



SREE NARAYANA COLLEGE, PUNALUR

AQAR 2023-24

Criteria 7.1.6.1-Green Audit

SREE NARAYANA COLLEGE PUNALUR

GREEN AUDIT REPORT 2023-2024

In an age marked by frequent environmental crises, the protection and preservation of ecosystems has become essential. Sustainable development is vital for the progress of any society. During the academic year 2023-2024, a green audit was conducted at Sree Narayana College, Punalur, to assess the institution's impact on air, water, and biodiversity.

This audit evaluated the college's biodiversity, water usage, waste management practices, and carbon footprint to pinpoint areas requiring improvement and to establish priorities for future projects. An internal audit team, comprising two faculty members and students, was formed for this purpose. We are pleased to present this green audit report to the management of Sree Narayana College.

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1. METHODOLOGY

The audit was conducted using a combination of methods, including observation, surveys, and discussions with relevant personnel. Key areas specific to the college were assessed through a structured questionnaire, response collection, physical site inspections, data and document analysis, interviews with end-users and responsible staff, as well as conducting necessary measurements and counts.

2. DATA COLLECTION

During the initial phase of data collection, comprehensive information was gathered using various methods, including observation, surveys, discussions with relevant personnel, data analysis, and measurements. The methodology involved preparing and completing questionnaires, conducting physical inspections of the campus, reviewing documents, observing processes, and interviewing responsible individuals.

3. BIODIVERSITY AUDIT

The biodiversity audit aims to provide a clear understanding of the campus's ecological characteristics and to promote the conservation of existing flora and fauna. Ecological preservation involves safeguarding biodiversity and ensuring the sustainability of the ecosystem by maintaining air quality, water resources, and effective waste management on campus. The audit involved identifying and recording the plant and animal species present. Tree name boards displaying scientific names were installed to enhance students' knowledge about various plants, inspiring them to contribute to plant conservation.

The college campus spans over an area of 25 acres which is surrounded by lush green vegetation. The institution is situated in a serene atmosphere away from the bustling town. The campus is rich in biodiversity with different types of flora and fauna as it is situated in the foothills of Western Ghats which is considered as a World Heritage Site by UNESCO. There are around 400 different species of plants which includes herbs, shrubs and trees. Herbs like *Cyanthillium cinereum* (Little iron weed), *Tridax procumbens* (Tridax daisy) and *Euphorbia heterophylla* (Wild poinsettia) are common. Shrubs include *Senna alata* (Candle bush), *Chassalia curviflora* (Curved flower woody chassalia) and *Clerodendrum infortunatum* (Hill glory bower). Economically important trees like *Tectona grandis* (Teak) are also planted and preserved in campus. Lower plants like ferns and bryophytes enriches the biodiversity. Pteridophytes like *Pteris* and *Selaginella* are common. Campus has a garden of ornamental plants including *Auracaria heterophylla* (Monkey's puzzle), *Cyrtostachys renda* (Ornamental Palm), *Bauhinia purpurea* (Purple Bauhinia), *Murraya paniculata* (Orange Jasmine) and *Cassia fistula* (Golden shower tree). Different medicinal

plants in the campus include *Azadirachta indica*, *Andrographis paniculata* (Green chiretta), *Achyranthes aspera* (pricky chaff flower). Plant wealth in the campus include food crops like *Manihot esculenta* (Tapioca), *Pisum sativum* (Pea), *Amaranthus* sps (Amaranth), *Mangifera indica* (Mango) and *Artocarpus heterophyllus* (jack fruit).

LIST OF PLANTS IN THE CAMPUS

HERBS AND CLIMBERS

Scientific Name	Common name	Family
<i>Desmostachya bipinnata</i> (L.) Stapf	Big cord grass, Darbha	Poaceae
<i>Cymbopogon nardus</i> (L.) Rendle	Lemon grass	Poaceae
<i>Pennisetum polystachium</i> (L.) Schult	Pennisetum	Poaceae
<i>Spermococe ocymoides</i> Burm.f.	Purple leaved button weed, Taravu	Rubiaceae
<i>Clitoria ternatea</i> L.	Butterfly Pea	Faboideae
<i>Coccinia grandis</i> L. Voigt	Coccinia	Cucurbitaceae
<i>Mikania micrantha</i> Kunth.	Mikenia	Asteraceae
<i>Acalypha indica</i> L.	Indian Acalypha, Kuppamani	Euphorbiaceae
<i>Acalypha ciliate</i> Forssk	Acalypha	Euphorbiaceae
<i>Achyranthes aspera</i> L.	Prickly Chaff Flower	Amaranthaceae
<i>Ageratum conyzoides</i> L.	White weed	Asteraceae
<i>Alternanthera bettzickiana</i> (Regel) G. Nicholson	Calico plant	Amaranthaceae
<i>Alysicarpus vaginalis</i> (L.) DC.	Alyce Flower	Faboideae
<i>Alternanthera brasiliana</i> (L.) Kuntze	Brasilian joyweed	Amaranthaceae

<i>Andrographis paniculata</i> (Burm.fil.) Nees	Kalmegh	Acanthaceae
<i>Bridelia stipularis</i> (L.) Blume	Bridelia	Phyllanthaceae
<i>Centrosema molie</i> Benth.	Centrosema	Faboideae
<i>Euphorbia hirta</i> L.	Asthma weed	Euphorbiaceae
<i>Chassalia curviflora</i> Wall (Thawaitea)	Chassalia	Rubiaceae
<i>Costus speciosus</i> J. (Koenig) Sm.	Costus	Costaceae
<i>Curculigo orchiodes</i> Gaertn.	Black Musli	Hypoxidaceae
<i>Cyanotis cristata</i> (L.) D. Don	Crested Fat Ears	Commelinaceae
<i>Cyclea peltata</i> Hook. F. & Thoms	Raj Patta	Menispermaceae
<i>Indigofera linnaei</i> Ali	Birdsville indigo	Fabaceae
<i>Ipomoea hederifolia</i> L.	Red morning glory	Convolvulaceae
<i>Laportea interrupta</i> (L. Chew	Laportea	Urticaceae
<i>Sida acuta</i> Burm. f.	Sida	Malvaceae
<i>Mimosa pudica</i> L.	Touch me not	Fabaceae
<i>Mimosa diplotricha</i> Sauvallae	Gaint sensitive plant	Fabaceae
<i>Mollugo pentaphylla</i> L.	African chickweed	Molunginaceae
<i>Olderlandia umbellata</i> L.	Chay root	Rubiaceae
<i>Oxalis corniculata</i> L.	Creeping Oxalis	Oxalidaceae
<i>Spilanthes acmella</i> (L.) Murrey	Spilanthes	Asteraceae
<i>Peporomia pellucida</i> (L.) Kunth	Silverbush	Piperaceae
<i>Pilea microphylla</i> (L. Liebm	Gun powder plant	Urticaceae
<i>Synedrella nodiflora</i> (L.) Gaertn.	Synedrella weed	Asteraceae
<i>Vernonia cinerea</i> L.	Ash fleabane	Asteraceae
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	Bitter ginger	Zingiberaceae

SHRUBS

Scientific Name	Common Name	Family
<i>Ixora coccinea</i> L.	Garden Flame	Rubiaceae
<i>Melastoma malabathricum</i> (L.) Smith	Melastoma	Melastomaceae
<i>Croton bonplandianus</i> Baill.	Ban Thulsi	Euphorbiaceae
<i>Clerodendrum infortunatum</i> L.	Hill glory bower	Verbenaceae
<i>Cyrtostachys renda</i> Blume.	Sealing wax palm	Aracaceae
<i>Helicteres isora</i> L.	East Indian Screw tree	Malvaceae
<i>Leea indica</i> (Burm.f.) Merr.	Bandicoot Berry	Vitaceae
<i>Melicope lunu-ankenda</i> (Gaertn.)T.G.Hartley	Melicoppe	Rutaceae
<i>Senna alata</i> (L.) Roxb.	Candle bush	Fabaceae

TREES

Scientific Name	Common Name	Family
<i>Delonix regia</i> (Boj.ex Hook.) Rafin.	Gulmohar	Caesalpiniaceae
<i>Bauhinia variegata</i> L.	Purple bauhinia	Caesalpiniaceae
<i>Mangifera indica</i> L.	Mango tree	Anacardiaceae
<i>Lagerstroemia speciosa</i> (L.) Pers	Pride of India	Lythraceae
<i>Cinnamomum tamala</i> (Buch.-Ham) Th. G. G. Nees	Indian bay leaf	Lauraceae
<i>Adenanthera pavonine</i> L.	Red Lucky seeds	Mimosaceae
<i>Syzygium cumini</i> L. Skeels var. <i>cumini</i>	Malabar Plum	Myrtaceae

<i>Tectona grandis</i> L. f.	Teak	Lamiaceae
<i>Ficus Benghalensis</i> L. var benghalensis	Indian Banyan	Moraceae
<i>Morinda citrifolia</i> L.	Noni	Rubiaceae
<i>Caryota urens</i> L.	Fishtail Wine palm	Aracaceae
<i>Cassia fistula</i> L.	Golden shower tree	Caesalpiniaceae
<i>Azadirachta indica</i> A. Juss.	Indian Lilac	Meliaceae
<i>Peltophorum pterocarpum</i> (DC.) Backer ex Heyne	Yellow flame tree	Caesalpiniaceae
<i>Psidium guajava</i> L.	Guava	Myrtaceae
<i>Plumeria alba</i> L.	Frangipani	Apocynaceae
<i>Swietenia macrophylla</i> King.	Mahagani	Meliaceae
<i>Alstonia scholaris</i> (L.)R. Br	Blackboard tree, Devils tree	Apocynaceae
<i>Auracaria heterophylla</i>	Monkey's puzzle	Araucariaceae
<i>Hevea brasiliensis</i> (Willd. Ex A. Juss.) Muell.-Arg	Rubber	Euphorbiaceae
<i>Ficus auriculata</i> Lour.	Roxburgh Fig	Moraceae
<i>Phyllanthus emblica</i> L.	Gooseberry	Euphorbiaceae
<i>Garcinia gummi-gutta</i> (L.) Robs.var gummi-gutta	Malabar tamarind	Clusiaceae
<i>Pterocarpus marsupium</i> Roxb.	Indian Kino tree	Fabaceae
<i>Macaranga peltate</i> (Roxb.) Mull. Arg.	Macaranga	Euphorbiaceae
<i>Atrocarpus heterophyllus</i> Lam	Jackfruit	Moraceae
<i>Aporosa lindleyana</i> (Wight.) Baill.	Lindley's aporosa	Euphorbiaceae
<i>Holarrhena pubescens</i> Wall. Ex G. Don	Indrajao	Apocynaceae
<i>Atrocarpus hirsutus</i> Lam.	Wild Jack	Moraceae

<i>Careya arborea</i> Roxb.	Kumbi	Lecythidaceae
<i>Pterocarpus marsupium</i> Roxb.	Indian Kino Tree	Fabaceae
<i>Terminalia paniculata</i> Roth.	Flowering Murdah,	Combretaceae
<i>Carica papaya</i> L.	Papaya	Caricaceae
<i>Cocos nucifera</i> L.	Coconut	Aracaceae
<i>Acacia nilotica</i> (L.) Delile	Gum Arabic Tree	Terminalia paniculata
<i>Erithrina variegata</i> L.	Indian Coral Tree	Fabaceae

The campus is blessed with different types of mammals, birds and fishes. The pond in the college is habitat to various aquatic species like *Anabas testudineus* (Climbing Perch) and *Poecilia reticulata* (Guppy). Birds include *Columba livia domestica* (Rock pigeon), *Streptopelia chinensis suratensis* (spotted dove) and *Cuculus micropterus* (Indian cuckoo). *Pteropus giganteus* (Great Indian Fruit Bat), *Herpestes edwardsii* (Common Mongoose) and *Funambulus palmarum* (Three striped palm squirrel) are some of the mammals.

LIST OF ANIMALS

FISHES

SCIENTIFIC NAME	COMMON NAME	FAMILY
<i>Anabas testudineus</i>	Climbing Perch	Anabantidae
<i>Poecilia reticulata</i>	Guppy	Poeciliidae

BIRDS

SCIENTIFIC NAME	COMMON NAME	FAMILY
<i>Columba livia domestica</i>	Rock Pigeon	Columbidae
<i>Streptopelia chinensis suratensis</i>	Spotted Dove	Columbidae
<i>Streptopelia risoria</i>	White Dove	Columbidae
<i>Corvus splendens</i>	Crow	Corvidae
<i>Corvus macrorhynchos culminatus</i>	Large billed crow	Corvidae
<i>Dinopium benghalenses</i>	Woodpecker	Picidae

<i>Microplernus brachyurus jerdonii</i>	Rufus Woodpecker	Picidae
<i>Dinopium javanese</i>	Common Flameback Wookpecker	Picidae
<i>Passer domesticus</i>	Sparrow	Passeridae
<i>Acidotheres tristis</i>	Myna	Sturnidae
<i>Clamator jacobinus</i>	Pied Cuckoo	Cuculidae
<i>Eudynamis scolopacea</i>	Asian Koel	Cuculidae
<i>Cuculus micropterus</i>	Indian cuckoo	Cuculidae
<i>Clanga hastata</i>	Indian Spotted Eagle	Accipitridae
<i>Haliastur indus</i>	Brahminy Kite	Accipitridae
<i>Milvus migrans govinda</i>	Black Kite	Accipitridae
<i>Glaucidium radiatum malabaricum</i>	Owlet	Strigidae
<i>Sitta frontalis frontalis</i>	Nuthatch	Sittidae
<i>Turdoides striatus malabaricus</i>	Jungle Babbler	Cisticolidae
<i>Psylloscopus trichiloides viridanus</i>	Greenish Warbler	Phylloscopidae
<i>Coracias benghalensis indica</i>	Indian Roller	Coraciidae
<i>Dicurus leucophaeus longicaudatus</i>	Grey or Ashy Drongo	Dicruridae
<i>Rubricapilla malabarica</i>	Crimson Throated barbet	Megalaimidae
<i>Collocalia unicolor</i>	Indian Edible Nest Swiftlet	Apodidae
<i>Upupa epops ceylonensis</i>	Hoopoe	Upupidae
<i>Copsychus saularis ceylonensis</i>	Oriental Magpie-robin	Muscicapidae
<i>Milvus migrans</i>	Pariah Kite	Accipitridae
<i>Proceis philippinus travencorensis</i>	Travancore Baya	Ploceidae
<i>Motacilla cineria cineria</i>	Large Pied Wagtail	Motacillidae
<i>Buceros bicornis</i>	Great Hornbill	Bucerotidae

MAMMALS

SCIENTIFIC NAME	COMMON NAME	FAMILY
<i>Pteropus giganteus</i>	Great Indian Fruit Bat	Pteropodidae
<i>Funambulus sublineatus</i>	Dusky Striped Squirrel	Sciuridae
<i>Funambulus palmarum</i>	Three Striped Palm Squirrel	Sciuridae
<i>Herpestes edwardsii</i>	Common Mongoose	Herpestidae
<i>Felis catus</i>	Domestic cat	Felidae
<i>Bandicota bengalensis</i>	Indian Mole rat	Muridae
<i>Rattus rattus</i>	Black Rat	Muridae
<i>Rattus norvegicus</i>	Brown Rat	Muridae
<i>Mus booduga</i>	Indian Field Mouse	Muridae
<i>Felis chaus</i>	Jungle Cat	Felidae
<i>Canis lupus familiaris</i>	Domestic dog	Canidae

4. WASTE MANAGEMENT AUDIT

The campus waste management system was evaluated to enhance the handling of both biodegradable and non-biodegradable waste materials. The 3R principle—Reduce, Reuse, and Recycle—is employed to ensure the effective implementation of waste management protocols on college grounds. Proper waste management is essential for maintaining an eco-friendly campus. Given the variety of waste generated in colleges, managing its collection and disposal poses significant challenges. The details below outline the types of waste produced and the strategies adopted by the college for their disposal.

The college follows the Green Protocol in all of its projects and operations. For the Protocol to be implemented effectively on the college grounds, the 3R waste management principle (Reduce, Reuse, and Recycle) is employed.

Under N.S.S. and N.C.C. outreach programs including Bharath Abhiyan campaigns, Swachatha hi Seva campaigns, Poshan Pakwada, and Swatch Pakwada, extensive solid waste collection is also done on a regular basis. Colleges and dormitories have sanitary napkin incinerators installed for the careful disposal of sanitary napkins.

Liquid Waste Management

To treat liquid waste produced on campus from the dormitory, canteen, wash area, and restrooms, the campus contains subsurface drainage systems and leach pits. The Department

of Chemistry takes great care to guarantee that any liquid waste water produced in labs does not expose users to chemical risks.

E-Waste Management

In order to efficiently reuse the electronic equipment, special attention is paid to its repair and maintenance. To ensure optimal use, all the electronic gadgets need routine maintenance. The providers themselves guarantee proper maintenance and upkeep. E-waste produced by the institute is collected from various departments and securely stored until a deal is struck with a company that recycles E-waste.

Biomedical Waste Management

On campus, no biomedical waste is produced.

5. AUDIT OF WATER USAGE

Water is an indispensable part of life and plays a critical role in sustaining both human activities and the environment. To ensure its responsible use, a water audit was carried out on the college campus. This audit aimed to provide a comprehensive understanding of the various sources of water available within the campus, their usage patterns, and potential areas for improvement. By analyzing water consumption and management practices, the college can work towards sustainable usage and conservation of this vital resource.

WATER USAGE	APPROXIMATE QUANTITY IN LITERS
Daily usage of water	11000 L
rain water harvesting	20000 L
WATER SOURCES	NUMBER
Bore well	1
Well	1
Water connection from Kerala Water Authority	1

6. CARBON FOOTPRINT

- i. Number of persons using cars: 12
- ii. Number of persons using two wheelers :197
- iii. Number of persons using other transportation: 258
- iv. Number of vehicles in the college: NIL

- v. Total number of students in the college: 1440

The majority of students on campus use public transportation, reducing the carbon foot print of the student community. Students are not allowed to drive their cars on campus, although there are parking lots set up for them outside. Staff members have parking available for their personal automobiles on campus.

7. IMPLEMENTATION OF THE RECOMMENDATIONS IN THE PREVIOUS GREEN AUDIT

- i. Environmental education should be promoted more. More training programmes, seminars and group discussion for faculties and students should be conducted to promote environmental education.
- ii. More rain water percolation pits were made to increase ground water level and conservation of rain water
- iv. Purchase policy towards eco-friendly materials was established.
- v. Students actively participated in the efforts for waste management, biodiversity conservation and water conservation.

8. BEST PRACTICES

- i. Use of solar panels to utilize solar energy.
- ii. The water usage is monitored and wasting of water is checked.
- iii. More awareness programs related to environment are conducted.
- iv. Rain water harvesting is promoted.
- v. Expansion of medicinal garden in the campus.
- vi. Biogas is promoted for cooking in canteen and hostel.
- vii. Consideration of natural lighting in the construction of new buildings.
- viii. Energy conservation awareness campaigns like Urjakiran supported by Centre for Environment and Development.
- ix. Rain water harvesting pits.
- x. Vermicompost pit to decompose biodegradable materials.
- xi. Use of biogas plant to convert biodegradable waste of the college hostel into biogas.
- xii. Biodiversity conservation efforts.
- xiii. Awareness programmes and competitions on the significance of environment and biodiversity and observation of important days like environment Day, Ozone Day and Forest Week.
- xiv. Plastic waste disposal with the help of Harithasena of Punalur Municipality.

- xv. Posters and banners made by students on waste disposal, water usage and energy conservation.
- xvi. Carpooling by faculties to control carbon emissions.

9. RECOMMENDATIONS

- i. Conduct awareness campaigns to emphasize the importance of the 3Rs: Reduce, Reuse, and Recycle.
- ii. Implement biodiversity conservation projects, such as creating butterfly gardens and establishing fruit orchards.
- iii. Enhance environmental education by organizing additional training programs, seminars, and group discussions for both faculty and students.
- iv. Strictly monitor procurement policies to ensure the purchase of eco-friendly materials.
- v. Actively engage students from all disciplines in initiatives related to waste management, biodiversity conservation, and water conservation efforts.

10. CONCLUSION

Conducting a green audit is crucial for ensuring the sustainable operation of the institution. Regular monitoring of the campus biodiversity is necessary to understand the environmental impact of its activities. Equally important are the management of waste, water usage, and carbon emissions. The recommendations outlined in this report should be thoroughly reviewed and assessed during the next audit cycle.

