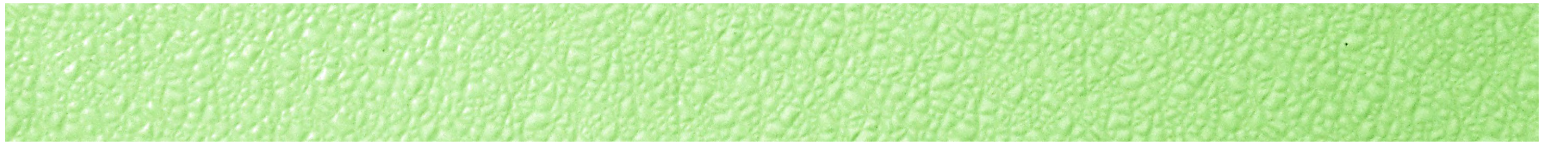




ENVIRONMENT AUDIT REPORT

ST. STEPHEN'S COLLEGE
Pathanapuram

2024



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ENVIRONMENT AUDIT REPORT

ST. STEPHEN'S COLLEGE

PATHANAPURAM

2024





Environment Audit Report
St. Stephen's College, Pathanapuram
Report No: EA 1195
2024

Environment Audit Team

Ottotractions

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2	Er. B. Zachariah	Director, Ottotractions
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5	Er. Vishnu S S	Project Engineer, Ottotractions
6	Anjana B S	Project Assistant, Ottotractions

About OTTOTRACTIONS

Established in 2005, OTTOTRACTIONS is a renowned organization with extensive expertise in energy, engineering, and environmental services. We hold the distinction of being the first Accredited Energy Auditor from Kerala authorized to conduct Mandatory Energy Audits for Designated Consumers under the Energy Conservation Act of 2001. Our excellence in energy auditing was recognized by the Government of Kerala with the prestigious "Kerala State Energy Conservation Award 2009."

OTTOTRACTIONS is an ISO 9001:2015, ISO 17020:2012, ISO 14001:2015 and ISO 14067: 2018 certified organization, underscoring our commitment to quality and excellence in service delivery. With a proven track record, we have successfully completed over 3,000 audits across various domains, including Energy Audit, PAT, Electrical Safety Audit, Green Audit, Environmental Audit, Biodiversity Audit, Water Audit, and Air Audit.

Acknowledgement

We were privileged to work together with the administration and staff of St. Stephen's College, Pathanapuram 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

St. Stephen's College, Pathanapuram has entrusted Ottotractions to carry out an environment 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. Stephen's College, Pathanapuram Established in 1964 after the name of Saint Stephen, the college is the fulfilment of a long-cherished desire of its founder, His Grace Mar Thoma Dionysius, Metropolitan of Niranam Diocese of the Malankara Orthodox Church. The College, affiliated to the University of Kerala, offers undergraduate programmes in Botany, Chemistry, Mathematics, Physics, Zoology,

Economics, English and Commerce and postgraduate programmes in Botany, Chemistry, Mathematics, Physics and Zoology. The department of Zoology and Chemistry are recognized as Research Centres under the University of Kerala. The college was re-accredited by the NAAC Peer team at B++ Grade with CGPA 2.91 in 2022.

The college aims at the development of an integrated personality. The College Chapel serves as the nerve centre for ethical development. The college has a well-equipped library with more than books. It has a fine volley ball court. There are many academic and cultural societies and clubs functioning in the college to kindle interest in the students in their respective subjects as well as in socially relevant issues.

Occupancy Details	
Particulars	2023-24
Total Students	698
Staffs	77
Total Occupancy of the college	775

Total student strength of the campus is 698. 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. The 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 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. The degradable waste can treated in the biogas plant.

Degradable Waste Generation	
St. Stephen's College, Pathanapuram	
Particulars	2023-24
Total Occupancy	775
Waste generated in kg /day	15.5
Waste generated in kg /Yr	3410

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.

Solid non degradable Waste Generation	
St. Stephen's College, Pathanapuram	
Particulars	2023-24
Total Occupancy	775
Waste paper generated in kg /day	0.155
Waste plastic generated in kg /day	0.2325
Waste paper generated in kg /Yr	34.10
Waste plastic generated in kg /Yr	51.15

WASTE MINIMIZATION AND RECYCLING		
1	Does your institute generate any waste?	Yes, Solid waste, Canteen Waste paper, plastic, Horticulture Waste etc.
	If so, what are they?	
2	What is the approximate amount of waste generated per day? (in Kilograms/) (approx.)	17
3	How is the waste generated in the institute managed? By	Reuse of one side printed Paper for internal communication. 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 Nature Club, Exhibition and 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	
2	Do students spend time in the garden?	Yes	
3	Total number of Plants in Campus	Plant type	Approx. number
		Trees	125
		Ornamental	Not estimated
4	Number of Tree Plantation Drives organized by School per annum. (If Any)	Yes, through Nature club plantation drives are organized.	
5	Number of Trees Planted in Last FY.	15	
	Survival Rate	90%	

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

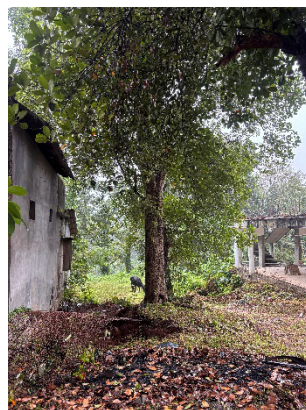
carbon sequestrated by a tree can be calculated by different methods. In this study, the volumetric approach was taken into account, thus the details including CBH (Circumference at Breast Height), height, average age, and total number of the trees, are required. Detailed table is included in the technical supplement.

Carbon Sequestration	
Particulars	2023-24
Total No of Trees	125
Carbon sequestrated by trees in the campus (tCO ₂ e)	8.15

Carbon sequestrated 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 CO₂ sequestrated in the tree
- Determining the weight of CO₂ sequestrated in the tree per year

Carbon sequestrated 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 0.06 kg per year. 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. All energy efficiency projects shall be implemented, So, the effective specific carbon emission per student is -10.54 kg of CO₂ per year only. 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

Electricity Connection Details		
St.Stephen's College, Pathanapuram		
1	Name of the Consumer	St.Stephen's College, Pathanapuram
2	Tariff	LT-6A/ Three
3	Consumer Numbers	1146853002589
		1146853002590
		1146853002574
		1146855002571
		1146856002005
		1146856001985
		1146853018642
1146851002004		
4	Connected Load Total (kW)	122
5	Annual Electricity Consumption (kWh)	19356

Annual Electricity Consumption (kWh)			
SI No	Consumer No	2023-24	Connected Load (kW)
1	1146853002589	10710	59
2	1146853002590	1664	27
3	1146853002574	3731	12
4	1146855002571	78	12
5	1146856002005	583	2
6	1146856001985	156	5
7	1146853018642	12	1
8	1146851002004	2422	5
TOTAL		19356	122

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, College is 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 was installed 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

Solar power plant can be installed in the campus which helps offsetting the carbon foot print. The details of these projects are given in the concerned chapters.

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.

OTTOTRACTIONS- ENERGY AUDIT						
St.Stephen's College, Pathanapuram						
Greenhouse Gas Mitigation through Major Energy Efficiency Projects						
Sl No	Projects proposed	Energy saved(Yearly)		Sustainability (Years)	First year ton of CO2 mitigated	Expected Tons of CO2 mitigated through out life
		(kWh)	MWh			
1	Energy Saving in Lighting by replacing existing 39 No's T8 (40W) Lamps to 18W LED Tube	823.68	0.82	10	0.60	6.01
2	Energy Saving in Lighting by replacing existing 38 No's T12 (55W) Lamps to 18W LED Tube	1008.22	1.01	10	0.74	7.36

3	Energy Saving by replacing existing 193 No's in-efficient ceiling fans with Energy Efficient Five star fans	8301	8.30	10	6.06	60.59
Total		10132	10	10	7.40	73.97

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
	4. Others – Lab
How does your institute store water? Are there any water saving techniques followed in your institute?	Overhead Water Tanks and Sumps installed for storage of water.
	Rain Water Harvesting system in place
If there is water wastage, specify why and How can the wastage be prevented / stopped?	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?	Yes

General Environmental Awareness Questionnaire	
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?	No
Dose Environmental Water and Wastewater Quality monitoring conducted by the Institute?	Yes
Dose stack monitoring of DG sets conducted by the Institute?	No
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
Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes
Does Institute participate in National and Local Environmental Protection Movement?	Yes
Does the institute have any Recognition/certification for environment friendliness?	Yes
Does the institute use renewable energy?	Yes
Does the Institution conduct 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)

Best Practices and Initiatives	
Renewable Energy	Yes
Solar Power Plant	Yes
Energy Audit and Green Audit Conducted	Yes
Biogas Plant installed	Yes
Biodiversity Conservation	Yes
Green Cover	Yes
Tree Plantation Drives	Yes
ECO clubs	Yes
Groundwater Recharge	Yes
Rain Water Harvesting System.	Yes
Pollution Reduction Public Transportation	Yes
E Waste Management	Yes
Connected to authorized recycler	Yes
Solid Waste Management	Yes
Lifting of garbage from the campus on alternate days by the Municipal Corporation.	Yes
Adoption of Village	No
CSR	Yes
Water Conservation	Yes
Energy Conservation	Yes



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 of 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. A Water Meter should be installed at the 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 a wide range of issues related to Environmental aspects. The audit has identified several observations for making the campus premise more environmentally friendly. The recommendations are also mentioned with observations for St. Stephen's College, Pathanapuram team to initiate actions.

Carbon Foot Print			
Sl. No.	Particulars	2023-24	tCO ₂ e
1	Electricity (kWh)	19544	16.03
2	Diesel (L)	63	0.20
3	LPG (kg)	180.00	0.27
4	Biogas (kg)	165.00	0.231
5	Degradable Waste in kg/yr.	3410.0	2.15
6	Paper Waste in kg/yr	34.10	0.02
Total Carbon Foot Print tCO₂e/yr			18.89

Net Carbon Emission after implementing Energy Efficiency projects and Renewable Energy Projects Proposed		
1	Total Carbon Foot Print tCO ₂ e/yr	18.89
2	Carbon Sequestered tCO ₂ e/yr	8.15
3	Carbon mitigated by Renewable Energy tCO ₂ e/yr (Installed)	10.71
4	Carbon mitigated by Renewable Energy tCO ₂ e/yr (Proposed)	0.00
5	Carbon mitigated by Energy Efficiency (Proposed) tCO ₂ e/yr	7.40
6	Effective Carbon footprint tCO ₂ e/yr	-7.36
7	Total No of Students	698
8	Specific Carbon Footprint kg CO ₂ e/Student/Yr	-10.54

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 an environmental perspective. There are no major observations but few things are important to initiate urgently are waste management records by monthly inventory of hazardous waste, 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

Form 5																
Sl No	Name of the tree	Circumference (cm)	Radius (cm)	Radius (m)	Height (m)	Trunk volume (m ³)	Trunk Biomass (Ton)	Root biomass (Ton)	Total biomass (Ton)	Tree dry weight (Ton)	Carbon content of the tree (Ton)	Carbondioxide Sequestered (Ton)	No of Similer trees	Carbondioxide Sequestered (Ton) for all similer trees	Age of the tree (Years)	Carbon request erred per year (Ton)
1	Jack Fruit	135	21.50	0.21	2.10	0.30	0.16	0.21	0.37	0.27	0.12	0.48	2	0.95	3	0.32
2	Anjili	127	20.22	0.20	2.80	0.36	0.19	0.25	0.44	0.32	0.14	0.56	4	2.25	4	0.53
3	Mahagoni	95	15.13	0.15	3.96	0.28	0.15	0.20	0.35	0.25	0.11	0.44	4	1.78	4	0.47
4	Mahagoni	57	9.08	0.09	6.00	0.16	0.08	0.11	0.19	0.14	0.06	0.24	4	0.97	3	0.33
5	Teak	54	8.60	0.09	6.20	0.14	0.08	0.10	0.18	0.13	0.06	0.22	13	2.92	5	0.59
6	Cocunut tree	54	8.60	0.09	5.30	0.12	0.07	0.09	0.15	0.11	0.05	0.19	11	2.11	4	0.51
7	Vatta	56	8.92	0.09	7.10	0.18	0.09	0.12	0.22	0.16	0.07	0.28	1	0.28	2	0.12
8	Jack Fruit	55	8.76	0.09	3.96	0.10	0.05	0.07	0.12	0.09	0.04	0.15	1	0.15	2	0.07
9	Cinnamomum	54	8.60	0.09	3.10	0.07	0.04	0.05	0.09	0.06	0.03	0.11	2	0.22	2	0.10
10	Teak	57	9.08	0.09	6.60	0.17	0.09	0.12	0.21	0.15	0.07	0.27	1	0.27	2	0.12
11	Teak	45	7.17	0.07	5.30	0.09	0.05	0.06	0.11	0.08	0.03	0.13	1	0.13	2	0.06
12	Acacia	61	9.71	0.10	4.20	0.12	0.07	0.09	0.15	0.11	0.05	0.19	1	0.19	2	0.09
13	Badam	53	11.20	0.11	3.30	0.13	0.07	0.09	0.16	0.12	0.05	0.20	1	0.20	2	0.09
14	Vatta	46	7.32	0.07	6.00	0.10	0.05	0.07	0.12	0.09	0.04	0.16	1	0.16	2	0.07
15	Cotton Tree	45	7.17	0.07	3.00	0.05	0.03	0.03	0.06	0.04	0.02	0.08	1	0.08	2	0.04
16	Aranamaram	45	7.17	0.07	3.70	0.06	0.03	0.04	0.07	0.05	0.02	0.09	19	1.77	4	0.47
17	Aranamaram	53	8.44	0.08	6.80	0.15	0.08	0.11	0.19	0.14	0.06	0.24	19	4.51	7	0.69
18	Yellow gulmohar	108	17.20	0.17	6.20	0.58	0.31	0.40	0.71	0.51	0.23	0.90	3	2.70	5	0.57
19	Nelli	66	10.51	0.11	5.80	0.20	0.11	0.14	0.25	0.18	0.08	0.31	1	0.31	2	0.14
20	Cheruthekk	54	8.60	0.09	6.20	0.14	0.08	0.10	0.18	0.13	0.06	0.22	1	0.22	2	0.10
21	Rubber	55	8.76	0.09	5.80	0.14	0.07	0.10	0.17	0.12	0.06	0.22	10	2.18	4	0.52
22	Tamerind	47	7.48	0.07	3.96	0.07	0.04	0.05	0.09	0.06	0.03	0.11	1	0.11	2	0.05
23	Bread Fruit Tree	45	7.17	0.07	6.00	0.10	0.05	0.07	0.12	0.09	0.04	0.15	1	0.15	2	0.07
24	Mahagoni	61	9.71	0.10	6.20	0.18	0.10	0.13	0.23	0.16	0.07	0.29	1	0.29	2	0.13
25	Mahagoni	53	10.90	0.11	5.30	0.20	0.10	0.14	0.24	0.18	0.08	0.31	1	0.31	2	0.13
26	Mahagoni	47	7.48	0.07	5.10	0.09	0.05	0.06	0.11	0.08	0.04	0.14	2	0.28	2	0.12
27	Mahagoni	45	7.17	0.07	3.96	0.06	0.03	0.04	0.08	0.06	0.03	0.10	1	0.10	2	0.05
28	Anjili	45	7.17	0.07	3.10	0.05	0.03	0.03	0.06	0.04	0.02	0.08	5	0.39	2	0.16
29	Jack Fruit	56	8.92	0.09	6.60	0.16	0.09	0.12	0.20	0.15	0.07	0.26	1	0.26	2	0.11
30	Jack Fruit	79	12.58	0.13	5.30	0.26	0.14	0.18	0.32	0.23	0.11	0.41	1	0.41	2	0.17
31	Mahagoni	88	14.01	0.14	4.20	0.26	0.14	0.18	0.32	0.23	0.10	0.40	1	0.40	2	0.17
32	Mango Tree	66	10.51	0.11	3.30	0.11	0.06	0.08	0.14	0.10	0.05	0.18	1	0.18	2	0.08
33	Mahagoni	43	6.85	0.07	6.00	0.09	0.05	0.06	0.11	0.08	0.04	0.14	1	0.14	2	0.06
34	Mahagoni	57	9.08	0.09	4.00	0.10	0.05	0.07	0.13	0.09	0.04	0.16	1	0.16	2	0.07
35	Mahagoni	52	8.28	0.08	3.70	0.08	0.04	0.06	0.10	0.07	0.03	0.12	1	0.12	2	0.06
36	Mahagoni	44	7.01	0.07	6.80	0.10	0.06	0.07	0.13	0.09	0.04	0.16	1	0.16	2	0.08
37	Mahagoni	86	13.69	0.14	8.20	0.48	0.26	0.34	0.59	0.43	0.19	0.75	1	0.75	3	0.27
38	Mahagoni	39	6.21	0.06	7.80	0.09	0.05	0.07	0.12	0.08	0.04	0.15	1	0.15	2	0.07
39	Mahagoni	42	6.69	0.07	7.21	0.10	0.05	0.07	0.12	0.09	0.04	0.16	1	0.16	2	0.07
40	Mahagoni	97	15.45	0.15	4.20	0.31	0.17	0.22	0.39	0.28	0.13	0.49	1	0.49	2	0.20
Total						6.57	3.48	4.60	8.08	5.86	2.64	10.26	125	29	3	8.15

NATIONAL SERVICE SCHEME

Unit No 32 A & B

St. Stephen's College, Pathanapuram

REGULAR ACTIVITY REPORT FOR THE YEAR 2023-2024

The National Service Scheme (NSS) is a Central Sector Scheme of the Government of India, Ministry of Youth Affairs & Sports. The sole aim of the NSS is to provide hands-on experience to young students in delivering community service. The Regular activities of National Service Scheme Unit No 32 A & B of St. Stephens College, Pathanapuram for the year 2023-2024 is as below:

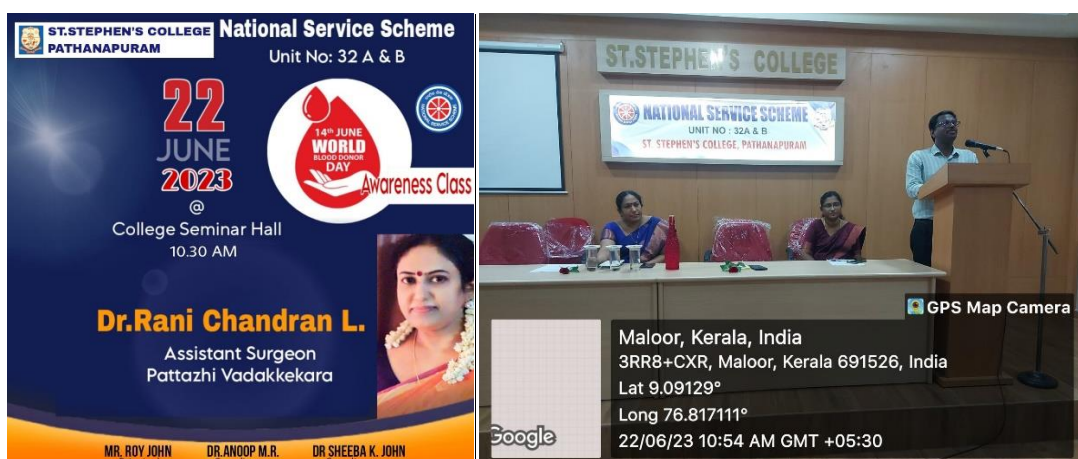
1. World Environmental Day Celebration

The NSS unit of St. Stephen's College conducted an Essay Writing Competition in connection with World Environmental Day on 06 June 2023 at 2.30 pm in Room No.61. 14 Participants were participated.



2. World Blood Donor Day Celebration

The NSS unit of St. Stephen's College conducted an awareness class in connection with World Blood Donor Day on 22nd June 2023 at 10.30 am in Aprem Ramban Seminar Hall. Dr. Ranichandran L (Assistant Surgeon, Pattazhi Vadakkekara) was the Chief Guest. The Presidential address was conducted by Mr. Roy John (Principal, St. Stephen's College, Pathanapuram), Welcome speech by the NSS P.O Dr. Sheeba K. John and Vote of thanks was given by NSS Volunteer Prasida P.S. 83 NSS volunteers were participated.



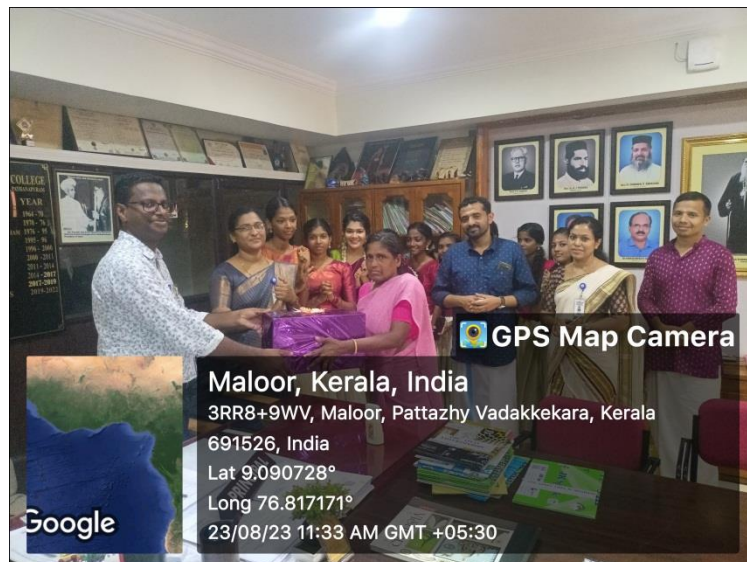
3. Anti Drug Awareness Programme

The NSS unit of St. Stephen's College in association with anti drug committee conducted an awareness programme about anti drug on 04/07/2023 at Room No.47. NSS volunteers presented their ideas for a 10 min. speech. 80 NSS volunteers participated in this programme.



4. Charity

In connection with Onam celebration of our college, the NSS volunteers donated a 'MIXER GRINDER' to Ms.Sulochana on 23/08/2023.



5.Awareness Class

Drug awareness class was conducted on 29th September 2023 at Aphrem Ramban Seminar Hall at 10.30am by Pathanapuram excise division and NSS unit of St. Stephen's College. Excise officers Mr. Muhammed Ansari and Mr. Arunkumar were the Chief Guests. After that a Quiz competition was held by excise department. First year students Mr. Ramananth from Chemistry department & Ms. Sruthy from Zoology Department got first and second prizes. 85 NSS volunteers were participated in this programme.



6.KERALA PIRAVI PROGRAMME

NSS Unit of St Stephen's College, Pathanapuram on 3rd October 2023 at 11:00 am conducted a Seminar on Kerala Piravi Day and Malayalam Language Day. In this program Mr. Linu Joshi, Ms. Ramadevi .V. P and Ms. Aswathy. M. G were the chief guests. After that, Syriac language teacher Father George Mathew welcomed everyone and Principal Mr. Roy John presided over the seminar. Then the Panchayat President Ms. Ramadevi . V.P inaugurated the programme. Later, Panchayat member and alumna of St. Stephen's College Ms. Ashwathi M.G. gave her greetings to all. After that, the main speaker and honorable teacher Mr. Linu Joshi started the Seminar. He was able to present the classes to the students in a very attractive manner. 65 NSS volunteers were participated in this programme.



7. Campus Cleaning

A college level campus cleaning was conducted by the NSS volunteers on 06/10/2023. 100 NSS volunteers were participated in this programme



8. Legal Awareness Class

The NSS unit of St.Stephens College, Pathanapuram Organized a Legal Awareness Class on 10/10/2023. Adv. Jismol Kallukadavil was the chief guest. 100 NSS volunteers were participated in this programme



9. Quiz Competition

As a part of Excise department of kollam district, district level quiz programme was conducted at SN college, kollam on 21st October 2023 at 10 am. From B.Sc. first year students Ramnadh and Sruthy were selected from St Stephen's college to attend the quiz programme



10.AIDS AWARENESS DRAMA

The NSS unit of St.Stephens College, Pathanapuram conducted an ‘AIDS AWARENESS DARMA’ on 26/10/2023. It was organized by the Health Center, Pathanapuram & presented by the members of Kalakshethra, Pathanamthgitta. All the students from the college participated in this programme.



11.Celebration of Vigilane Awareness Day

The NSS unit of St.Stephens College, Pathanapuram celebrated the ‘VIGILANCE AWARENESS DAY’ on 03/11/2023. A poster presentation programme was arranged by the volunteers. 25 NSS volunteers prepared their posters and presented.



12. ORIENTATION CLASS

The NSS unit of St.Stephens College, Pathanapuram Organized an Orientation Class for First Year students on 20/11/2023 at 1.30pm. Mr. Dennis John(HSST Economins) was the chief guest. 100 NSS volunteers were participated in this programme.



13. CELEBRATION OF HUMAN RIGHTS DAY

The NSS unit of St.Stephen’s College, Pathanapuram conducted a poster making competition in connection with International human rights day on 10-12-23, 10:30 am at NSS office .The program was inaugurated by NSS Programme Officer Dr. Sheeba K John. 20 NSS volunteers attended in this programme.



14. CAKE FEST

The NSS unit of St.Stephen’s College, Pathanapuram Organized a ‘CAKE FEST’ in association with Vipani, Women’s Cell & College Union on 21/12/2023 at 10.30am. Mr. Roy John, Principal (St.Stephen’s College, Pathanapuram) was the Chief Guest. 100 NSS volunteers were participated in this programme.



15. CHARITY

The NSS unit of St.Stephen's College, Pathanapuram distributed stationary items to three families from the income generated from the 'CAKE FEST' on 22/12/2023 at 10.30am. All the NSS volunteers were participated in this programme.



16.MY BHARATH LINK REGISTRATION

The NSS Unit of St Stephen's College, Pathanapuram organized My Bharat link registration class on 8th January 2024 at 11:00 am at Room No.47. The NSS volunteer welcomed everyone and the NSS Programme Officer Dr. Sheeba K John presided over the class. The vote of thanks was done by one of the NSS volunteer. Around 100 NSS volunteers attended the program.



17. Campus Cleaning

A college level campus cleaning was conducted by the NSS volunteers on 13/01/2024. 100 NSS volunteers were participated in this programme.



18. CELEBRATION OF NATIONAL YOUTH DAY

The NSS unit of St. Stephen's college, pathanapuram organized National Youth Day program at NSS office on 16th January 2024 at 10:30 a.m. The program was inaugurated by NSS coordinator Dr Sheeba K John. As part of National Youth day, NSS unit decide to conduct an essay writing competition about National Youth day and 20 NSS volunteers attended the program.



19. AWARENESS CLASS ON GENDER EQUALITY

The NSS unit of St.Stephen's College, Pathanapuram Organized Gender relations and self defence training class on 24th January 2024 at Aprem Remban seminar hall at 10:20 am. The Chief Guest was Ms Arathy Mohan who is the founder of LAMBDA Thapas. This programme started with the NSS song. Dr.Sheeba.k.John Programme Officer of NSS unit welcomed the chair. Then the honourable College Principal Mr.Roy John delivered the inaugural address. After that the Keynote speaker of the program Ms. Arathy Mohan led the training class. The program was then concluded by the vote of thanks which was done by NSS volunteer.100 NSS volunteers participated in this programme.



20. CELEBRATION OF SOCIAL JUSTICE DAY

NSS unit of St. Stephen's college, pathanapuram conducted World social justice day program at NSS office on 21th February 2024 at 10:30 am. The program was inaugurated by NSS PO Dr. Sheeba K John. As part of World day of social justice, NSS unit decide to prepare posters about World day of social justice and around 20 NSS volunteers attended the program.



21. Celebration of international Womens Day

The NSS unit of St. Stephen's College, Pathanapuram conducted an essay writing competition in International Women's day on 07-03-24, 10:30 am at NSS office on the topic based on "Invest in women : Accelerate progress". The program was inaugurated by NSS PO Dr Sheeba K John. Around 25 NSS volunteers attended in this program



22. SKILL DEVELOPMENT TRAINING PROGRAMME

As a part of Pathanapuram St Stephen's College NSS unit a skill development class was held on 11- 03 -2024, 2.30 pm for the first year students at Room no: 46. In this programme the main objective was to make the students about to find their skill development abilities and to know various skills and tricks in designing arts. The programme was welcome by cordinator of NSS program Dr. Sheeba.K.John and the programme was inaugurated by Dr.Sherin Alex who is the Assistant Professor in Chemistry Department. Then Dr. Sherin Alex conducted the skill development class which was well interactive and had all primary information about topic which students needed.



Nature club activities 2023-24 - Report

Nature club teaches students to love their nature and conserve the resources in it. This organization is focused on increasing students understanding and appreciation of nature and raising awareness about the consequences of human activities on the natural world. Also, nature club aims at inculcating an appreciation of nature among students and encouraging them to participate in a variety of conservation initiatives.

An executive meeting of nature club unit was held on July 31st 2023. Class representatives were participated and a whatsapp group were created and interested students from different streams were joined the club. Aarathy A.S, 2nd year BSc Botany and Althaf Muhammad M.S, 1st year BSc Botany were selected as secretary and joint secretary respectively.

The inaugural programme of nature club 2023-24 was held on 29th November 2023 10:30am at college seminar Hall. The chief guest of the meeting was Mr. Dinesh S, Deputy Forest conservator (RTD) Kollam. Principal incharge Dr.Blessy John inaugurated the Nature club unit and addressed the gathering. Mr.Sandhu John Sajan, IQAC Coordinator was felicitated the section.

The nature awareness programme was conducted by nature club jointly with social forestry Extension unit Kollam. Mr. Dinesh S, Deputy Forest conservator (RTD) gave an informative talk about nature conservation. K. S Harilal, Deputy Forest range officer, Mr.Reji S.R, Section forest officer were actively participated in the awareness programme. 81 students from various departments were actively participated.

Pathanapuram
18/03/25

Ms.Chinju Merin Abraham
Nature club Coordinator

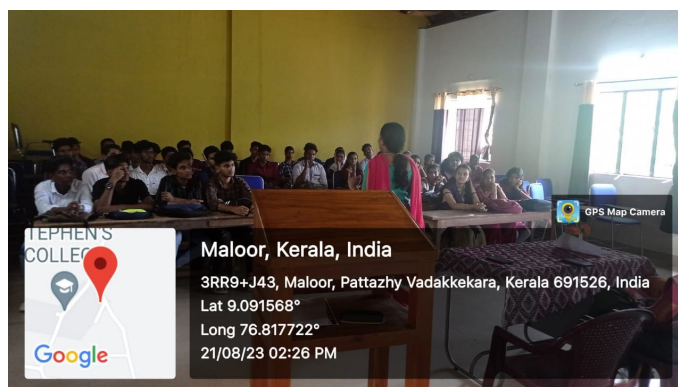
Report of Entrepreneurship Development Club 2023-2024

Entrepreneurship Development Clubs have been formulated in colleges to inculcate Entrepreneurial Culture amongst youth and equip them with the skills, techniques and confidence to act as torch-bearers of entrepreneurship of the new generation. ED Club conducts programmes to inculcate entrepreneurship qualities, to sensitise industrial scenario of the state, to nurture the latent entrepreneurial talent, develop awareness among its members of the attitudes, values, and skills of successful entrepreneurs around the globe etc.

ED club of St. Stephen's College, Pathanapuram has conducted many programmes during the academic year 2023-24 with the above objectives.

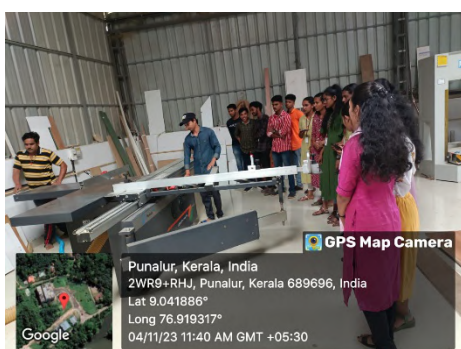
1. Celebration of World Entrepreneurship Day (21.09.2023)

Every year, August 21 is celebrated as World entrepreneurship Day to recognise the risk takers and trailblazers who transforms ideas into reality. This year ED club of the college in association with the Department of Commerce and under the auspices of Institutional Innovation Council (IIC) conducted an experience sharing programme to celebrate the Day. Ms. Athira G. K, II Year M. Sc Physics of our college shared her journey from an ordinary student to student entrepreneur. She is the proprietor of Shiva Food Products and also a member of ASAP Skill Development Executive. Her journey of courage and willpower kindled the entrepreneurial attitude of the aspiring entrepreneurs. 38 students and five teachers participated in the programme.



2. Industrial Visit (04.11.2023)

The ED club in association with the Department of Commerce visited Kerala Industrial Infrastructure Development Corporation (KINFRA), Punalur unit. The industrial visit aimed at helping the aspiring entrepreneurs to prepare for their future work positions by exposing them to practical challenges. The team of 40 students led by Dr. Deepa T. S and Mr. Blesson Mathew visited two industrial units working at



KINFRA-M/s Golden Cherry International and M/s Design IT interiors. The students interacted with the entrepreneurs and workers there. The production processes were exhibited and explained to the team by the staff. The visit was really helpful for the students.

3. National Entrepreneurship Day Celebration (09.11.2023)

The ED club in association with the Department of Commerce organised a seminar on “Entrepreneurial Opportunities under DIC” in connection with the National Entrepreneurship Day. Mr. John Mathew, Assistant District Industries Office, Pathanapuram delivered the keynote address. He emphasised the role of DIC in the context of NAVA KERALA (New Kerala).



He encouraged students to take up risk and become a successful entrepreneur. 80 students and six faculty members participated in the programme.

4. One Day Workshop on “Creativity to Startups”

A workshop in association with Department of Economics and IEDC was conducted

on 19.03.2024 on “Creativity to Startups”. The session was handled by Mr. Jikku James, Nodal Officer, IEDC, St. Thomas College, Ranni.

DEPARTMENT OF BOTANY

REPORT OF ACTIVITIES

2023-2024

WORLD ENVIRONMENTAL DAY CELEBRATIONS-2023; 05 June 2023

The Department of Botany celebrated World Environment Day 2023. The theme for World Environment Day on 5 June 2023 focussed on solutions to plastic pollution under the campaign #BeatPlasticPollution. The event aimed to engage students, faculty members, and the wider community in thought-provoking discussions, educational activities, and initiatives that promote sustainable practices.

The event began with a welcome address by the Head of the Department Fr. Dr. Roy John, emphasizing the significance of World Environment Day and the role of botany in understanding and preserving the environment. The importance of plant diversity and its impact on ecosystem health were highlighted.



The programme was inaugurated by Roy John, Principal. He pointed out the need for conserving the nature in sustenance of life.

Poster Exhibition: Students displayed a series of informative posters that showcased various plant species, their ecological importance, and the threats they face. They also exhibited posters on the theme topic. The exhibition aimed to educate attendees about the delicate balance of nature and the importance of maintaining it.

By bringing together education, awareness, and practical initiatives, the celebration inspired attendees to be conscientious stewards of the environment and advocates for sustainable practices. Faculty members, research scholars and students participated in this programme.

SEMINAR ON PHYTOCHEMISTRY-07 JUNE 2023

A one-day seminar on "Phytochemistry: Exploring the Wonders of Plant Chemistry" was organized with the aim of providing participants with insights into the fascinating world of plant compounds and their significance in various fields. The seminar brought together academicians and students interested in the study of phytochemistry.

The seminar commenced with a warm welcome address by Fr. DR. Roy John, Head, Dept. of Botany. The chief guest emphasized the interdisciplinary nature of phytochemistry and its potential to address global challenges. The programme was inaugurated by Roy John, Principal.

Dr. Mammen Daniel, a distinguished phytochemist, delivered the keynote address. The presentation provided an overview of phytochemistry, its historical development, and its contemporary applications. He emphasized the critical role of phytochemical research in drug discovery, plant physiology, and ecological interactions.

The one-day seminar on phytochemistry provided a platform for fruitful discussions and knowledge exchange among participants. It underscored the significance of plant

compounds in various domains, from medicine and agriculture to food science and environmental conservation.



30.07.23 Alumni meet

An alumni meet of B.Sc 2001 batch was held on 30.07.23.

17.08.2023

PTA meeting of S5 B.Sc was held.

23.08.2023

Onam was celebrated by whole college. Department made floral carpet and conduct various competition for students.

PTA Meeting- Semester IV M.Sc. Botany 14 August 2023

Semester IV M.Sc. Botany PTA meeting was held on 14 August 2023 at College seminar hall. Teachers shared information about the classroom activities and student progress. The meeting provides an opportunity for the parents to raise their queries and share their ideas regarding student related activities.

PTA meeting for B.Sc Semester II(2022 admission) - 15th September 2023

A class PTA meeting was conducted on 15/09/23 Friday 10:00 am for the semester II U.G students at seminar hall. Ms.Chinju Mrin Abraham welcomed the gathering, Fr.Dr.Roy John (HoD) delivered the presidential address, Dr.Shibu P.Varughese & Dr.Praveen Dhar were addressed the parents and students. A total of 14 parents along with their wards and teaching faculties were attended the meeting. Semester II internal examination result was critically evaluated and conveyed to parents especially to failed students and slow learners. Feedback from parents were collected, open discussion and personal interaction were conducted and the meeting was concluded at 12:45 pm after tea.

One day training program was conducted for M.Sc 1 and 2 year students at National Institute for Rubber, Kottayam- 20th October 2023

One day training programme was conducted for P.G students on 20th October 2023 to the National Rubber Research Institute Kottayam, as a part of 'SHASTRADARSHAN' organised by the NIRT, Kottayam. Students visited the Agronomy and Soil division, Genomics division, Biotechnology lab, Botany Division, Microbiology lab, Physiology division, Pathology division and learned about the various equipment used in different scientific experiments and finally the processing and making of latex products were observed.

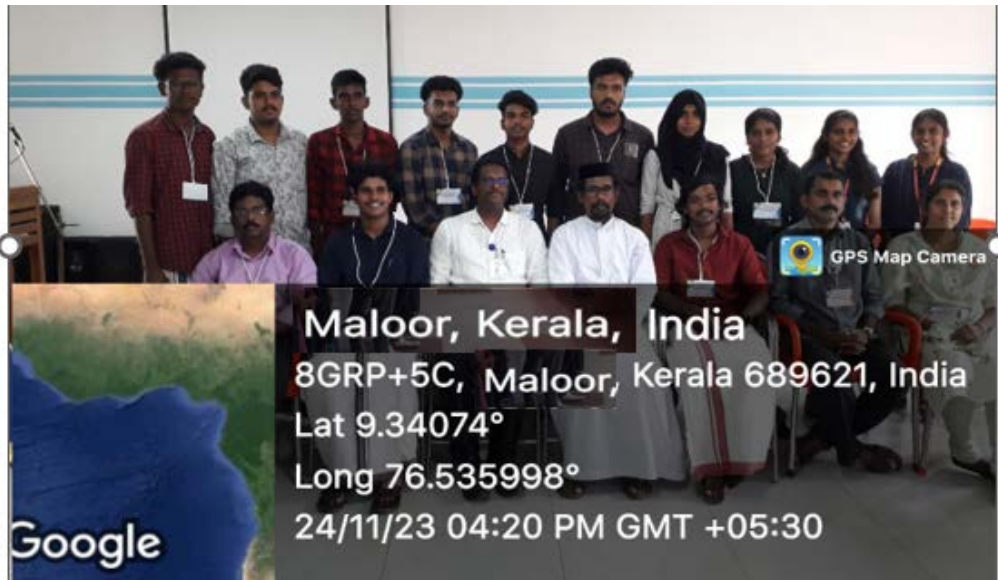


08.11.2023

One day workshop on “ Floristic diversity of the Western Ghats- Scope for Herbal technology start-ups”. Dr K B Rameshkumar, Principal Scientist, JNTBGRI, Plaode was resource person.

College Union Election 2023-2024; 24 November 2023

The Department of Botany conducted the College Union Election 2023-2024 on 24 November 2023. It was started with Notification of election on 10 November 2023 and proceeds with Publication of electoral roll, scrutiny of nominations, publication of final list of candidates, polling and counting of votes etc. The entire faculty members of the Department, including non teaching staff uphold fairness and transparency, and facilitate the smooth functioning of the election in accordance with the guidelines.



One Day seminar on “Nature Conservation” - 29th November 2023

As part of the nature awareness programme of the department a one day seminar and invited talk on “Nature conservation” was conducted jointly with Kerala Forest & Wildlife department, Social Forestry Extension unit Kollam on 29.11.23, 10:30am at seminar hall. Principal in-charge Dr.Blessy John inaugurated the meeting, chief guest and resource person of the meeting was Mr.Dinesh S, Deputy Forest Conservator(RTD) Kollam. Mr. K.S Harilal, Deputy Range forest officer; Mr.Reji S.R, Section forest officer and Mr. Sandhu John Sajan, IQAC Coordinator, felicitated the meeting. 81 students from various department were actively participated.

13.12.2024

Very Rev Aprem Ramban memorial lecture was held. Dr. Achuth Sankar S. Nair, Professor, Department of Computational Biology and Bioinformatics, University of Kerala delivered memorial talk.

M.Sc internship

One week internship for M.Sc students was held from 18.12.2024 to 23.12.2024 at Sangrose Laboratories Pvt Ltd, Mavelikara

25.01.2024

PTA meeting for B.Sc S5 was held.

22.03.2024

Inauguration of Botany Research Center

The University of Kerala has approved the Department of Botany, St Stephen's College, Pathanapuram as a research center in Botany. Kerala Transport Minister Sri K.B. Ganesh Kumar inaugurated the Center. Principal Mr Roy John welcomed the gathering. HG Dr Joseph Mar Dionysius, Metropolitan of Kollam Diocese delivered blessing speech. Very Rev Dr N J Koshy, Treasurer of Mount Tabor Diara presided over the meeting.

Seminar on Plant Diversity: Significance.

In the afternoon section Dr. Mathew Dan, Principal Scientist, JNTBGRI, Palode delivered a lecture on Plant Diversity: Significance. Faculties and students of the department actively participate in the meeting

Students Achievement

Ms Athira Prasad of B.Sc Botany 2017-2020 secured CSIR NET

Ms. Amrutha A, B.Sc. Botany 2017-2020 got staff selection recruitment and placed at Naval Base, Kochi.

Mr Robin J Raj of B.Sc 2019 get Job - Livestock officer in Animal Husbandry, Government of Kerala

6.OZONE DAY CELEBRATION(SEPT.16)



ST. STEPHEN'S COLLEGE

Maloor college p. o Pathanapuram
(Re.accredited with B++ grade by NAAC)

WORLD OZONE DAY

SEPTEMBER 16

POSTER EXHIBITION

Conducted by

**DEPARTMENT
OF
ECONOMICS**

MONTREAL PROTOCOL@35

GLOBAL CO-OPERATION PROTECTING LIFE ON EARTH

**For an increasingly
sustainable planet**

MONTREAL PROTOCOL | KIGALI AMENDMENT
FOR THE PROTECTION OF THE OZONE LAYER AND THE FIGHT AGAINST CLIMATE CHANGE

ST. STEPHEN'S COLLEGE, PATHANAPURAM

Annual Report- Energy Conservation Club (2023-2024)

The Energy Conservation Club at St.Stephen's College,Pathanapuram strives to foster awareness and action towards sustainable energy practices among students, faculty, and the broader community. Over the past year, we have diligently pursued our mission to promote energy conservation, educate others about its importance, and implement impactful initiatives within our campus.

Through our club's efforts, we aim to instil a culture of energy consciousness and responsibility among individuals, empowering them to make informed decisions and take meaningful actions towards conservation.

Conducted numerous awareness campaigns through workshops of LED making, seminars, and social media platforms to educate students and faculty about the importance of energy conservation.

Distributed informative materials and resources highlighting practical tips and techniques for energy-efficient living.

Energy Audits and Efficiency Measures:

Collaborated with campus facilities management to conduct energy audits, identifying areas for improvement and implementing energy-saving measures. Installed energy-efficient lighting systems such as LED's, implemented power management strategies, and promoted the use of renewable energy sources such as solar panel where feasible.

Student Engagement Initiatives:

Organized interactive events and competitions to actively engage students in energy conservation efforts. Also, in association with National Energy Conservation Day Celebrations, there was hosted a Power Point Competition on 21th December 2023 at 11.30 am under the auspices of the Energy conservation club and Post Graduate Department of Physics, where students showcased their innovative ideas and solutions for energy conservation through presentations.

Winners were awarded for their creativity and contributions towards sustainability.

Future Directions:

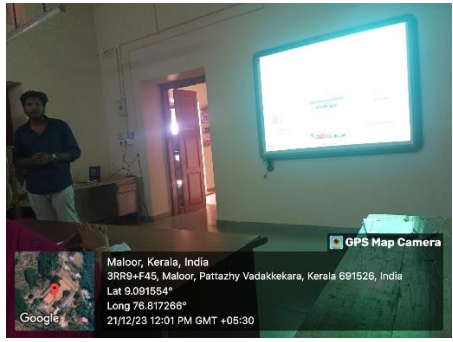
Looking ahead, the Energy Conservation Club is committed to expanding its impact and continuing to spearhead efforts towards a more sustainable and energy-efficient campus. We will seek to strengthen partnerships, enhance educational initiatives, and implement innovative solutions to further our mission of promoting energy conservation and environmental stewardship.

National Energy Conservation day celebrations
 Pooja Pooja Resonance
 Student Participants

Date : 21.12.2023
 Venue : Physics Seminar Hall

Sl No.	Name of Participant	Class	Signature	Sl No.	Name of Teacher	Teacher's Participation Department	Signature
1	Manish V Nair	SS Pg physics		1	Dr. Pournami P.	Zoology	
2	Parvathy S	"		2	Dr. Anoop M.R.	Chemistry	
3	Atharva S	"		3	Ms. Shikha Krishna	Physics	
4	Biji Krishna	"		4	Dr. Pillai Aswathy Mohan	Physics	
5	Sneha Saji	"		5	Dr. Mary Varughese	Physics	
6	Abinshan	"					
7	Jasleen	"					
8	S. Lakshmanan R.	SI Pg Physics					
9	Soni	"					
10	Alana S.P	SI Pg physics					
11	Amritha T.A	"					
12	Vysali B	"					
13	Angel Thomas	"					
13	Amisha	"					





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