and the climbers can enhance the wall value with greeneries.

### **7. Landscape design and Soil erosion control**

Landscape management is the care of land to make sure that landscapes can fulfil the needs and aspirations in an effective and sustainable manner for current and future stakeholders. It is an action that forms a perspective of sustainable development, to ensure the preservation of a panorama, in order to help and harmonize changes which are added through social, monetary and environmental methods. Landscape design is an important feature for any disasters to control especially with respect to the soil erosion. The observation revealed that the college campus has planned landscape design, the pots and garden is mulched with vermicompost increasing water holding capacity.



**Greeneries in the Library Block**

## 8. Use of organic and green manures

Natural or eco-friendly methods should be used to grow plants vigorously in the campus which could reduce the environmental pollution. Use of bio-fertilizers, organic manures (cow dung, vermicompost and plant wastes and litters) keeps the campus organic. The plant waste such as fallen leaves, stems, fruits, nuts, seeds and other plant parts should be used to make green manures. Vermicomposting is a method of preparing enriched compost with the use of Earthworms.

It is one of the easiest methods to recycle agricultural wastes and to produce quality compost. Earthworms consume biomass and excrete it indigested Form called worm casts. Worm casts are popularly called as Black gold. The casts are rich in nutrients, growth promoting substances, beneficial soil micro flora and having properties of inhibiting pathogenic microbes. Vermicompost is stable, fine granular organic manure, which enriches soil quality by improving its physicochemical and biological properties. Vermicompost is becoming popular as a major Component of organic farming system. Vermicomposting materials. The institution uses Pit method. Composting is done in the Cemented pits.



**Fine granular organic manure-Vermicompost rich in nutrients**



## Fine granular organic manure-Vermicompost rich in nutrients



**Pit method of Composting done in the Cemented pits**



## 9. Aquaculture

As the demand for seafood has increased, technology has made it possible to grow food in coastal marine waters and the open ocean. Aquaculture is a method used to produce food and other commercial products, restore habitat and replenish wild stocks, and rebuild populations of threatened and endangered species.

Audit survey shows the institution is committed to supporting an aquaculture industry that is economically, environmentally and socially sustainable. As the institution is in the belt of coastal area supporting aqua culture, this initiative lays foundation for future entrepreneurs in sustainable culture.



**Aquaculture Tank**

Aquaculture is an environmentally responsible source of food and commercial products, helps to create healthier habitats, and is used to rebuild stocks of fishes. Gambusia Fish called Mosquito Fish are important to the Mosquito Control Program. They eat mosquito larvae as soon as they hatch from the eggs laid by mosquitoes, thus reducing mosquito population. Due to their unique head shape mosquito fish can push their mouth to the absolute edge of the water's surface where oxygen is just being dissolved. This allows them to live in bodies of water with extraordinarily low oxygen levels, as low as 0.2 mg/L. The institution has initiated the use of Gambusia to control mosquito menace. The institution also promotes the culture of *Labeo rohita* for economic sustainability.



**Aquaculture of *Labeo rohita***



**Gambusia Fish Tank**

## 10. Importance of Biodiversity Conservation

The campus should be a mini biodiversity conservation area, wherein, more greenery due to native plant species, medicinal plant garden, concept gardens, flowering plants that attract bees, birds, beetles and other animals like squirrels should be monitored as ecosystems. Shade giving trees in the paths, flowering trees in the avenues and fruit trees at the back yards also would attract birds, bees, butterflies and squirrels. Maintaining small ponds/open water sources and reservoirs will attract these small harmless animals to the campus.

The most prominent environmental services are fresh water, sunlight and plant products.

**The details of harvest from fruits and vegetable plants are listed below.**

01.	Plantain bunches	16nos.
02.	Radish	12Kg
03.	Tomato	14Kg
04.	Brinjal	22Kg
05.	Coconut	1435nos.
06.	Gooseberry	30Kg.
07.	FigFruit	10Kg.
08.	Papaya	22Kg.
09.	Mango	21Kg.
10.	Jamun	04Kg.
11.	Indian Almond	03Kg.



## 11. Conduct of outreach programmes for dissemination of Green campus motto and green pledge initiatives

Awareness programme on the green campus initiatives needs to be accounted in a sustainable manner. Its benefits and self-sustainability can be projected for wider centric on earth and ecology conservation. Innovative practices that add up credentials in implementing the green campus which needs to be promoted in the awareness programme to the students and staff members including public domain. Technology driven solutions initiated by the green campus organization can also be disseminated and documented successively for propagating the attitude of the green campus in wider masses. The Management has taken sufficient attempts to disseminate the green campus motto and green pledge such as ‘don’t cut trees’, ‘don’t use plastic bags’, ‘don’t waste waters’, ‘Plastic free zones ’and ‘Preserve the natural resources’ etc. among the students and staff members in the campus.

The campus has organized various Tree Plantation programmes in the college premises and surrounding villages through NSS unit, Enviroclub , RRC, YRC, Rotract and other supporting services in the college.

**The following table shows the tree plantation details of various supporting services in the college**

S. No.	Supporting Service	No. of trees planted
1.	NSS	23
2.	NCC	10
3.	Enviroclub	13
4.	YRC	14
5.	RRC	11
6.	JCI	9
TOTAL		80
No. of trees fell down		11

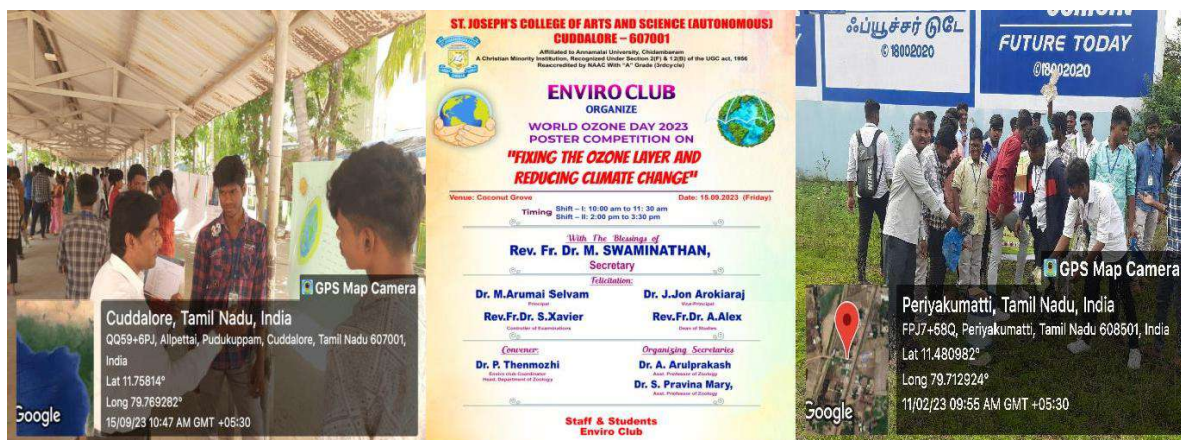


**Vermicomposting Training Programme**



**Important awareness Programs conducted in the year are listed below**

S. No.	Date	Name of the programme	Title
1.	21-07-2023	Inauguration	Inauguration of Enviroclub
2.	15-09-2023	Ozone day celebration	World ozone day celebration - 2023
3.	11-09-2023	Palm tree plantation	Palm tree plantation -Campaign
3.	06-10-2023	Vermicomposting training	Vermicomposting training programme
4.	28-07-2023	Cleanliness awareness	Cleanliness awareness programme



**Ozone day celebration and cleaning campaign**





### **Sparrow and turtle conservation awareness programme**

#### **12. Academic credentials: Projects, Dissertations and Thesis work**

Project, Dissertation and Thesis works are academic effort credentials that always foster the innovative ideas on thinking and implementation of new innovative approaches. Applied research work of the faculties, staff and student members should be implemented within the campus owing to the credential of the research. Those works indicating the significance of empowering the green campus can be implemented or adopted in other organizations. If the innovation is capable of developing into entrepreneurship, then it is highly appreciable. The Report of projects and dissertations which are productive in methodologies should be disseminated through presentation and publication in social media, books, magazines and journals so as to spread the innovative ideas and methods to the broad public. As an effort to preserve terrestrial land in the Cuddalore District, the Enviro Club of St. Joseph's College (Autonomous), Cuddalore, inaugurated a small vermicomposting unit with species of *Eudrilus eugeniae* near the department of Zoology on 06.10.2023. The main objective of the training is to awaken the students about the value of organic manure and agriculture.

Department of Zoology, enumerated the value of vermicomposting, organic farming, and strategies for protecting the land resources and risks associated with environmental degradation. They are emphasizing the value of organic manure and vermicomposting in the development of organic farming.





### Vermicomposting Training programme

#### 13. Best practices followed in the Organization

1. St, Joseph's college of Arts and science Green Campus has **exemplary performance**. Google earth imagery shows green cover more than 78% which includes 20% planted vegetation, farming, 7% forest vegetation and remaining natural vegetation that's preserved can have tremendous benefits, both tangible and intangible. The most tangible benefits are the reduction in energy consumption as the benefits of green campus include reduction in urban heat island effect, improved health & well-being of the occupants, enhancing air quality & promoting biodiversity, safety benefits, conservation of scarce national resources and zero waste to land fill.
2. The institution has good infrastructure, the classrooms are clean and well ventilated.
3. Know green and think green is promoted in the campus by giving lectures, poster presentations and seminars.
4. Landscaping and green cover in the campus is maintained properly by gardener and sufficient number of workers.
5. All types of trees have a name board.
6. Restricted entry of vehicles is adopted to improve green system of the campus.
7. The college was awarded with "Green Champion Award 2023" with a certificate and cash award of Rs.1,00,000 by District Administration in Tamil Nadu on 06.06.2023.

8. The institution has started Aquaculture as a part of skill development sowing the seeds of entrepreneur to the budding students.
9. The institution has high quality vermicompost that is sold to staff for their house garden at very low cost.
10. As an initiative in the conservation of natural water bodies in Cuddalore District, the Enviro Club of the College has conducted Palm tree plantation **Campaigns for the past 5 years** around Perumal lake of Kullanchavadi and **Gadilum River bank of Thirumanikuzhi**. The main objective of the campaign is awakening the students with good knowledge of significance of protecting the water resources such as lakes, river etc. from land encroachments and any further 'deterioration' and thereby protecting the environment.

#### **14. Recommendations**

1. Simple reuse of grey water after root zone treatment could be used for non-potable uses such as irrigation or fish culture in ponds can be thought about.
2. Bamboo shrubs can be increased in Number. It conserving soil and water, improving the quality of the land on which it grows, and sequestering carbon dioxide.
3. As there is abundant and good quality groundwater there can be more number of sprinklers spread in garden to cool the ambience atmospheric temperature.
4. In certain areas landscaping can be planned with natural pond with butterfly attracting plants such as Marigold, Wild sage, Cocks comb, etc.

#### **15. Conclusion**

St. Joseph's College Under the leadership of Secretary of the College Rev. Fr. Dr. M. Swaminathan, team of committed staff and students the college is marching towards excellence and sustainable development. St. Josephs College has a strong environmental policy and practices in place to provide a clean, green and well-ventilated space for academic endeavours. The Management has taken a substantial amount of environmental awareness initiatives to provide the green campus to the stakeholder's. and has shown exemplary performance in preserving the green cover and bio diversity. The installations of rainwater harvesting system to conserve rain water are noteworthy in the campus. The management has maintained more than 78% of the green cover are a providing healthy environment to the stakeholders is appreciable one. The natural topography and very good landscape design without disturbing the natural vegetation are being maintained.

Department of zoology has put in efforts such as vermicomposting and aquaculture is highly appreciable .this initiative could be road map to students to think of entrepreneurship in sustainable manner.



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## APPENDIX

(Vegetations documented during green audit at St. Joseph's College of Arts & Science Autonomous, Cuddalore, Tamil Nadu)

<ol style="list-style-type: none"><li>1. Coconot (<i>Cocos nucifera</i>)</li><li>2. Mango (<i>Mangifera indica</i>)</li></ol>	 Four photographs showing coconut and mango trees in a campus setting. The top-left photo shows a row of coconut trees with a building in the background. The top-right photo shows a row of mango trees. The bottom-left photo shows a row of coconut trees with blue awnings. The bottom-right photo shows a row of mango trees.
<ol style="list-style-type: none"><li>3. Banana (<i>Musa indica</i>)</li><li>4. IndianAlmond (<i>Terminalia catappa</i>)</li></ol>	 A photograph of a banana tree and an Indian almond tree. The banana tree is in the foreground, and the Indian almond tree is behind it. A building is visible in the background.

5. Indian Gooseberry  
(*Phyllanthus emblica*)



6. Spiderplant  
(*Chlorophytum comosum*)

7. Areca Palm  
(*Areca catechu* L.)



8. Flame of the woods  
(*Ixora coccinea*)

9. Neem  
(*Azadirachta indica*)





10. Doubpalm  
(*Borassus flabellifer*)

11. Periwinkle  
(*Catharanthus roseus*)

12. Miniature Allamanda  
(*Allamanda chottii*)



13. Moses in the cradle  
(*Tradescantia spathacea*)

14. Oleander  
(*Nerium oleander*)



15. White Champa  
(*Plumeria alba*)





16. Yellowbells  
(*Tecomastans*)



17. Northernwhite-cedar  
(*Thuja occidentalis*)



18. Papaya  
(*Carica papaya*)











**Glimpses of Green Cover in the Campus**



**Biodiversity present at St. Joseph's College of Arts & Science Autonomous,  
Cuddalore, Tamil Nadu**







## GREEN CHAMPION AWARD



GREEN CHAMPION AWARD GIVEN BY TAMILNADU GOVERNMENT











முள்ளிகிராம்பட்டு கிராமத்தில்  
**கருவேல மரங்கள்  
 அகற்றும் பணி**  
 நெல்லிக்குப்பம், ஆக.22-  
 கடலூர் புனித வளனார்  
 கலை கல்லூரியின் கிராம  
 சேவை பயிற்சி திட்டத்தின்  
 கீழ் நெல்லிக்குப்பம் அருகே  
 உள்ள முள்ளிகிராம்பட்டு  
 கிராமத்தில் கருவேல மரங்கள்  
 அகற்றும் பணி நடைபெற்றது.  
 இதில் வரலாற்று துறையை  
 சேர்ந்த மாணவர்கள் கலந்து  
 கொண்டு, கருவேல மரங்களை  
 வெட்டி அகற்றினர்.  
 இது குறித்து மாணவர்கள்  
 கூறுகையில், முதற்கட்டமாக  
 கருவேல மரங்களை வெட்டி  
 அகற்றி உள்ளோம். அதனை  
 தொடர்ந்து அந்த கிராமத்தில்  
 உள்ள ஏரி, குளம், கோவில்  
 ஆகியவற்றை சுத்தம் செய்  
 வோம். தொழுநோய், காச  
 நோய், இயற்கை மருத்துவம்,  
 டெங்கு குறித்து கிராம மக்களி  
 டையே விழிப்புணர்வு ஏற்ப  
 டுத்துவோம் என்றனர்.

**Clean Campaign Programme**



**Vermicomposting Training Programme**



UDYAM-KR-02-0063611

## NIMMA BHOOMI SOLUTIONS

### CERTIFICATION

This is to certify that the Green audit was conducted onsite at  
St. Joseph's College of Arts & Science (Autonomous), Cuddalore - 607001,  
Tamil Nadu, India on 21.09.2024, Saturday.

I assure that the data collected and documented is authentic.

**Dr. Helen Roselene**

**PhD, MPhil, M.Sc., PG diploma in pollution analysis**

**CQI-IRCA Certified**

**EMS ISO 14001:2015**

**Lead Auditor**



**QMS/6567/0824**



**EMS/658D/0824**

#5, JHBHS, Gubblala Main road, Subramanyapura police station, Bengaluru - 560061  
Registered with MSME, Government of India-UDYAM-KR-02-0063611



**BUREAU VERITAS**  
Certification



## Certificate of Achievement

This is to certify that

*Helen Roselene Thomas*

has attended and successfully completed the course assessment and examination for the

***PR315: EMS ISO 14001:2015 Lead Auditor Training Course***

---

Course No. 17912 certified by the CQI and IRCA. This course satisfies the training requirements for the CQI and IRCA EMS Auditor Certification Scheme.

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Held on: **July 22 – 26, 2019**

at: **Bengaluru, India**

Signed: \_\_\_\_\_

Date: **July 10, 2020**

**Anantha Prabhu**  
General Manager, Technical, SAR,  
ICC (Global Schemes) & Global Accreditation, Training

Certificate Serial No: **19/IN/1020306/4801**

Unique Delegate No: **195371**

