

# ENVIRONMENT AUDIT REPORT

## ST. BERCHMANS COLLEGE CHANGANASSERY

2023



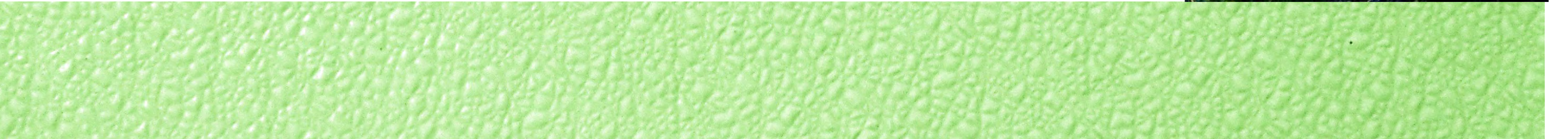
**OTTOTRACTIONS**  
Energy-Engineering-Environment

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**OTTOTRACTIONS**  
Energy-Engineering-Environment



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# ENVIRONMENT AUDIT REPORT

## ST. BERCHMANS COLLEGE

CHANGANASSERY





Environment Audit Report

## ST. BERCHMANS COLLEGE, CHANGANASSERY

Report No: EA 988  
2023

### Environment Audit Team

Ottotractions

1	Er. Suresh Babu B V,	Accredited Energy Auditor, AEA 33
2	Er. B. Zachariah	Director, Ottotractions
3	Er. Abin Baby,	Project Engineer, Ottotractions
4	Er. Devan J	Project Engineer, Ottotractions

### About OTTOTRACTIONS

**OTTOTRACTIONS** established in 2005, is an organization with proven track record and knowledge in the field of energy, engineering, and environmental services. They are the first Accredited Energy Auditor from Kerala for conducting Mandatory Energy Audits in Designated Consumers as per Energy Conservation Act-2001. Government of Kerala recognized and appreciated **OTTOTRACTIONS** by presenting its prestigious “**The Kerala State Energy Conservation Award 2009**” for the best performance as an Energy Auditor.

## **Acknowledgment**

We were privileged to work together with the administration and staff of St. Berchmans College Changanassery. for their timely help extended to complete the audit and bringing out this report.

With gratitude, we acknowledge the diligent effort and commitments of all those who have helped to bring out this report.

We also take this opportunity to thank the bona-fide efforts of team OTTOTRACTIONS for unstinted support in carrying out this audit.

We thank our consultants, engineers and backup staff for their dedication to bring this report.

Thank you.

B V Suresh Babu  
Accredited Energy Auditor  
AEA 33, Bureau of Energy Efficiency

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# INTRODUCTION

Ottotractions was asked by the **St. Berchmans College, Changanassery** to carry out an environmental audit of their campus building.

Each section contains recommendations for improvements relating to environmental issues, which are consolidated in the action plan in section 4.

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# BACKGROUND

**St Berchmans College** is the first higher education institution of the Archdiocese of Changanacherry. This institution was founded in 1922 by Venerable Mar Thomas Kurialacherry, Bishop of Changanassery diocese. It was started, with the noble aim of the Universal Catholic Church, to mould young men and women who will strive for excellence in every walks of life and human service. The College is recognized under sections 2 (f) and 12 (B) of the UGC Act 1956. The College was first accredited with 'Five Star' in 1999 and reaccredited with 'A+' in 2006. In the third cycle of accreditation in 2012, the college was again graded at A. In 2017, the college was again reaccredited with 'A' grade. The University Grants Commission (UGC) and the Government of Kerala granted autonomy to this college in the year 2014. In 1996 and 1997, it won the coveted "R Shankar Award" for the Best College in the State, instituted by the Government of Kerala. In 2004, the UGC identified the College under its "College with Potential for Excellence" scheme. The National Commission for Minority

Educational Institution, New Delhi has granted minority status to the college in 2010. All the Science Departments are supported by the FIST of DST, Government of India. It has been ranked among the top 100 Indian colleges by the National Institutional Ranking Framework (NIRF), MHRD, Government of India since 2018.

<b>Occupancy Details</b>	
<b>Particulars</b>	<b>2021-22</b>
<b>Total Students</b>	<b>2994</b>
<b>Staffs</b>	<b>165</b>
<b>Total Occupancy of the college</b>	<b>3159</b>

Total student strength of the campus is 3169. For calculating per capita carbon emission estimation, the student strength is taken into account.



# ENVIRONMENTAL ISSUES

This section is broken down into the following different areas: waste, water, energy, resource and materials use and procurement. A final 'other' section is also included for any additional issues.

## 1.1. Waste

The way communities generate and manage their waste plays an absolutely key role in their ability to use resources efficiently. All buildings contain bins for both general waste and mixed recyclables (plastic bottles, card, cans and paper). On average each floor in the buildings areas has its own general waste bin and one recycling bin. When

the bins are emptied by the cleaning staff. Bins are marked and kept in different colors for identification, however in some locations throughout the building it was unclear which bins were for which waste streams.

There are four basic ways in which campus can do **plastic** recycling **collection** services for **plastic** bottles and containers – curbside, drop-off, buy-back or deposit/refund programs. The first, and most widely accessible, **collection** method is curbside **collection** of recyclables. The campus is installed bins to collect plastic bottles and single use plastics. College has given a proper awareness on plastic waste problems and they are discouraging the students or teachers to carry plastics to the campus. The ECO club is very active in the campus and do a variety of programs to build awareness on waste management. The reports on different activities of the club is attached as technical supplement of this report.

The major concern of waste management will be focused on the solid waste produced by the campus. Solid wastes produced in the campus are mainly of three types, food waste, paper waste, and plastic waste. Food wastes produced in the campus are mainly by two means. The vegetable wastes produced in the kitchen during the food preparation. The food waste produced by the students and staffs of the campus after the consumption of meals.

<b>Degradable Waste Generation</b>	
<b>St Berchmans College (Autonomous)</b>	
Particulars	2021-22
Total Occupancy	3159
Waste generated in kg /day	63.18
Waste generated in kg /Yr	13899.6

Burning plastics shall be strictly restricted inside the campus. **Burning plastic** and other wastes releases dangerous substances such as heavy metals, Persistent Organic Pollutants, and other toxics into the air and ash waste residues. ... Such pollutants contribute to the development of asthma, cancer, endocrine disruption, and the global burden of disease.

<b>Solid non degradable Waste Generation</b>	
<b>St Berchmans College (Autonomous)</b>	
Particulars	2021-22
Total Occupancy	3159
Waste paper generated in kg /day	0.6318
Waste plastic generated in kg /day	0.9477
Waste paper generated in kg /Yr	139.00
Waste plastic generated in kg /Yr	208.49

### WASTE MINIMIZATION AND RECYCLING

1	Does your institute generate any waste?	Yes, Solid waste Canteen waste, paper, plastic, Waste etc
	If so, what are they?	
2	What is the approximate amount of waste generated per day? (in Kilograms) (approx.)	64
3	How is the waste generated in the institute managed? By	Reuse of one side printed Paper for internal communication. Sewage water is discharged to public Sewer. Kitchen waste is used to generate manures. Two types of Waste bins are provided at campus for biodegradable and non-biodegradable waste.
	1 Composting	In-house
	2 Recycling	In-house
	3 Reusing	In-house
	4 Others	
	(specify)	
4	Do you use recycled paper in institute?	Yes
5	Do you use reused paper in institute?	Yes
6	How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, Please specify.	Awareness programs, Through ECO Club, Exhibition, NSS
7	Can you achieve zero garbage in your institute? If yes, how?	Yes

### Green Cover Audit

1	Is there a garden in your institute?	Yes, Botanical garden	
2	Do students spend time in the garden?	Yes	
3	Total number of Plants in Campus	Plant type	Approx. number
		Trees	171
		Botanical Garden	Not Estimated
4	Number of Tree Plantation Drives organized by School per annum. (If Any)	Yes, Through ECO club	
5	Number of Trees Planted in Last FY.	30	
	Survival Rate	80%	

All the activities including energy consumption and waste management have their equivalent carbon emission and they positively contribute to the carbon footprint of the campus. Carbon sequestration is the reverse process, at which the emitted carbon dioxide will get sequestered according to the type of carbon sequestration employed. Even though there are many natural sequestration processes are involved in a campus, the major type of sequestration among them is the carbon sequestration by trees.

Trees sequester carbon dioxide through the biochemical process of photosynthesis and it is stored as carbon in their trunk, branches, leaves and roots. The amount of carbon sequestered by a tree can be calculated by different methods. In this study, the volumetric approach was taken into account, thus the details including CBH (Circumference at Breast Height), height, average age, and total number of the trees, are required. Details of the trees in the campus compound are given in the Table. Detailed table is included in the technical supplement.

<b>Carbon Sequestration</b>	
Particulars	2022-23
Total number of trees	172
Carbon sequestered by trees in the campus (tCO <sub>2</sub> e)	4.31

Carbon sequestered by a tree can be found out by using different methods. Since this study is employed the volumetric approach, the calculation consists of five processes.

- Determining the total weight of the tree
- Determining the dry weight of the tree
- Determining the weight of carbon in the tree
- Determining the weight of CO<sub>2</sub> sequestered in the tree
- Determining the weight of CO<sub>2</sub> sequestered in the tree per year

Carbon sequestered by each species of trees in the campus compound is given in the Table. Detailed calculation results are listed out in the tables provided in the technical supplements of 'Carbon sequestration'.

### 3.1.1 ENERGY

#### a. Electricity

The total emission of the carbon dioxide per student is **73.14** kg per year (2022). Emission reduction plans were prepared to bring the existing per capita carbon footprint to zero or below so as to bring the campus a carbon neutral or carbon negative campus. This can be achieved in many ways but, every alternate plan must be in such a way that, it must fulfill the actual purpose of each activity that is considered.

Here, three major methods are taken in to account as the plans for reducing the carbon emission of the campus.

- Resource optimization
- Energy efficiency
- Renewable energy
- Electricity Consumption

<b>Base Line Energy Data</b>		
<b>St Berchmans College (Autonomous)</b>		
		2021-22
1	Electricity KSEB (kWh)	321980
2	Electricity Solar - Off grid (kWh)	0.00
3	Electricity (KSEB + Off grid) kWh	321980
4	Electricity Grid Tied (kWh)	63875
5	Diesel (L)	595
6	LPG (kg)	600.00
7	Biogas (m3)	0.00

<b>Occupancy Details</b>	
Particulars	2021-22
Total Students	2994
Staffs	165
Total Occupancy of the college	3159

## RESOURCE OPTIMISATION

The effective use of resources can limit its unnecessary wastage. Optimal usage of the resources (such as fuels) can save the fuel and can also reduce the carbon emission due to its consumption. This technique can be effectively implemented in the 'transportation' and 'waste' sectors of the campus.

## WASTE MINIMISATION

Optimal utilization of paper and plastic stationaries can reduce the frequency of purchase of items. This can reduce the unnecessary wastage of money as well as the excess production of waste. In the case of food, proper food habits and housekeeping practices can optimize its usage.

Currently, they taking an appreciable effort to reduce the unnecessary production of wastes. But the campus still has opportunities to reduce the generation of waste and can improve much more. Resource optimization can be effectively implemented in all type of waste generated in the campus and the campus can expect about 50% reduction the total waste produced.

## ENERGY EFFICIENCY

Energy efficiency is the practice of reducing the energy requirements while achieving the required energy output. Energy efficiency can be effectively implemented in all the sectors of the campus.

## FUELS FOR COOKING

The campus can install a solar water heater to rise the water temperature to a much higher level, then it has to consume only very less amount of thermal energy for preparing the same amount of food. This can make a positive benefit to the campus by saving money, energy and can reduce the carbon emission of the campus due to thermal energy consumed for cooking.

## TRANSPORTATION

Energy efficiency of the transportation sector is mainly depended on the fuel efficiency of the vehicles used. Here mileage of the vehicle (kmpl - Kilometres per Litre) is calculated to assess the fuel efficiency of the vehicle. Percentage of closeness is the ratio of actual mileage of the vehicle to its expected mileage. If the percentage of closeness of mileages of each vehicle is greater than that of its average, then the efficiency status of the vehicle is considered as 'Above average' and else, it is considered as 'Below average'

## Renewable Energy

After analyzing the historical and measured data the following projects are proposed to make the campus carbon neutral. The projects are from energy efficiency and renewable energy. The further additions in the green cover increase will also give positive impact in the carbon mitigation.



Executive Summary					
Consolidated Cost Benefit Analysis of Energy Efficiency Improvement Projects					
St Berchmans College (Autonomous)					
Sl No	Projects	Investment	Cost saving	SPB	Energy saved
		(Lakhs Rs)	(Rs)/Yr	Months	kWh/Yr
1	Energy Saving in Lighting by replacing existing 800 No's T8 (40W) Lamps to 18W LED Tube	2.40	1.369	21.04	16896
2	Energy Saving by replacing existing 300 No's in-efficient ceiling fans with Energy Efficient Five star fans	9.00	0.914	118.10	11290
3	Installation of 220kWp Solar Power Plant	121.00	37.38	38.84	281050
	<b>Total</b>	<b>11.40</b>	<b>2.28</b>	<b>139.15</b>	<b>28185.60</b>
(The saving are projected as per the assumed operation time observed based in the discussions with the plant officials. The data of saving percentages are taken from BEE guide books and field measurements.)					

### Water Conservation Activities

List four uses of water in your institute	Basic use of water in campus:
	1. Drinking – Ground Water
	2. Gardening – Rain water
	3. Kitchen and Toilets –Ground water
How does your institute store water? Are there any water saving techniques followed in your institute?	4. Others – Lab
	Overhead Water Tanks and Sumps installed for storage of water.
If there is water wastage, specify why and How can the wastage be prevented / stopped?	Rain Water Harvesting system in place
	No

Record water use from the institute water meter for six months (record at the same time of each day). At the end of the period, compile a table to show how many liters of water have been used.	No logbooks are available
Does your institute harvest rain water?	Yes
Is there any water recycling system?	No



50kWp Solar power plant

<b>General Environmental Awareness Questioner</b>	
Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
Does your institute have any rules to protect the environment? List possible rules you could include.	Yes
Dose Environmental Ambient Air Quality Monitoring conducted by the Institute?	Yes
Dose Environmental Water and Wastewater Quality monitoring conducted by the Institute?	Yes
Dose stack monitoring of DG sets conducted by the Institute?	Yes

Is any warning notice, letter issued by state government bodies?	No
Dose any Hazardous waste generated by the Institute? If yes explain its category and disposal method	No
Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
Does your institute have any rules to protect the environment? List possible rules you could include.	Yes
Does housekeeping schedule in your campus?	Yes
Are students and faculties aware of environmental cleanliness ways? If Yes Explain	Yes
Dose Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes
Dose Institute participated in National and Local Environmental Protection Movement?	Yes
Dose Institute has any Recognition/certification for environment friendliness?	Yes
Dose Institute using renewable energy?	Yes
Dose Institution conducts a green/environmental audit of its campus?	Yes
Has the institution been audited / accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?	Yes, NAAC

<b>Best Practices and Initiatives</b>	
Renewable Energy	Yes
Solar Power Plant	
Energy Audit and Green Audit Conducted	
Biogas Plant installed	
Biodiversity Conservation	Yes
Green Cover	
Tree Plantation Drives	Yes
ECO clubs	
Ground Water Recharge	Yes
Rain Water Harvesting System.	
Pollution Reduction Public Transportation	Yes
E Waste Management	Yes
Connected to authorized recycler	
Solid Waste Management	Yes
Lifting of garbage from campus on alternate day by Municipal Corporation.	
Adoption of Village	Yes
CSR	
Water Conservation	Yes
Energy Conservation	Yes

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# RECOMMENDATIONS

1. Implement a utility monitoring program.
  - Allocate staff to carry out meter readings for electricity, waste and water on regular basis
  - Add monitoring data to spreadsheet so results can be viewed graphically
  - Compare with the utility bills meter readings in order to ensure accuracy;
2. Consider adopting and implementing a sustainable procurement policy which takes into account the whole life cycle of a product, and make sure environmental issues are written into tenders when contracting out.
3. Consider trialing recycled paper again – many recycled brands today, such as Evolve, are just as good as virgin paper.
4. Trial the use of re-manufactured (i.e. refilled) ink and toner cartridges rather

than purchasing new ones.

5. Consider producing some designated 'environmental' pages on the intranet to make it easier for staff to find environmental information. If possible a discussion forum could be set up to allow easy internal communications and staff to make suggestions for environmental improvements.
6. Environmental training could be formalized and carried out for all staff. It does not have to be too long or onerous, providing it covers key points, particularly in relation to waste so all staff are aware of the legal requirements. At the very least, environmental information should be included in the induction pack.
7. It is strongly recommended that environmental information is also given to students and staff during induction. It is particularly important for them to be aware of what waste they can dispose on site and where they can dispose of it, and what waste streams they must take away with them.
8. Consider implementing an environmental management system to incorporate all improvements and monitoring requirements. It does not need to be a complex system certified to any particular standard, merely a way of ensuring that baselines are set and progress is measured. Formation of Environment Policy and communicated to all faculties and other staff.
9. Plan for Zero Waste Campus Project
10. E-waste monthly inventory be maintained at campus as per E waste rules 2016.
11. Water Meter should be installed at institute for monitoring of water consumption per capita.
12. Increase in Environmental promotional activities for spreading awareness at campus.
13. Environment/Green committee formation for regulating eco-friendly initiatives at campus premises and periphery.



# CONCLUSION

This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. The audit has identified several observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for the team to initiate actions.

However, there is scope for further improvement, particularly in relation to waste minimization and energy monitoring. By implementing a basic environmental management system, current good practice can be formalized and a framework can be set up for monitoring, implementation of action plans and continual improvement.

The audit team observed that the overall site is maintained well from environmental perspective. There is no major observations but few things are important to initiate urgently are repairing of existing solar power plant and biogas plant, rainwater harvesting recharge; water balance cycle and periodic inspection of buildings; environment policy and initiation of composting at campus.

## References

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle Rules:1989 (Amended in 2005)
- Energy Conservation Act 2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Water [Prevention & Control Of Pollution] Cess Act-1977 (Amended 2003) and Rules- 1978
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices

# TECHNICAL SUPPLEMENTS

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**DEPARTMENT OF BOTANY**  
**ST BERCHMANS COLLEGE CHANGANACHERRY**

**LIST OF PLANTS**

Sl No.	Species Name	Family
1.	<i>Acacia mangium</i> Willd.	Mimosaceae
2.	<i>Acalypha hispida</i> Burm.f.	Euphorbiaceae
3.	<i>Adenantha pavonina</i> L.	Mimosaceae
4.	<i>Adenocalymna alliaceum</i> Miers.	Bignoniaceae
5.	<i>Agave americana</i> L.	agavaceae
6.	<i>Alangium salvifolium</i> (L.f.) Wang.	<i>Alangiaceae</i>
7.	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae
8.	<i>Alstonia venenata</i> R. Br.	Apocynaceae
9.	<i>Anamirta cocculus</i> (L.) Wight & Arn.	Menispermaceae
10.	<i>Antidesma ghaesembilla</i> Gaertn.	Euphorbiaceae
11.	<i>Ardisia littoralis</i> Andr.	Myrsinaceae
12.	<i>Artabotrys hexapetalus</i> (L. f.) Bhandari	Annonaceae
13.	<i>Artocarpus hirsutus</i> Lam.	Moraceae
14.	<i>Asparagus racemosus</i> Willd.	Asparagaceae
15.	<i>Averrhoa bilimbi</i> L.	Averrhoaceae
16.	<i>Azadirachta indica</i> A.Juss.	Meliaceae
17.	<i>Bambusa multiplex</i>	Poaceae
18.	<i>Bambusa vulgaris</i>	Bambusaceae
19.	<i>Bauhinia acuminata</i> L.	Caesalpiniaceae
20.	<i>Bauhinia tomentosa</i> L.	Caesalpiniaceae
21.	<i>Berrya cordifolia</i> (Willd.) Burret	Tiliaceae
22.	<i>Bixa orellana</i> L.	Bixaceae
23.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae
24.	<i>Caesalpinia sappan</i> L.	Caesalpiniaceae
25.	<i>Caladium bicolor</i> (Ait. ex Dryand.) Vent.	Araceae
26.	<i>Calamus rotang</i> L.	Areacaceae
27.	<i>Calliandra haematocephala</i> Hassk.	Mimosaceae
28.	<i>Cananga odorata</i> (Lam.) Hook. f. & Thoms.	Annonaceae
29.	<i>Canarium strictum</i> Roxb.	Burseraceae
30.	<i>Carallia brachiata</i> (Lour.) Merr.	Rhizophoraceae
31.	<i>Careya arborea</i> Roxb.	Lecithidaceae
32.	<i>Carica papaya</i> L.	Caricaceae
33.	<i>Carmona retusa</i> (Vahl) Masamune	Boraginaceae
34.	<i>Caryota urens</i> L.	Arecaceae
35.	<i>Cassia fistula</i> L.	Caesalpiniaceae
36.	<i>Cayratia pedata</i> (Lam.) A. Juss. ex Gagnep.	Vitaceae
37.	<i>Cestrum nocturnum</i> L.	Solanaceae
38.	<i>Chassalia curviflora</i> (Wall. ex Kurz) Thw.	Rubiaceae
39.	<i>Chrysophyllum cainito</i> L.	Sapotaceae
40.	<i>Chrysophyllum cainito</i> L.	Sapotaceae

41.	<i>Citrus sp.</i>	Rutaceae
42.	<i>Clerodendrum infortunatum</i> L.	Verbenaceae
43.	<i>Clitoria ternatea</i> L.	Fabaceae
44.	<i>Coccinia grandis</i> (L.) Voight	Cucurbitaceae
45.	<i>Coffea arabica</i> L.	Rubiaceae
46.	<i>Colocasia esculenta</i> (L.) Schott	Araceae
47.	<i>Colubrina travancorica</i> Bedd.	Rhmnaceae
48.	<i>Crataeva magna</i> (Lour.) DC.	Capparidaceae
49.	<i>Crotalaria pallida</i> Dryand.	Fabaceae
50.	<i>Cyclea peltata</i> (Lam.) Hook. f. & Thoms.	Menispermaceae
51.	<i>Desmodium gangeticum</i> (L.) DC.	Fabaceae
52.	<i>Desmodium motorium</i> (Houtt.) Merr.	Fabaceae
53.	<i>Dillenia suffruticosa</i> (Griff.) Mart.	Dilleniaceae
54.	<i>Dioscorea alata</i> L.	Dioscoreaceae
55.	<i>Diospyros buxifolia</i> (Blume) Hiern	Ebenaceae
56.	<i>Diospyros discolor</i> Willd.	Emenaceae
57.	<i>Dypsis lutescens</i> (Wendl.) Beentje & Dransf.	Arecaceae
58.	<i>Elaeocarpus serratus</i> L.	Elaeocarpaceae
59.	<i>Elaeocarpus sp.</i>	Elaeocarpaceae
60.	<i>Fagraea ceilanica</i> Thunb.	Loganiaceae
61.	<i>Ficus auricularia</i>	Moraceae
62.	<i>Ficus pumila</i> L.	Moraceae
63.	<i>Ficus racemosa</i> L.	Moraceae
64.	<i>Flacourtia montana</i> Graham	Flacourtiaceae
65.	<i>Garcinia mangostana</i> L.	Clusiaceae
66.	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp.	Fabaceae
67.	<i>Grewia nervosa</i> (Lour.) Panigrahi	Tiliaceae
68.	<i>Gymnema sylvestre</i> (Retz.) R. Br.	Asclepiadaceae
69.	<i>Hamelia patens</i> Jacq.	Rubiaceae
70.	<i>Helicteres isora</i> L.	Sterculiaceae
71.	<i>Hemigraphis colorata</i> Hallier f.	Acanthaceae
72.	<i>Hydnocarpus pentandra</i> (Buch.-Ham.) Oken	Flacourtiaceae
73.	<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	Rubiaceae
74.	<i>Ichnocarpus frutescens</i> (L.) R. Br.	Apocynaceae
75.	<i>Ixora finlaysoniana</i> Wall. ex G. Don	Rubiaceae
76.	<i>Justicia adhatoda</i> L.	Acanthaceae
77.	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae
78.	<i>Kopsia fruticosa</i> (Ker-Gawl.) A. DC.	Apocynaceae
79.	<i>Leea indica</i> (Burm. f.) Merr.	Leeaceae
80.	<i>Leucaena leucocephala</i> (Lam.) de Wit	Mimosaceae
81.	<i>Litsea coriacea</i> (Heyne ex Meisner) Hook. f.	Lauraceae
82.	<i>Livistona chinensis</i> (Jacq.) R.Br. ex Mart.	Areacaceae
83.	<i>Macaranga peltata</i> (Roxb.) Muell.-Arg.	Euphorbiaceae
84.	<i>Madhuca neriifolia</i> (Moon) H. J. Lam	Sapotaceae
85.	<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae
86.	<i>Mangifera indica</i> L.	Anacardiaceae
87.	<i>Memecylon umbellatum</i> Burm.f.	Melastomaceae

88.	<i>Mesua ferrea</i> L.	Clusiaceae
89.	<i>Mimusops elengi</i> L.	Sapotaceae
90.	<i>Morinda citrifolia</i> L.	Rubiaceae
91.	<i>Moringa oleifera</i> Bedd.	Moringaceae
92.	<i>Murraya paniculata</i> (L.) Jack.	Rutaceae
93.	<i>Mussaenda frondosa</i> L.	Rubiaceae
94.	<i>Myristica fragrans</i> Houtt.	Myristicaceae
95.	<i>Myxopyrum smilacifolium</i> (Wall.) Blume	Oleaceae
96.	<i>Nerium oleander</i> L.	Apocynaceae
97.	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae
98.	<i>Ochna integerrima</i> (Lour.) Merr.	Ocnaceae
99.	<i>Ocimum gratissimum</i> L.	Lamiaceae
100.	<i>Ocimum tenuiflorum</i> L.	Lamiaceae
101.	<i>Olea dioica</i> Roxb.	Oleaceae
102.	<i>Persea americana</i> Mill.	Lauraceae
103.	<i>Phyllanthus emblica</i> L.	Euphorbiaceae
104.	<i>Pimenta dioica</i> (L.) Merr.	Myrtaceae
105.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae
106.	<i>Pongamia pinnata</i> (L.) Pierre,	Fabaceae
107.	<i>Pothos scandens</i> L.	Araceae
108.	<i>Pouteria campechiana</i> (Kunth) Baehni	Sapotaceae
109.	<i>Psilanthus travancorensis</i> (Wight & Arn.) Leroy	Rubiaceae
110.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae
111.	<i>Pterocarpus santalinus</i> L.f.	Fabaceae
112.	<i>Pterospermum rubiginosum</i> Heyne ex Wight & Arn.	Sterculiaceae
113.	<i>Quassia amara</i> L.	Simaroubaceae
114.	<i>Samanea saman</i> (Jacq.) Merr.	Mimosaceae
115.	<i>Santalum album</i> L.	Santalaceae
116.	<i>Saraca asoca</i> (Roxb.) de Wilde	Caesalpiniaceae
117.	<i>Simarouba glauca</i> DC.	Simaroubaceae
118.	<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Verbenaceae
119.	<i>Sterculia balanghas</i> L.	Sterculiaceae
120.	<i>Stereospermum colais</i> (Buch.-Ham. ex Dillw.) Mabb.	Bignoniaceae
121.	<i>Strobilanthes ciliatus</i> Nees	Acanthaceae
122.	<i>Swietenia macrophylla</i> King	Miliaceae
123.	<i>Syzigium zeylanica</i>	Myrtaceae
124.	<i>Syzygium caryophyllatum</i> (L.) Alston	Myrtaceae
125.	<i>Tabernaemontana divaricata</i> (L.) R. Br.	Apocynaceae
126.	<i>Tecoma stans</i> (L.) HBK	Bignoniaceae
127.	<i>Tectona grandis</i> L. f.	Verbanaceae
128.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae
129.	<i>Terminalia chebula</i> Retz.	Combretaceae
130.	<i>Terminalia cuneata</i> Roth	Combretaceae
131.	<i>Thunbergia erecta</i> (Benth.) Anders.	Acanthaceae
132.	<i>Thunbergia grandiflora</i> (Roxb. ex Rottl.) Roxb.	Acanthaceae
133.	<i>Tiliacora acuminata</i> (Poir.) Miers ex Hook.f. & Thoms.	Menispermaceae
134.	<i>Tinospora cordifolia</i> (Willd.) Miers.	Menispermaceae

135.	<i>Tradescantia spathacea</i> Sw.	Commelinaceae
136.	<i>Vinca rosea</i>	Apocynaceae
137.	<i>Vitex altissima</i> L. f.	Verbenaceae
138.	<i>Wattakaka volubilis</i> (L. f.) Stapf	Asclepiadaceae
139.	<i>Woodfordia fruticosa</i> (L.) Kurz	Lytraceae
140.	<i>Wrightia tinctoria</i> (Roxb.) R. Br.	Apocynaceae
141.	<i>Ziziphus oenoplia</i> (L.) Mill.	Rhamnaceae
142.	<i>Ricinus communis</i>	Euphorbiaceae
<b>Gymnosperms</b>		
143.	<i>Cycas circinalis</i> L.	Cycadaceae
144.	<i>Cycas revoluta</i>	Cycadaceae
145.	<i>Cycas zeylanica</i>	Cycadaceae
146.	<i>Podoarpus</i> ( Two species)	podocarpaceae
147.	<i>Dioon Sp.</i>	Cycadaceae
148.	<i>Pinus sp.</i>	Pinaceae
149.	<i>Agathis sp.</i>	Araucariaceae
150.	<i>Zamia</i> ( Three species)	Zamiaceae
151.		

#### New Additions

1.	<i>Alstonia venenata</i> R. Br.	Apocynaceae
2.	<i>Ardisia littoralis</i> Andr.	Myrsinaceae
3.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae
4.	<i>Citrus sp.</i>	Rutaceae
5.	<i>Clerodendrum infortunatum</i> L.	Verbenaceae
6.	<i>Clitoria ternatea</i> L.	Fabaceae
7.	<i>Desmodium motorium</i> (Houtt.) Merr.	Fabaceae
8.	<i>Dillenia suffruticosa</i> (Griff.) Mart.	Dilleniaceae
9.	<i>Fagraea ceilanica</i> Thunb.	Loganiaceae
10.	<i>Justicia adhatoda</i> L.	Acanthaceae
11.	<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae
12.	<i>Nerium oleander</i> L.	Apocynaceae
13.	<i>Ophiorrhiza mungos</i>	rubiceae
14.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae
15.	<i>Santalum album</i> L.	Santalaceae
16.	<i>Cycas zeylanica</i>	Cycadaceae
17.	<i>Podoarpus</i> ( Two species)	podocarpaceae
18.	<i>Dioon Sp.</i>	Cycadaceae
19.	<i>Pinus sp.</i>	Pinaceae
20.	<i>Agathis sp.</i>	Araucariaceae
21.	<i>Zamia</i> ( Three species)	Zamiaceae

Pteridophytes - 22 species, Nepanthus etc..

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