ENVIRONMENTAL AUDIT REPORT

November 2018

SACRED HEART COLLEGE

THEVARA

Executed by

OTTOTRACTIONS
ergy-Engineering-Environment

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OTTOTRACTIONS
Energy-Engineering-Environment

Certification

This is to certify that

The Ottotractions has conducted Environmental Audit of Sacred Heart College, Thevara, Ernakulam for the year 2018.

This is to certify that the data collection has been carried out diligently and truthfully. All reasonable professional skill, care and diligence had been taken in preparing the environmental audit report and the contents thereof are a true representation of the facts. Adequate training provided to personnel involved in daily operations after implementation of recommendations.

Er. B V Suresh Babu
Accredited Energy Auditor,
Bureau of Energy Efficiency.

OTTOTRACTIONS TRIVANDRUM Accredited Energy Auditor, AEA-33

Dated this 18th day of December 2018
Thiruvananthapuram

OTTOTRACTIONS
Energy-Engineering-Environment

Environment Audit Report
SACRED HEART COLLEGE, THEVARA
November 2018

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.

Green Audit Team

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Acknowledgment

We were privileged to work together with the administration and staff of Sacred Heart College, Thevara for their timely help extended to complete the audit and bringing out this report. We thank Rev. Dr. Johnson X. Palackappillil CMI, Principal and Dr. K M Johnson, IQAC Coordinator& HOD, English for their advises and support during audit.

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

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INTRODUCTION

Ottotractions was asked by the Sacred Heart College, Thevara 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.

BACKGROUND

The Sacred Heart college established in 1944 by the CMI missionary fathers – reputed educational pioneers managing over 500 educational institutions across India and abroad - on the enchanting shores of Vembanadu backwaters on Thevara Island in Kochi, surrounded by lush greenery and located away from urban bustle, the 3-storeyed majestic structure on the eleven acre campus, spacious in dimensions, simple and elegant in design, is an aesthetic treat. Ever since its origin, the college - fondly called 'Thevara College'- has followed its core philosophy: holistic vision, i.e., harmony of the intellectual,

physical and spiritual endeavors enshrined nits motto, *cor rectum inquirit scientiam* (a righteous heart seeks after wisdom).

The college was awarded the highest rating of **FIVE STAR** in the NAAC accreditation in 2000, and in the 2007 re-accreditation, the feat was replicated with **A+ (91.7)**. In 2013, the college was awarded **A Grade** (CGPA 3.30). In the NIRF ranking the College has always found a place among the first 60 Colleges. Academically the college's record has been consistent and commendable, with top ranks and cent percent results almost a routine in many branches such as English, Commerce, Economics, Physics and Zoology.

On the sporting arena, the college's credentials have been unrivalled maintaining I or II position in the MG University in games for the past many years, with many of our sportspersons representing the University, the State and the Country. In the University Youth Festival, the College has been the champions consistently for the past three years.

In the national surveys, for the **Best Fifty Colleges**, undertaken by prestigious media agencies such as *The Week*, and *India Today*, Sacred Heart College was ranked one among the best 30 colleges for science, 40 for arts and 30 for Commerce in the country, while notching up the commendable I **rank** consistently since 2006, among colleges in Kerala.

. Students	Girls	1551
	Boys	905
	Total Students	2456
Staffs	Teaching	152
	Non-Teaching	60
	Total Staffs	212
Total Occupancy of the college		2668

Total student strength of the campus is 2456. 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. SH COLLEGE, THEVARA 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 verity 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. The degradable waste is treated in the biogas plant, the biogas generated is used in the kitchen. A state of art sewerage treatment plant is installed in the campus

Degradable Waste Generation (2018)

SACRED HEART COLLEGE, THEVARA	
Waste generated in kg per day	50.025
Waste generated in kg per Yr	1096

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 (2018)

SACRED HEART COLLEGE, THEVARA	
Non degradable Waste generated kg per day	8
Waste generated in kg per Yr	171

WASTE MINIMIZATION AND RECYCLING		
1	Does your institute generate any waste? If so, what are they?	Yes, Solid waste Canteen waste, paper, plastic, Horticulture Waste etc
2	What is the approximate amount of waste generated per day? (in Kilograms/month) (approx.)	Bio Non- Hazardous others Degradable Biodegradable
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 and biogas. 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.	Number of awareness programs through ECO Club
7	Can you achieve zero garbage in your institute? If yes, how?	Not yet achieved. Possible through waste management plan.

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	66
		Ornamental	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.	22	
	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 sequestrated 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 sequestrate 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. Details of the trees in the campus compound are given in the Table 3.18. Detailed table is included in the technical supplement.

Carbon Sequestration	
Particular	tCO_2e
Carbon sequestration SH College	7.97

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 CO_2 sequestrated in the tree
- Determining the weight of CO_2 sequestrated in the tree per year

Carbon sequestrated by each species of trees in the campus compound is given in the Table.3.19 Detailed calculation results are listed out in the tables provided in the technical supplements of 'Carbon sequestration'.

Sl No	Scientific Name	Habit
1	Acacia chundra	T
2	Aegle marmelos	T
3	Alangium salvifolium	T
4	Alstonia scholaris	T
5	Annona squamosa	T
6	Antiaris toxicaria	T
7	Aporusa lindleyana	T
8	Artocarpus altilis	T
9	Artocarpus hetrophyllus	T
10	Artocarpus hirsutus	T
11	Butea monosperma	T
12	Careya arborea	T
13	Cinnamomum zeylanicum	T
14	Citrus limon	T
15	Cocos nucifera	T
16	Couropitia guianensis	T
17	Cynometra travancorica	T
18	Diospyros buxifolia	T
19	Diospyros ebony	T
20	Elaeocarpus tuberculatus	T
21	Ficus benghalensis	T

22	Ficus racemosa	T
23	Ficus religiosa	T
24	Flacourtia montana	T
25	Garcinia gummigutta	T
26	Garcinia xanthochymus	T
27	Gliricidia sepium	T
28	Glochidion ellipticum	T
29	Holoptelia integrifolia	T
30	Hopea sp	T
31	Hopea parviflora	T
32	Humboldtia bourdillonii	T
33	Mallotus philipinensis	T
34	Mangifera indica	T
35	Meiogyne ramarawii	T
36	Michelia champaca	T
37	Mimusops elengi	T
38	Moringa oleifera	T
39	Murraya koenijii	T
40	Myristica fragrans	T
41	Neolamarkia cadamba	T
42	Pajanalia longifolia	T
43	Percea americana	T
44	Phyllanthus emblica	T
45	Pimenta dioica	T
46	Polyalthia longifolia	T
47	Pongamia pinnata	T
48	Pouteria lucuma	T
49	Psidium guajava	T
50	Punica granatum	T
51	Samania saman	T
52	Saraca asoka	T
53	Spondias pinnata	T
54	Strychnos nuxvomica	T
55	Swetinia macrophylla	T
56	Symplochos laurina	T
57	Syzygium cumini	T
58	Syzygium samarangense	T
59	Tabebua rosea	T
60	Tamarindus indicus	T
61	Tectona grandis	T
62	Terminalia arjuna	T
63	Tetrameles nudiflora	T
64	Vatica chinensis	T
65	Vatteria indica	T
66	Writia tinctoria	T

3.1.1 ENERGY

a. Electricity

The total emission of the carbon dioxide per student is 248.52 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. A renewable energy project is already implemented, ie. 250kWp solar power plant which mitigates 280.59 tCO_2e in the current year. So the effective specific carbon emission per student is 38.02 kg of CO_2 per year only

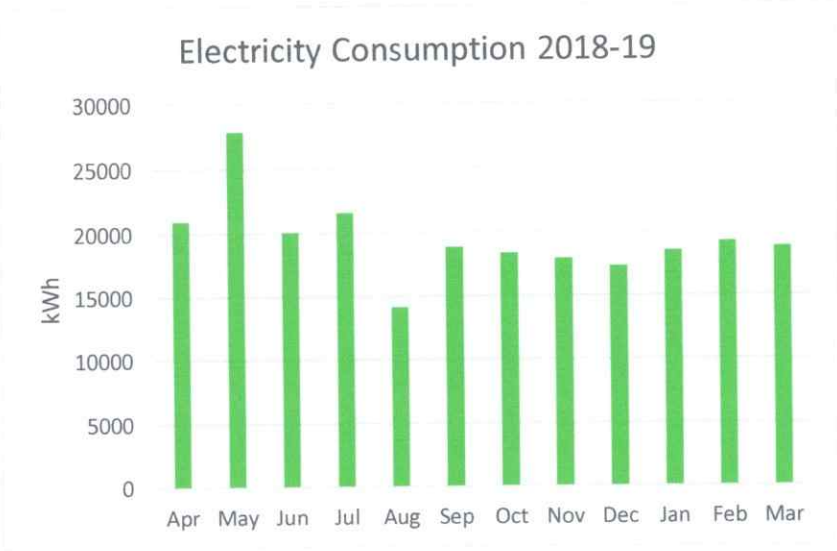
This can be achieved in many ways but, every alternate plan must be in such a way that, it must fulfill the actual purpose of each activity that is considered.

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

Base Line Energy Data (2018-19)(Annual)		
SACRED HEART COLLEGE, THEVARA		
1	Annual Electricity Consumption (kWh)	215242
2	Annual Solar Generation (kWh)	13447
3	Annual Diesel Consumption (kg)	122
4	Annual Biogas consumption (m3)	1500
5	Annual Electricity Cost (Lakhs Rs)	18.67
6	Annual Diesel Cost (Lakhs Rs)	0.11
7	Total Annual Energy Cost (Lakhs Rs)	18.78
8	Rs/Kwh (avg) Electricity	**7.89**



During the energy audit filed studies, 224 T-12 lamps were identified, which is considered as inefficient. 13 CFLs and 7 LED tubes were found during the audit. The detailed energy efficiency projects are given in the respective chapters of this report.

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, SH COLLEGE, THEVARA 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 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

Biogas plants and solar power plants are 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.

Greenhouse Gas Mitigation through Major Energy Efficiency Projects						
Sl No	Projects	Energy saved(Yearly)		Sustainability (Years)	First year ton of CO2 mitigated	Expected Tons of CO2 mitigated through out life cycle
		(kWh)	MWh	Years		
1	Energy Saving in Lighting by replacing existing 220 No's T12 Lamps to 18W LED Tube	13620	13.62	10	9.94	99.42
2	Energy Saving in Lighting by replacing existing 43 No's T8 Lamps to 18W LED Tube	2384	2.38	10	1.74	17.40
3	Energy Saving in Lighting by replacing existing 122 No's CFLs to 9W LED Tube	1004	1.00	10	0.73	7.33
4	Energy Saving by replacing existing 382 No's in-efficient ceiling fans with Energy Efficient Five star fans	15402	15.40	10	11.24	112.44
	Total	32410	32	10	24	237

OTTOTRACTIONS- ENERGY AUDIT						
SACRED HEART COLLEGE, THEVARA						
Greenhouse Gas Mitigation through Renewable Energy Projects						
Sl No	Projects	Energy saved(Yearly)		Sustainability (Years)	First year ton of CO2 mitigated	Expected Tons of CO2 mitigated through out life cycle
		(kWh)	MWh	Years		
1	Installation of 120 kW Solar Power Plant	153300	153.30	10	111.91	1119.09
	Total	153300	153	10	112	1119

Water Conservation Activities	
List four uses of water in your institute	Basic use of water in campus: 1. Drinking – 2. Gardening – STP treated water 3. Kitchen and Toilets – 4. Others –
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. Planning to implement more pits strategically for RWH pits Water conservation are in place. open wells and their recharge, ground water re-charge through re-charge pits, Rain Water Harvesting by using ferrocement tank, open tanks.
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 litres of water have been used.	No logbooks are available
Does your institute harvest rain water?	Yes
Is there any water recycling system?	Yes (Rainwater recharging)

General Environmental Awareness Questioner	
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 (Written Policies for Environment, Waste and Energy Management)
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	Yes
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

Best Practices and Initiatives	
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 SGT campus on alternate day by Municipal Corporation.	
Adoption of Village	Yes
CSR	
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 on site and where the 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 environmentally friendly. The recommendations are also mentioned with observations for SH COLLEGE, THEVARA team to initiate actions.

Carbon Foot Print (2018)			
Sl. No.	Particulars	Consumption	Tonne of CO_2e
1	Annual Electricity Consumption (kWh)	215242	176.50
2	Annual LPG Consumption in kg	123	0.18
3	Annual Diesel Consumption (kg)	122	0.39
4	Annual Diesel Consumption (kg)(Transport)	10009	31.03
5	Annual Biogas Consumption in m^3	1500	2.10
6	Annual Solar Generation kWh	13447	11.03
7	Food Waste in kg/yr.	1096	0.69
8	Paper Waste in kg/yr	171	0.10
9	Plastic Waste in kg/yr	105	0.04
6	Total Carbon Foot Print tCO_2e/yr		222.05

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 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

INTERNAL QUALITY ASSURANCE CELL

Heartian

ENVIRONMENT AND ENERGY POLICY

2018

Reviewed on 2018

Dr. Johson Xavier (Prasant) Palacakppillily CMI

Principal

Thevara, India

Sacred Heart College (Autonomous) Thevara

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VISION, MISSION AND GRADUATE ATTRIBUTES

VISION

Fashioning of an enlightened society founded on a relentless pursuit of excellence, a secular outlook on life, a thirst for moral values as well as an unflinching faith in God.

MISSION

"To provide an environment

- that facilitates the holistic development of the individual
- that enables the students to play a vital role in the nation building process and contribute to the progress of humanity.
- that disseminates knowledge even beyond the academia.
- that instils in the students, a feel for frontier disciplines and cultivates a concern for the environment.

by setting lofty standards in the ever-evolving teacher-learner interface."

GRADUATE ATTRIBUTES (HEARTIAN DNA)

Faith in God and faith in oneself

Physical and mental fitness

Self-awareness and emotional intelligence

Intercultural and ethical competency evidenced through a readiness to serve humanity (SH) & planet

Critical thinking, problem solving and research aptitude

Deep discipline knowledge

Readiness to take the first step (leadership)

Teamwork and communication skills (career readiness)

INTRODUCTION

Sacred Heart's Environment and energy policy stems from the motto, vision and mission statements of the college and as an institution excellence, it is our responsibility to creatively respond to the continuing deterioration of ecosystems on which we depend for our well-being as a society. The integration of safer ecosystems and environmental protection, efforts to meet the basic needs of human beings and to provide a better quality of life for all, and the integration of environmental and developmental concerns will lead to a safer and more prosperous future. Sacred Heart with its innovative initiatives and excellent leadership in higher learning is committed to society to assume a major role in environment protection and climate change moderation. Sacred Heart adapts itself to the *Swachh Bharath Abhiyan*, the most significant campaign by the Government of India, through its active participation in generating power through renewable energy sources. With nearly 304 million Indians without access to electricity, and about 500 million people, still dependent on solid bio-mass for cooking, it may be acknowledged that the country has to still go a long way on securing its energy security objective. While India strives to achieve a double-digit growth rate in its national income, making clean energy available to all of its citizens, ought to be included as a key component of the poverty alleviation programmes. Sacred Heart College, with its capacity as an autonomous institution has introduced serval innovative ideas for green initiatives, energy efficiency and sustainability in the campus.

POLICY STATEMENT

The protection of environment is a global issue and it is not an isolated problem of any area or nation. This has to be addressed collectively by everyone in society as the world is such small unit and everything is interconnected irreversible. Everything affects everyone and a nuclear test carried out in one part of the world will be carried by winds to any other part of the world. Human survival depends not only on human well-being but also on the well-being and protection of the environment. Man's scientific and technological progress has deposited him with far greater power over nature, which has resulted in the unthinking use of power and the infinite penetration of nature and environment. There is a great youth revolution is taking place in Europe under the leadership of the young Greta Tunberg, while the world nations have pledged themselves to the sustainable development goals, with very pertinent areas like sustainable cities and communities (Goal No. 11), responsible consumption and production

(Goal No. 12), Climate Action (Goal No. 13), life below water (Goal No. 14), life on land (Goal No. 15) and partnership for the goals (goal 17), expected to be attained by 2030.

Government of India has formulated National Mission for Sustainable Agriculture (NMSA) for promoting sustainable agriculture through a series of healthy practises such as; 'Improved crop seeds, 'Water Use Efficiency', 'Pest Management', 'Improved Farm Practices', shifting to environmental friendly technologies, adoption of energy efficient equipment, conservation of natural resources and integrated farming. Therefore, as a responsible higher education institution, it is our responsibility to have a policy for the protection and upliftment of sustainable development considering all the stakeholders associated with the institution.

The Environment and Energy Policy of Sacred Heart College applies to the main campus and the East campus as well as to all academic, curricular, and extracurricular activities and programs of the College. It will help us to embed efficiency and environmental awareness into our every-day activities, such as minimising the impact on the environment and cutting pollution and waste by using energy efficiency measures; for example, switching off lights, minimising waste, pooling of vehicles, plastic free campus, using carry bags, promotion of bicycles, organic farming and production of consumable products etc. In 2018, College received the Biodiversity Award from the Government of Kerala for its efforts in the field of environmental protection and organic farming. The East Campus of the College is designed in what is known as the Green Building, with innovative architectural features to have an eco-friendly campus. The reorganization of existing institutional arrangements is a necessity of the time, and requires a strong government policy perspective in terms of environmental aspects.

ENVIRONMENT AND ENERGY USAGE PRINCIPLES FOR SACRED HEART

College Environment Policy - SH College has a strong environment policy and it always put effort in conveying the same to the students, local people and other stakeholders. The policy goes thus: Sacred Heart College is committed to protection and promotion of life on the planet. It believes in 'go-green and grow green'. As a matter of practice, it shall;

- Seek to spread and deepen awareness on environment issues and an environment friendly life-style among the academic community and neighbourhood community ☒

- Pay special attention to minimizing waste, especially plastic waste that doesn't degrade, with 'zero waste'. This is an ideal management properly implementing with advance planning. Therefore, we take utmost care while conducting of the activities/programmes/celebrations to avoid or minimize the use of disposables and flex banners. ☒

- Introduced and practiced recycling the material that doesn't degrade, at the student level through Entrepreneurship Development Cell, and at the college level, by establishing a paper recycling unit in due course ☒

- Tap renewable energy resources including solar energy, rain water harvesting etc. as much as possible. ☒

- Protect and promote diversity, especially of indigenous and coastal flora and fauna and their documentation. ☒

- Promote organic vegetable and food production by students and local community with the involvement of students and faculty. ☒

Heartians pledge to fulfil its commitment to the environment through the following levels of actions:

1. Achieving transparency about our environment and energy impact, giving importance to our own carbon footprint, through institutional reporting.
2. Integrating energy and environmental considerations into the design of all new infrastructural facilities at Sacred Heart.
3. Improving operational efficiency and minimising impact on the environment.
4. improving resource efficiency in operations, especially for key resources such as energy and water.
5. Adopt a sustainable water conservation and water management philosophy.
6. Strive towards a GREEN CAMPUS
7. Continuous monitoring and reviewing of objectives to achieve continual improvement in environmental and climate performance.
8. Preserve and enhance biodiversity in both campuses.
9. Educate the administrators, students, teaching and staff with seminars and sessions on environment sustainability

10. Focussing on renewable energy systems like solar energy and wind energy.
11. Focussing on increasing water efficiency and sustainable waste management.
12. Funding for research and Development on environmental aspects, challenges, issues and solutions.
13. Foster innovation through the use of innovative technologies to minimise atmospheric emission and energy consumption.
14. Engage in dialogue with the stakeholders, co-operate with universities and industry, and actively work with national and international organizations in the areas of environment, energy efficiency and sustainable development.
15. Review environmental policy and systems to ensure continued applicability and relevance of its purpose.
16. support various local communities to engage in environmental friendly initiatives and practices.
17. Efforts must be taken to improve environmental knowledge and awareness among public and student and teaching community to gain support, consensus, and commitment of individuals in the identification, preparation, implementation, monitoring and evaluation of environmental programmes.
18. This policy will be communicated to the administrators, students, teaching and non-teaching staff via the Sacred Heart mail system. It will be made available to the public through the College website (https://www.shcollege.ac.in)
19. Gobar Gas plant - The management residence kitchen energy needs are being managed by a huge gobar gas plant. Water boiling in the college canteen is entirely done on energy generated from bio-gas from kitchen waste.
20. Car Pooling - Two teams of staff members practice carpooling so as to save energy and save money.

GREEN CAMPUS GOALS

- Improving the carbon efficiency by 50% by 2025, compared to 2019.
- Reduce local air pollution emissions by 2025 by promoting the use of public transportation, and
- Banning the entry of vehicles in campus.
- Promote pooling of vehicles by teachers
- Celebrate NO VECHICLE DAY once in a month

- Promotion of Khadi material in the campus
- Complying with the applicable international, regional and national environmental regulations, as well as legal requirements regarding energy consumption and energy efficiency.
- Awards and recognition to students and teachers who use bicycle regularly.
- Taking additional measures by reducing energy consumption
- Considering environmental aspects and energy efficiency in all major investment and procurement decisions- adopt a green procurement philosophy
- incorporate environment education through curricular and extracurricular activities.
- Follow the government measures like GREEN PROTOCOL and beyond in all the programmes of the college.
- SH Centre for Organic Farming Ornithology and Biodiversity (SHCOOB)- Monitor and guide the activities at extension centre at Arayankav. Development of extension center is to promote bio-diversity, organic farming, ornithology, and community environment education.
- Promotion of Extension Centre Ecotourism Habitat at Araynkavu
- Cooperate and collaborate with likeminded regional, national and international organisations.
- Teach students and community regarding various ecological problems facing the Earth.
- To develop expertise in the fields of water quality management, water conservation, environment audit, bio-diversity (flora-fauna) assessment and documentation,
- Create an incentive system for teachers and students to implement sustainable use of eco-friendly practices in the home and personal lifestyle.

CONCLUSION

Until recently, environmental issues have been ignored by all and no one seems to be concerned. Decision makers at all levels were worried about profit and whose main objective were generally focused on profit maximization. At present, people started realizing that the environmental system is a key to development and that it has a finite capacity to provide for human needs. At Sacred Heart, ample concern is given to the environment as the institution

aims towards sustainability. New approaches and a holistic policy is needed to address the present-day challenges involving all relevant partners and sectors. Heartians shall strive to fulfil our obligations and commitments to the environment as a truly responsible global citizen. The policy will be reviewed in the second week of July every year by the designated committee. Green Campus provides an opportunity to create a clean environment in the campus and surrounding areas. Sacred Heart College takes the initiative to make organic products such as jam, squash, processed rice and rice flour to serve as role model for community and also to support and strengthen the agriculture. This document is an attempt to lay the basis for the development and use of health and environmental indicators in sustainable development planning. As an institution of higher learning, Sacred Heart can play a key role to harmonise health, environment and development process more effectively in society.

SACRED HEART COLLEGE
Autonomous

Heartian

Waste Management Policy

Sacred Heart College

(Autonomous)

Thevara, kochi 682 013

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Introduction

As Sacred Heart College has been making very distinctive contributions in the field of environment and sustainability, it shall pay considerable attention to minimize the production of waste on the campus. This policy envisages to guarantying the moral, social and legal responsibilities of the College in creating an environment-friendly and sustainable world devoid of waste and exploitation of nature. This policy is a guidance document to the faculty, staff and students to behave responsibly in the production of waste, waste segregation, storage, handling, transport and disposal.

The Policy vision

The policy envisions a community which is acutely conscious of the anthropogenic condition of the world and therefore strives to create an ecologically healthy, prospering and resource efficient community, where waste is considerably reduced, recycled, reused and disposed of using an environment friendly safe method.

Policy objectives

- Create consciousness among faculty and students about the ways in which waste is generated and the means by which they can reduce waste generation and manage the waste they produce.
- Orienting them to adopt appropriate technologies for processing and managing solid, liquid and e-waste.
- Give appropriate training to segregate hazardous and non-hazardous waste and dispose of them using appropriate method without creating further environmental pollution.
- Follow the five "R" principle of reduce, reuse, recycle, refuse and regenerate
- Maintain the campus plastic free

Solid waste management:

Students shall be instructed to avoid generating waste. Solid waste shall be isolated and deposited in the YELLOW bins dedicated for the purpose on all floors. Food waste shall be used to feed to poultry on the campus, if more in quantity, be supplied to piggery. The ongoing project by Zoology department shall focus on training in bio-waste management using VERMICOMPOSTING technology. A biogas plant is installed to manage bio-waste from canteen and the generated gas is used in the canteen. There shall have separate bins for degradable and non-degradable items in each class room; red painted for plastic and related stuff, and green ones for paper. Waste from various rooms shall be collected in the waste segregation centre and scrutinized for segregation. The segregated waste can be sold to the MoU signed agency for recycling. Waste paper shall be used for the startup venture of PAPER PENS (PERPEN). Precaution shall be taken not to bring disposables such as PET bottles, Thermocol, paper plates or cups to the campus. Steel glasses and plates stored by the SDO and the NSS units shall be used during camps. An incinerator shall be installed in the campus to burn garbage.

Liquid waste management:

Liquid waste generated in the wash areas (bath rooms, toilets), labs, canteen and snack area (Foodies' Corner) shall be passed through drains to absorb into the earth midway through the college ground. Canteen wastewater shall be managed through sedimentation pits which are cleared periodically of the waste and the rest of the water shall pass into the traditional drain.

E-waste management:

The agreement between M/s Aspire Greens and the college shall take care of the safe disposal of e-waste. The following items are identified by the agency as e-waste and agency shall dispose of this waste safely.

Camera	CPU	CRT Monitor
Hard Disk	Mother Board	LCD Monitor
Mobile	Mouse	N Computing Terminals
Network Rack	Network Switches	Photo Copier
Printer	Scanner	SMPS
UPS	Cable Box	Fax Machines

Laptops	Server computer	Pump
PCBs	Inverters	Bio Medical Equipment
Refrigerator	Compressor	Lead Acid Batteries
Copper Cables	Electrical Switches	Miscellaneous E Waste

Waste recycling system:

The following measures shall be in place for waste recycling:

1. All one-side used papers shall be utilized for routine printing activities.
2. Used papers shall be put to use for making paper pens as a startup venture
3. Saleable materials like paper bits, plastic waste including accumulated PET bottles etc shall regularly be sold to recycling agents thus generating some income for outreach activities
4. Ballpoint pens shall be put to REUSE by inserting new REFIL and sold at cheaper rate through HONESTY SHOP.
5. Recycled water from the treatment plant shall be used in the Hostel.

Hazardous Chemical Waste Management:

Use of hazardous liquid chemicals generating hazardous fumes shall be avoided using fume hoods installed in the laboratories. Hazardous waste generated shall be handed over periodically to the Kochi Corporation treatment yards.

Clean Campus Committee of the College

Dr. Johnson X. Palackappillil	Principal (Chairman)
Dr. Sebastian John	Bursar
Dr. Johnson K M	IQAC Coordiantor
Dr. Didimose K V	Dean of Student Affairs
Mr. Sandeep Sunny	Faculty- Physical Education
Ms. Ragam P. M.	NSS Programme Officer
Dr. Joseph Varghese	NSS Programme Officer
Mr. Abin Ambily	Student Development Officer
Ms. Rakhi Menon	Student Counsellor
Mr. P. M. Joseph	Work Supervisor

Student Representatives (Three from Student Council)

INTERNAL QUALITY ASSURANCE CELL

Water Conservation Policy 2016

Revised in 2018

Sacred Heart College
(Autonomous)
Thevara

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1. VISION, MISSION, GRADUATE ATTRIBUTES

VISION

Fashioning of an enlightened society founded on a relentless pursuit of excellence, a secular outlook on life, a thirst for moral values as well as an unflinching faith in God.

MISSION

To provide an environment

- that facilitates the holistic development of the individual
- that enables the students to play a vital role in the nation building process and contribute to the progress of humanity.
- that disseminates knowledge even beyond the academia.
- that instils in the students, a feel for frontier disciplines and cultivates a concern for the environment.

by setting lofty standards in the ever-evolving teacher-learner interface.

GRADUATE ATTRIBUTES (HEARTIAN DNA)

Faith in God and faith in oneself

Physical and mental fitness

Self-awareness and emotional intelligence

Intercultural and ethical competency evidenced through a readiness to serve humanity(SH)

&planet

Critical thinking, problem solving and research aptitude

Deep discipline knowledge

Readiness to take the first step (leadership)

Teamwork and communication skills (career readiness)

2. INTRODUCTION

Water scarcity is a pressing challenge both for urban and rural community in India. However, the urban community very specifically face increasing challenges to their water supply because of complex interactions like, drought, high-rise of infrastructure, population growth, lack of planning, conversion of wetland, and other natural and human factors. The prospect of climatic change adds to the difficulty of planning sustainable water supply systems, on account of both the increasing uncertainty about future supply and demand for water and of predicted reductions in water availability. As a result, Sacred Heart College, with its credentials in academic and its voluntary involvement in sustainable development programmes have enacted several policies and resolutions to create a wide-ranging set of water conservation requirements, as well as water rate structures designed to conserve water. The purpose of the revision of Sacred Heart College Water Conservation Policy 2018 is to provide the college and the local community with the means to reduce water demands by making them aware with prescribed water conservation policy in the personal and community level for water conservation.

3. WATER CONSERVATION POLICY GOALS

The primary goal of Sacred Heart College water conservation policy is to achieve water neutrality by 2025. The college is implementing water-efficient fixtures in its new constructions in campuses, ensuring 100% treatment and recycling of sewage and rainwater harvesting. East campus sewage will be treated using state of the art technologies and will be recycled for use in flush tanks and irrigation. Student and staff engagement play a major role in our water sustainability strategy. Reducing water consumption and protecting water quality shall be the key objectives of sustainable policy of Sacred Heart College. The College views water from the three inter-related dimensions of Efficient Conservation, Responsible Consumption and Restoring and Retaining surface and groundwater.

One critical issue of efficient water conservation is the salty ground water in many areas of the College and the management has implemented standard metering infrastructure and procedures across the campuses. IQAC has made an assessment and review and separately metred the water usage and identified the areas in which water usage was greatest and supported the management to prioritize those areas for improvements and maintenance. College has also

integrated rain water harvesting into the consumption side of the campus water cycle. IQAC takes special attention to improve water governance by building awareness among staff, students and involvement of water plumbers in the campus. For e.g. Water is used in the college in every conceivable way—for departments labs, individual purpose and agricultural and cleanliness needs. Teaching, non-teaching and student community have no idea of how much water is being used, or at what cost. It was the consistent effort of the management and the IQAC that made a drastic difference in the implementation of efficient methods at various sites.

4. INITIATIVES BY SACRED HEART COLLEGE

Sacred Heart College is working towards making the facilities more and more water sustainable. This has been achieved with the use of water efficient fixtures, waste water treatment technologies, rain water harvesting and smart metering for monitoring.

1. Ensuring improvement of the water and water dependent natural resources at surrounding areas in the campus.
2. Installation of Aerators in all new wash basins across the campuses. Aerators provide a constant flow rate of 0.5GPM through variable pressure gauge for optimizing water use to a great extent.
3. Flow regulator taps in urinals: Installation of flow regulator taps in the urinal system in the toilet block at East Campus, Fr. Archangel hall and first floor at main block.
4. Sewage Treatment Plant: Sewage Treatment Plant at East Campus will become functional by 2021 in conformation with the parameters specified by the local pollution control board.
5. Water conservation storages: With the support of RUSA, the college management is working hard to establish a rain water harvesting system with a capacity of 10,00,000 litres at Main Campus and East Campus. The system will become functional by 2021.
6. Ferro Cement Tanks: College also owns one Ferro cement tank of about 30,000 litres capacity for water harvesting.
7. Surface water conservation through ponds and wells: College campus is blessed with three natural wells and supplementary tanks. We have a 20,000 litre supplementary tank for fish breeding, one water percolation pit of 10 feet depth for water recharging.

5. PROVISIONS

Sacred Heart Promotes water conservation and water reuse efficiency measures as essential elements of sound water resource management. College encourages all its stakeholders to support policies and programmes for water conservation that would achieve:

1. A sustainable balance between demand, management and reduce waste through accurate accounting of water volume.
2. Water conservation education to all the stakeholders of Sacred Heart College
3. Research and implementation of practices that promote efficient use of water.
4. Coordination between water planning and other aspects of facility planning and management in association with local government body

6. GOALS AND PLANS

1. Maximize water use efficiency and minimize wastage of water.
2. All existing buildings to be used for water conservation and rain water harvesting.
3. Promote investment in and maintenance of efficient water infrastructure and green infrastructure in all future development plans.
4. Promote appropriate innovative water and wastewater management technologies and services.
5. Provide incentives to students and teachers for efficient water use and conservation.
6. Provide training on the water conservation measures adopted by the college to all the students, staff and other stakeholders of the college and nearby community.
7. Ensure awareness about the water conservation policy of the college among all the stakeholders.
8. Establish waste treatment and recycling centres.
9. Create awareness about the cost-effectiveness of water conservation projects among students and local community.
10. Consistency in levels of project implementation at Sacred Heart College.
11. Improve water quality. For example, create awareness about garbage disposals among public and take the leadership to make Pandit Karuppan Road neat and clean.

12. Recycle non-sewage and greywater for on-site use (such as toilet flushing, landscape irrigation, and more generally, consider the water quality requirements of each water use)
13. Build relationships between environmental, societal leaders and policy makers to identify obstacles and opportunities to increase the role of conservation and efficiency in making urban water supply systems sustainable.
14. Community programmes: Organise various outreach programmes under the leadership of NSS, Boomithrasena, Agriculture Club and other student bodies.
15. Monitor and collect information related to the water bodies at Thevara.
16. Encourage research, development and implementation of water conservation techniques in relation to the ecological needs and responses.
17. Increase understanding of water and its movement including groundwater and its interaction with surface water, and the effects of climate change on water resources among student and teaching community.
18. Inform, educate and increase awareness regarding the importance of water to life, and the need for conservation and efficient use of water.
19. Protect the lakes and rivers and the land surrounding Sacred Heart.
20. SH Centre for Organic Farming Ornithology and Biodiversity (SHCOOB)- Monitor and guide the activities at extension centre at Arayankav. This has been established to protect many species at risk and restoring organic farming among the villagers at Arayankvu.
21. SH College Lake View Protection Action Plan was established in 2017 to safeguard the lake at the backyard of the college. Student volunteers clean the river banks of the lake every week under the leadership of various clubs.

7. CONCLUSION

Efficient water storage can be a viable solution to water conservation. This means that the College should take serious effort to protect the surrounding environment and available water resources. Regardless, as an institution of higher learning, Sacred Heart College shall have a moral responsibility to promote and propagate the message among the academic community and society as well. Over the past few years, the College has undertaking a number of initiatives to utilize water more efficiently and effectively within the campus. Sacred Heart, being and urban institute, believes that it has a major role to play among the increasingly stressed urban

population. Prevention of the degradation of lakes, water bodies and land shall be a priority of the College. As a centre of excellence in academics, it shall provide alternative ways and support to the policy makers with practical alternative systems for the benefit of society. This includes awareness campaign for the protection of lakes and land, study on climatic change, reaching out to the public through water-testing, and water literacy programmes, soil testing etc. Understanding relationships between environmental and societal factors and academia's support for water conservation measures can help planners and policy makers to identify obstacles and opportunities to increase the role of conservation and efficiency in making urban water supply systems sustainable. Policy plays a very important role in natural resource management as it lays out a government framework for guiding long-term decisions, and evolves in the light of healthy interactions between academia and administrative leadership.

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Principal

2018
BIODIVERSITY AWARD

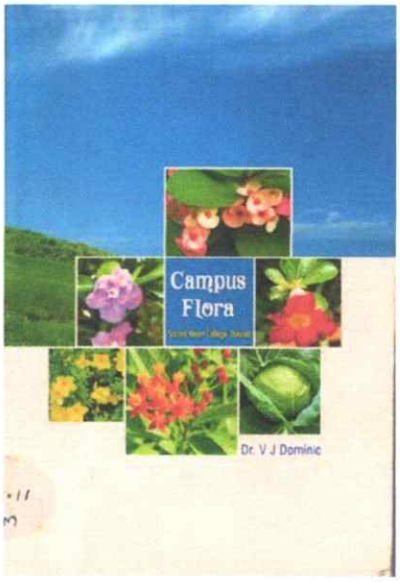
1. INTRODUCTION

1.1. Sacred Heart College - a biodiversity profile

Sacred Heart College (established in 1944) a college with potential for excellence (CPE) under UGC since 2004 and re accredited at A level till 2020 is located on scenic banks of the backwaters of Vempanadu. It has been following a green agenda for more than a decade now. Its earlier efforts in this regard fetched the '*pala thulli puraskaram*' way back in 2009. Its green motto has been: 'go green, grow green'.

An environment friendly & bio-diversity rich Vision – Mission and Emblem

The College vision speaks about 'cultivating a concern for the environment' and its emblem has a section with the river (of wisdom) flowing amidst greenery of trees of the West and the East. According to 2010 campus bio-diversity census, it had 500 plants identified (Dominic V.J. Campus Flora, 2010).



1.2. College Environment Policy - It is one of the few colleges having an environment policy of its own and the first of its kind in the state to do so. The policy goes thus:

Sacred Heart College is committed to protection and promotion of life on the planet. It believes in 'go-green and grow green'. As a matter of practice, it shall,

- Seek to spread and deepen awareness on environment issues and an environment friendly life-style among the academic community and neighborhood community
- Pay special attention to minimizing waste, with 'zero waste' as the ideal, managing it properly with advance planning of this aspect of our activities/programmes/celebrations, and avoiding/minimizing the use of disposables and flex banners
- Introduce recycling at the student level through entrepreneurship development cell, and at the college level, by establishing a paper recycling unit in due course
- Tap renewable energy resources and introduce water recycling by 2019.
- Protect and promote diversity, especially of indigenous and coastal flora and fauna and their documentation.
- promote organic vegetable and food production on and off-campus

1.3. Organisational Framework – The green policy of the college is implemented through the various fora existing on the campus, viz., Primrose Nature Club, ENCON energy club – basically focusing on energy related issues, Bhoomitrasena – with focus on water and soil conservation, Tourism club – promoting heritage preservation and responsible tourism, Bird Club, NSS, NCC, HEAL(Heartian Extended Arm for Life) – the extension wing of the college, Women's Cell - SWASTI, Jesus Youth and the Department Associations, esp. of Botany & Zoology

2. Status of Biodiversity

According to 2010 campus bio-diversity census, it had 500 plants identified in the campus (Dominic V.J., 2010). The college also developed a biodiversity registry of its campus.

College took an effort to add trees and plants to the existing collections. In the last 5 years college has added the following items to its collections.

Live collections of 21 spice varieties like, Cambodge, Tamarind, Clove, Cinnamon, Curry Leaf Plant, Black Pepper, Chilly, Ginger, Turmeric, Pepper mint, Cardamom, Kokam, Punar Puli, Vanila, Basil, Corriander, Thippali, Chittaratha

Dried collection of 21spices

Cardamom, Pepper, Chillies, Ginger, Turmeric, Coriander, Cumin, Fennel, Fenugreek, Mustard, Nutmeg, Mace, Garlic, Staranise, Vanilla, All spice, Tamarind, Cambodge, Cinnamom, Sweet flag, Greater galangal

Dried collection of 20 rice varieties

Collection 7 new coconut varieties like Chowghat Orange Dwarf (COD), Chowghat Green Dwarf (CGD), Lakshadweep tall etc.

Collection of 10 Ficus varieties

College has a few bonsai tree exhibits.

Collection of indigenous trees (potted) 20

College has a good number of Palm varieties like

- *Roystonea regia* (Royal palm)
- *Wodyetia bifurcate* (foxtail palm)
- *Hyophorbe indica* (champagne palm)
- *Cyrtostachys renda* (red palm)
- *Corypha umbraculifera* (Talipot palm)
- *Areca catechu* (Areca palm)
- *Cocos nucifera* (Coconut palm)
- *Bismark palm*
- *Pigmy date palm*
- *Bottle pam*

Bamboo varieties

1. *Bambusa bambos* (Thorny bamboo)
2. *Bambusa vulgaris* (Yello bamboo)
3. *Bambusa tuldoides* (Buddha's belly bamboo)

–budha bamboo, black bamboo, giant bamboo (Paramula), lati bamboo, creeper bamboo

Fish varieties – The aquaculture departments has various varieties of ornamental fishes like Gold fish, Tetra, Barbs, Koi Carp, Gourami, Angel Fish, Miss Kerala, Different varieties of Guppy, Molly, Platy, Fighter, Sword Tail etc. College also has three aquariums to exhibit marine fish varieties.

The **zoology museum**, with over 3000 specimens collected from various parts of the world, is one of the invaluable assets of the college. Established in 1952, it is the largest and the most spectacular one of its kind in Kerala

Arachnology collection – the Arachnology wing of the college has a rare collection of more than 1000 specimen of spiders.

Botany Herbarium has a collection of 2000 specimens in the botany museum

4. Promoting Food crop biodiversity

4.1. Wet land farming – Thottara Puncha It led the paddy farming activity in the college owned farm at Arayankavu, which has led to the revival of organic paddy cultivation in Thottara Puncha. 3.5 acres were cleared and almost 400 students took turns in clearing, sowing, planting and weeding the farm. The species that is being cultivated is IR5 rice variety. The process is also part of learning for the students. During this year 2.5 tons of rice were produced.

4.2. Upland farming - A plot of 10 cents on the campus was cultivated during the rainy season with active support from NSS volunteers and the members of Agriculture club.

4.3. One cent farming

The College has initiated a novel agriculture practice, ONE CENT FARMING; in which the students are encouraged to cultivate various vegetable crops in a limited space. Two such models were developed on the terrace and two of them were installed adjacent to the college ground. The once cent plot contains several vegetable crops such as **tubers** (Tapioca, sweet potato, dioscorea, colocasia, amorphophalus etc.) **leafy vegetables** (Chuvanna cheera, pacha cheera, sambar cheera, velicheera, agaththicheera, marakkeera, vallicheera, chayamansa), **gourds** (cumber, bitter gourd, snake gourd, ash gourd etc.), other vegetables like ladies finger, brinjal, chilly varieties, coriander leaves, mint, tomato, citrus, ivy guard, etc. One plot was dedicated to '**pulses**' and it contains five varieties of pulses (amara, tuvara, kuttipayar, french beans, meter payar). The pulses yielded almost a quintal. It had a fence of 'tuvar' dal. The pulses plot was executed with the active support of Dr. Fr. Joseph & Fr. Sabu of English department. Total yield of pulses was more than 100 kg during last year.

4.4. Terrace farming

The college has two terrace farming models in which vegetable varieties and tuber varieties are cultivated.

4.5. Mushroom Cultivation : The college has a small mushroom cultivation unit run by Botany students.

5. Centre for Organic Farming, Bio-diversity and Ornithology - Arayankavu

The college initiated a centre for Organic farming, biodiversity and ornithology at Arayankavu thottarapuncha. The objectives of the centre are to spread of natural farming practices in public, conservation of biodiversity and a centre for bird watching.

6. Partnerships

6.1. **Local Self Government** – Divisions 58, 59 - College has always maintained a link with local self-government especially with divisions 58 and 59 of Corporation of Kochi. This comes under the HEAL (Heartian Extended Arm for Life) project of SH extension activities. The key themes under this are SAFE, GREEN, CLEAN Thevara which is aligning with the Swacch Bharat campaign. The college is trying to develop a biopark near the Highway at Santhinagar Junction in association with the local self-government.

6.2.**Spices Board** – *Sugandhavadi* - The 50 cent spices garden introduced with partnership of SPICES BOARD was developed with active involvement of Botany department. The species available are: Cambodge, Tamarind, Clove, Cinnamon, Pomegranate, Curry leaf, Pepper, Bush Pepper, Chilly, Ginger, Turmeric, Cardamom, Nutmeg,Coriander, Vanilla, Peper long, Basil, Allspice, Kokkam, Greater Galanga.

6.3. **Organic Kerala Charitable Trust** - College is a partner and member of the Organic Kerala charitable trust, with the Principal as its Chairman and a few other faculty members as members. The partnership has led to a vibrant website with rich input on organic vegetable farming; a pamphlet, a document on organic farming and active campaign on Organic Farming on one cent plots with technical assistance.

The annual exhibition organised at Rajendramaidan during April 7 to 11 was with the active participation of the College, with the Principal in the lead.

This year, an agro clinic, krishi nattarivu pathana kendram was started by the collaborative efforts by SH College and Orgnaic Kerala Charitable Trust.

6.4. **KSCSTE** - With the support of KSCSTE, College could celebrate Environment Day, Ozone Day, Wetlands Day and the year of pulses in a meaningful manner.

6.5. **RADIO MANGO PROGRAMME** was launched at the college to inspire youngsters to take up localities for cleaning up and greening by clicking snaps depicting the transformation of the locality.

6.6. Observation of important days related to environment: Environment Day, Earth Day, Science Day, Ozone Day, Ocean Day, Wetlands Day, Wildlife week, World Water Day, World Sparrow Day etc. are observed in the campus. One of the outcomes of such celebrations is that a collection of excellent posters is obtained, which is digitalised and made available for future use.

6.7. In association with **Kerala Forest Department**, the college has organized an invited talk on 'Fight against Illegal Trade in Wildlife' on ..... and observed World Tiger Day on 28th July, 2017.

Fight against Illegal Trade in Wildlife

6.9. **WTI** - The international Whale Shark Day was observed in association with Wildlife Trust of India on 30th August, 2017.

Campaign to save whale sharks launched

TIMES NEWS NETWORK

Kochi: On the occasion of international Whale Shark Day, Wildlife Trust of India (WTI) and Cochin Shipyard Ltd (CSL) announced the launch of a massive awareness campaign targeting coastal communities at an event held at Sacred Hearts College, Thevara, on Wednesday. The campaign aims at securing a safer future for whale sharks off the coasts of Kerala and Lakshadweep.

The campaign to conserve whale shark was initiated in Gujarat in 2004. Welcoming the gathering, WTI senior advisor BC Choudhury said the launch of the project in Kerala is a significant collaborative conservation effort. The event began with a rally by students of the Sacred Heart Senior Secondary School. The schoolchildren were excited to see the 40-feet-long life-size inflatable whale shark that had been placed in the college's basketball court. The event was inaugurated by mayor Soumini Jain. "We are happy that WTI's Gujarat project, which was the first-of-its-kind in India, has now made its first expansion to the Kerala coast," she said.

WTI CEO Vivek Menon, delivering the keynote address, said whale sharks, which are endangered in the tropical seas are important indicators of ocean health. "We have had great success with our community engagement model in the conservation of whale sharks off the coast of Gujarat and we are pleased to now formally extend this model to Kerala," he said. The second-largest congregation of whale sharks in India are found off the shores of Kerala and Lakshadweep.

Sajan John, manager and head of marine projects at WTI, said surveys to check the awareness levels and responsiveness to the campaign will be launchedshortly. "I have requested the mayor to adopt whale shark as a mascot of the city, like many cities in Gujarat, which will bring several benefits. It'd be a huge leap for the initiative if such a measure is taken," John said.

CONSERVATION RALLY: The schoolchildren were excited to see the 40-feet-long life-size inflatable whale shark that was placed in the college's basketball court

6.10. The college has a collaboration with the WOW (Wellbeing Out of Waste) and Ecorycle, the agencies working in the field of waste management. There is an ongoing tie up on the basis of which segregated waste is collected by the agency and a small income being generated by the college.

6.11. KURTC - The NSS unit **planted 50 saplings** on the **KURTC** bus stand at Thevara and have taken upon themselves the task of protecting them in collaboration with KURTC employees.

7. VARIOUS CLUBS AND FORA DEALING WITH ENVIRONMENT AND BIODIVERSITY

7.1. Primrose Nature club - Primrose Nature Club of the college has a long standing legacy as a correcting force, whenever any kind of threat to nature crops up.
It organised a **talk on 'Fight against Illegal Trade in Wildlife'** and **a workshop on 'Lifestyle and Cancer'**.

In collaboration with CNRM, Primrose nature club organized an inter college and school seminar, quiz competition and poster designing competition in connection with the world wildlife week celebration in our college on 6th October, 2016. There were two classes lead by Dr. J. Jemson and Mr. Basil Peter. There was a photo exhibition of birds by Basil Peter. Students from different schools and colleges participated in the program.

The club members in collaboration with NSS prepared ***Karkidakakanji***, an ayurvedic health food, in the ayurvedic tradition of the state, during the month of *karkidakam.*

A biodiversity survey was conducted to document the flora of the campus (list attached). A week long programme including elocution wildlife quiz, pencil drawing, water colouring were conducted during the wildlife week. The club also observed world green consumer day (March 15, 2016).

Wetland day celebrations: Oath taking and cleaning program at Thevara Ferry on February 2, 2018

On 10th of February 2018, the nature club members have conducted a field study and trekking programme at Wagamon hills. 32 students were attended the program. The major objective of the field study was to familiarize with the endemic plants of the Western Ghats. The students were studied the endemic plants such as *Osbeckia travencorica, Strobilanthes heyneanus, Vernonia comorinensis, Vernonia indica, Vernonia malabarica, Osbeckia wightiana, Medinella malabarica,* etc

7.2. Bhoomitrasena - Ozone Day - In the month of October, a series of events were organised in relation to the Ozone Day observation of the year 2016 by the college in collaboration with Kerala State Council for Science Technology and Environment (KSCSTE). Dr P. Shaiju (Scientist, Dept. of Chemical Oceanography, School of Marine Sciences, CUSAT) shared knowledge onto the students regarding the problems caused by Ozone depletion in the recent years.

In connection with World Ozone Day celebration Bhoomitrasena club in collaboration with Kerala State Council for Science, Technology and Environment (KSCSTE) organsed various programmes which include poster making competition, quiz competition, signature campaign and rally etc. on 25th and 26th of September 2017. Dr Linto Alappat (HOD, Dept. of Geology, Christ College, Irinjalakuda) inaugurated the seminar. The focal theme "Caring for All Life under the Sun" was highlighted for talks and discussions.

Environment Day: In connection with world environment day, Bhoomithrasena club organizes a seminar and different intercollegiate competitions (elocution, painting, poster quiz) based on the focal theme "connecting people to nature". The seminar was inaugurated by Dr. Shijo Joseph (Scientist E1, KFRI). The seminar was sponsored by KSCSTE.

Paper Bag Making: To highlight the importance of recycling, the BhoomitraSena Club, SH College, Thevara, organized a class on paper bag making at the food chemistry lab on 21st December 2017.The class was taken by Devika (M.A.Economics).The students utilized old newspapers and chart papers to make the bags and the class was successful in achieving its purpose.

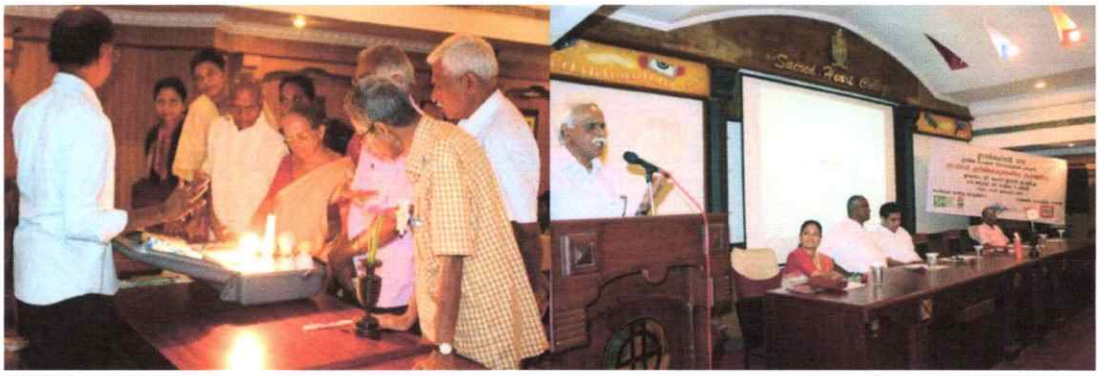
Cage Farming: The BhoomitraSena club members organized an invited talk on cage fish farming on 5th December, 2017 at Melesius Hall, SH College, Thevara. Dr.Imelda Joseph (Scientist, CMFRI) was the resource person. Inspired by the lecture, a visit to cage fish farm at Moothakunnam along with CMFRI officials Mr. Suresh and Mr. Prasad was organized on 16th December 2017. About 40 students were participated in the event.

Cage fishing

World Wetlands Day: In connection with world wetlands day, Bhoomithrasena club and EVS dept. organized a seminar and poster competition on Feb 2. "Science and technology for sustainable development"t was the focal theme. Dr. Kripa (Scientist, CMFRI) , inaugurated the seminar. Last year the club observed wetland day by organizing leccures and inter-collegeiage competitions. The event was based on the focal theme **"Wetlands for Our future"**. Poster, Elocution, Environment Quiz, Debate competitions were organised as part of the celebrations.

Wetlands for a Sustainable Urban Future

7.3. ENCON – Energy club - As part of observing National energy Conservation Day and in connection with the **'Urjakiran Programme'** (A state government initiative), the Physics Association organised an energy Conservation Rally to spread awareness on the importance and need for energy conservation. A seminar on energy conservation (14.01.2016) and an LED-making workshop (25.02.2016) were also conducted.



Dr. Roby Cherian represented SH College for 2016-17 Environmental protection and energy conservation activities and came out first in the ENCON club presentation competition held on 25th august, 2017.

ENCON Award

On national energy conservation day (Dec. 14, 2017), a rally was conducted to spread the message of energy conservation.

ദേശീയ ഊർജ ദിനാചരണത്തിന്റെ ഭാഗമായി തേവര സേക്രഡ് ഹാർട്ട് കോളജിലെ ശാസ്ത്ര വിഭാഗം വിദ്യാർഥികളും എൻസിസി നാവിക വിഭാഗം കേഡറ്റുകളും ചേർന്ന് സംഘടിപ്പിച്ച ഊർജ സംരക്ഷണ റാലി മരട് നഗരസഭാ ചെയർ പേഴ്സൺ സുനില സിബി ഫ്ളാഗ് ഓഫ് ചെയ്യുന്നു. ഡോ. സിബി മാത്യു, ജോർജുകുട്ടി ജോസഫ്, മാത്യു ജോർജ്, ഡോ. റോബി ചെറിയാൻ, പ്രഫ. അലക്സ് ഷിനു എന്നിവർ സമീപം.

Two awareness classes were organized under the Urjakiran project. In the first class, more around 100 members of the local public attended. Dr. Mathew Jose led the awareness programme. Booklets were distributed. In association with the KSEB, CFL lamps were distributed to the public. A survey and an LED making workshop were also conducted.

7.4 Tourism Club - organised National Tourism Day in January with stress on the international theme: sustainable tourism for development. As a token they honoured the staff who undertake the campus environment maintenance work. A **paper-bag** making training was given to the club members who produced sufficient number of paper bags for the college purposes

Tourism club conducted a rally for river this year to spreading awareness for protecting rivers of Kerala

Bike rally to Cheeyappara – Members of the faculty and students organized a bike rally to Cheeyappara waterfalls and cleaned the premises and spread cleanliness awareness to the visitors

7.5 Agriculture Club -

The agriculture club has 80 members. Activities of the club mostly were done in Saturdays and after the class hours with the active participation of the students. Over 200 grow bags were prepared in college terrace. Lady's finger, chilly, tomato, spinach, brinjal, pea, cabbage, cauliflower etc. were grown and vegetables sold in the Heartian harvest Shop in College. Farmers' Day on August 17th was celebrated with much enthusiasm. As part of it, charts on farming has displayed in the college portico and *nadan pattu* and quiz competition were conducted. A survey under Organic Charitable Trust was done at Kanthalloor, Idukki from 29th September to 1st October. Nine members from Agriculture club along NSS volunteers and PG students from Environmental Students took part in this under taking.

7.6. **NSS** - led greening-cleaning activities on the campus on a regular basis. As part of '***harita keralam'*** **project** NSS together with NCC units joined the local bodies in clearing a half acre plot of highway land which was a waste dump. It has been transformed and converted into a meeting place and a garden (in the making). 15 tree saplings of indigenous species have been planted.

On Independence Day, a '**Save Periyar**' cycle rally was also organised by NSS unit.

The NSS unit **planted 50 saplings** on the **KURTC** bus stand at Thevara and have taken upon themselves the task of protecting them in collaboration with KURTC employees.

Nattarivu fest - closely linked to bio-diversity is also our cultural diversity. In some cases both are linked. e.g., the *mudiyett* reflects many aspects of nature, and the entire setting and the huge masks are all made directly out of what is available in nature e.g., arecanut leaves and other parts.
Folk songs are rooted in an agrarian culture and refer to the various practices related to food, agriculture, labour etc.

7.7. On the Independence Day, an active campaign for environment friendly living was taken up by NSS unit. NCC units have led cleaning campaign of public places like local Bus stand.

7.8. **College Union** led a campaign of managing waste by creating a recreation area adjacent to college ground and backwaters, naming it *kadavu*. The materials used were waste materials of vehicular parts, plastic bottles, chemical containers, disposable cups etc. The area was converted into a park with plants that would attract butterflies.

A 'recycled' venue for a refreshing time

ELIZABETH THOMAS
DECCAN CHRONICLE

What makes the campus of Sacred Heart College, Thevara, alluring is the lake that flows nearby. When the college union decided to set up a park on the campus, everyone was unanimous about the location. And, they converted a small area close to the lake into a park, which was done using throw-away materials.

Kadavu, the 'recycled park' has tyres as seats, disposable glasses and bottle caps as hangings, mineral water bottles com- bottles from chemistry lab as flower pots.

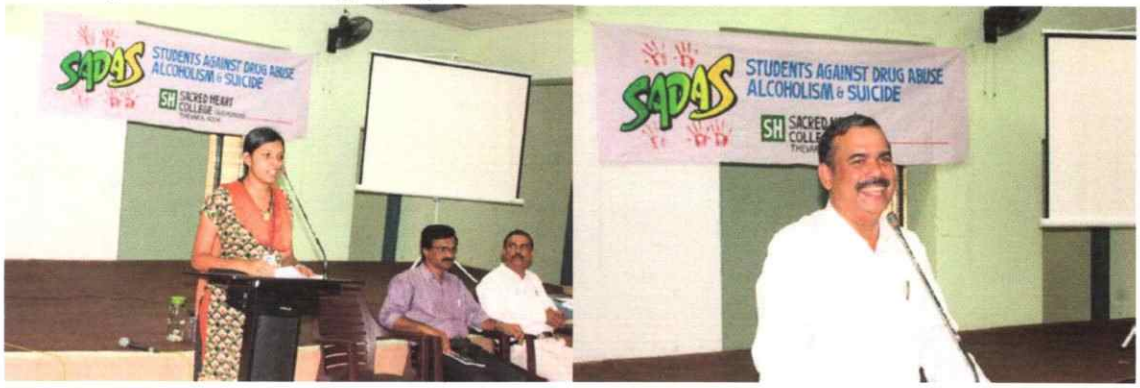
"Most of the materials were collected by students from our campus. Only a few items such as tyre were sourced from outside," says Antony, a second year Economics student, who is part of the venture. "When we began, the focus was on converting tyres into swings and seats. Other ideas came gradually."

The tyres are painted in different shades and one seat has a picture of the movie character, Minion, on it. Coconut shells are also used to decorate the park, which will be a spot leisure time. "The name Kadavu is scribbled on a marble piece we got from the campus. Also, we got a partially ruined ferry that had drowned in the lake. We painted it, doodled on it and put it in the park," says Shano, a third year BSc Botany student. There is also a caricature on the backdrop done by Nikhil Chandran, another student.

An initiative against plastic, the team would expand the area of the park in the future. "This is an experiment. Our next phase plan includes making a space for open classroom here. The park would be open from Monday."

It also presented a **music band 'ORALI'** which is dedicated to environment protection as one of its key areas.

7.9. **SADAS** (Students Against Drug Abuse, Alcoholism and Suicide) is a service club of the college focused in changing the society for the better. Last year SADAS launched a programme called **Addicted to Nature & Tree Challenge** Programme involving students and staff taking up the **challenge of planting trees**. 140 trees were planted during the tree challenge programme.



7.10. **SWASTI** the women's club, had a 2 days of intensive training led by Sri Varghese Paul for making environment friendly products.

7.11. Department Associations take up on a regular basis cleaning activities.

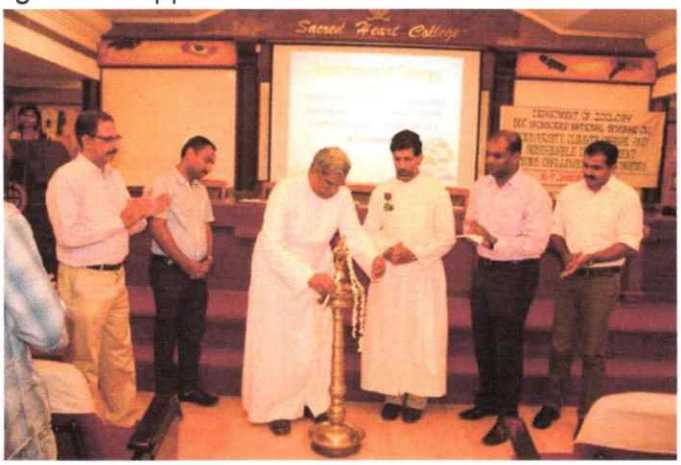
7.12 **Birds Club:** The inauguration of birds club, a sister movement of nature club was done by Dr. Anoop Das of MES College Mampad on 6th December, 2017.

8. ACADEMIC ACTIVITIES

8.1. Introduction of mandatory Environment Education Course - College became first arts and Science College of the state to introduce an additional mandatory environment course of 4 credits. The curriculum was revised to make this mandatory for all UG programmes. The classes are spread all through the first year, with a field visit and the usual tests for assessment. This is done as a token of the campus commitment to promote a lifestyle that has concern for the planet.

8.2. Introduction of new programme in Environment Science - A new M. Sc programme has been introduced in Environment Science and as part of their training they are trained to actively involve in issues of environment especially waste management and promotion of biodiversity.

8.3. Biodiversity Seminar - The Department of Zoology organised UGC sponsored National Seminar on Biodiversity, Climate Change and Sustainable Development; Issues, Challenges and Opportunities on 06.01.2016.



8.4. Principal, Dr. Giby Kuriakose, Prof. Ebin P.J., Dr. Mathew M.J. have been on the regular list of invited faculty on species conservation, bio-diversity, waste management and sustainable development.

8.5. First year students were given a lecture on biodiversity by Dr. Jomy, HoD, Botany, St. Thomas College, Pala

8.6. Two groups of students put up waste management and recycling related exhibitions (MA Economics and M. Com).

9. RESEARCH & PROJECTS

9.1.Orchids

Dr. Giby Kuriakose has just completed a major project on 'Spatial distribution of Orchid communities in relation to their habitat. A new orchid collection has been introduced on the campus and plants are also for sale.

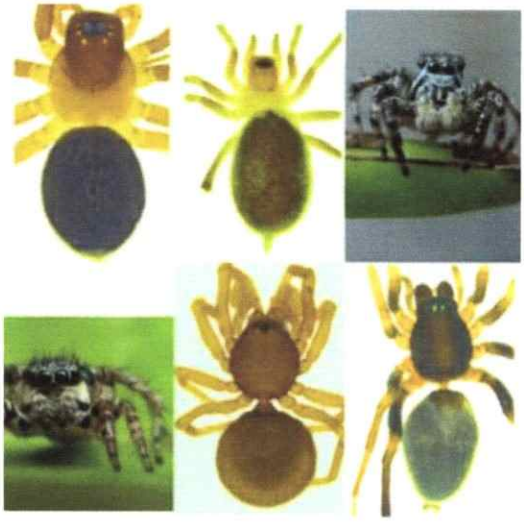
Dr. Giby Kuriakose and Ms. Jis Sebastian have initiated a wild Orchid restoration programme involving school children funded by San Diego County Orchid Society, California, U.S.A. . The programmes were conducted at Wayanad Distrcit.

9.2. **Arachnology –**

The spider research team in the Division of Arachnology of the Department is an expert group on spider taxonomy. Over the years the division has grown to become synonymous with spider research in India. This is the only Arachnology research center in South India and the most well known among the very few in India. Identifying and cataloguing the spider diversity of South India particularly Kerala has been the primary motive of the division since inception. This is the only centre in South India devoted exclusively for the documentation of the diversity of spiders and other related groups of organisms including pseudoscorpions and millipedes. The research team has so far identified more than 500 species of spiders from South India including more than 50 species new to science, around 50 first sightings in India and 60 endemic species. This includes the discovery of two new genera of spiders - an orb-web weaving spider genus *Plebs* and a wolf spider genus *Ovia*. Apart from spiders, the team has also published a taxonomic revision of the south Asian millipede genus *Chondromorpha*. Notably, this is the first ever scientific paper from India on millipedes in the post-Independence era.

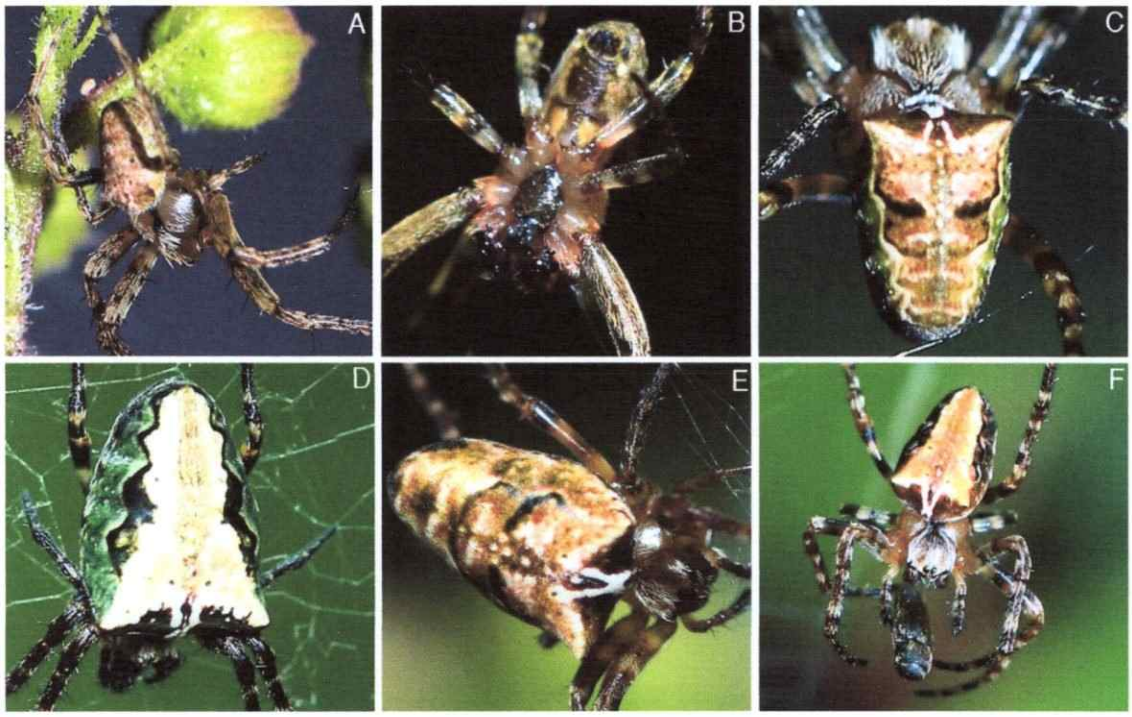
Division of Arachnology discovered seven new spider species in 2016. Of these, *Tropizodiumkalami* and *Tropizodium viridurbium* belong to the family Zodariidae (ant-eating spiders), *Shearellaalii* belongs to the family *Tetrablemmidae* (armored spiders), *Cambalidadeorsa* and *Cambalidatuma* belong to the family Corinnidae (ant mimicking spiders) and *Stenaelurillusdigitus* and *Stenaelurillusgabrieli* belong to the family Salticidae (jumping spiders). The species *Tropizodiumkalami* is named after Bharat Ratna Dr A.P.J. Abdul Kalam, the former President of India, *Shearellaalii* is named after Dr Salim Ali, the Birdman of India and *Stenaelurillusgabrieli* is named after Padma Bhushan Fr. Gabriel Chiramel CMI, the founder of the Department of Zoology. The details of all the new species. The information were published in various volumes of the international journal Zootaxa published from New Zealand.

A new genus was discovered in the Western Ghats called Genus Ovia.

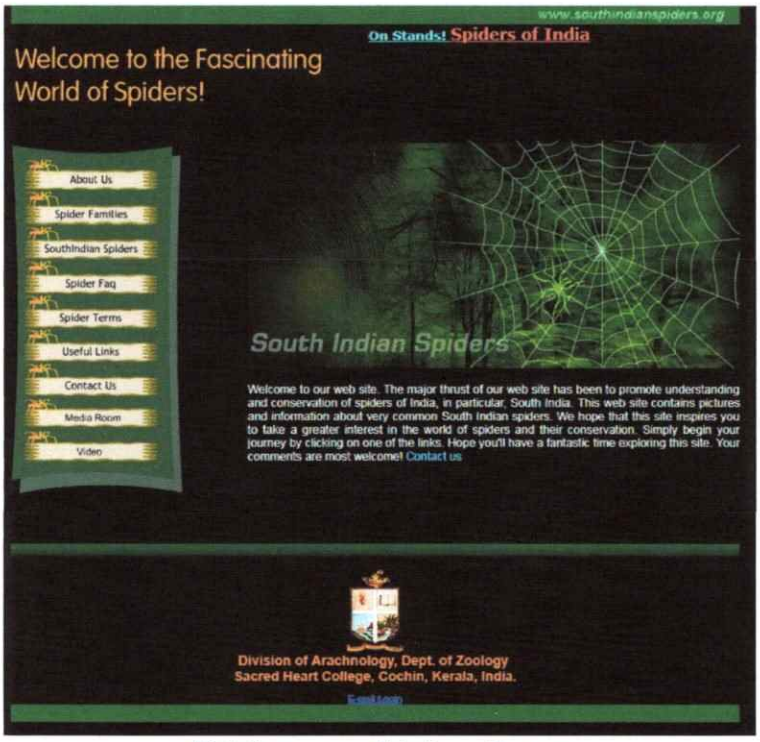


The research team has also successfully carried out a number of externally-funded research projects, mostly on the documentation and quantification of the biodiversity of the spiders of Western Ghats. These include a project funded by Kerala State Council for Science, Technology and Environment, (KSCSTE) Thiruvananthpuram, Kerala on the qualitative study of spider diversity in Ernakulam district, Kerala State; a project funded by Indian Council of Agricultural Research, (ICAR) New Delhi, on the bioecology, conservation and predatory potential of spider fauna in vegetable and rice agroecocystems in central Kerala, with Kerala Agricultural University as the collaborating agency; a project funded by University Grants Commission (UGC) on

the study of the diversity of Mygalomorph spiders; a project funded by Ministry of Environment and Forests (MoEF), New Delhi on the bioecology of spiders of Western Ghats of Kerala; three projects funded by Dept. of Science and Technology (DST) on the study of spiders of Western Ghats; and a project funded by International Foundation for Science (IFS), Sweden on the study of the spider fauna of Agasthyamalai Biosphere Reserve. The team has published more than 70 publications on various aspects of the taxonomy, diversity, ecology, biogeography and conservation of spiders and millipedes, including the much sought after book, Spiders of India.



The team has also launched a website on spiders for the first time in India, www.southindianspiders.org, which is rated as one of the best visually pleasing, colourful and informative sites on spiders. The response to the site has been overwhelming ever since its inception receiving enquiries and responses worldwide.



Website: www.southindianspiders.org

Members of the research team have over and over been honored with international fellowships and grants. These include the prestigious Endeavour Award of the Govt. of Australia for postdoctoral research conferred to Dr. Mathew M.J. and the Encyclopedia of Life (EOL) Rubenstein Fellowship awarded to Dr. Sudhikumar A.V., to name a few. Dr. P.A. Sebastian, director of the division, has chaired many technical sessions in various international conferences of Arachnology.

9.3. Dr.Giby Kuriakose has initiated a study to formulate measures to eradicate Mucuna brachtiata, a nasty weed, from the Kanyakumari Wildlife Sanctuary, Nagercoil, Tamil Nadu from August 2017

9.4. Wetlands – Minor project by Ms. Agile Joy on 'Environmental impact of paddy and pond farming in the pokkali fields of Kerala was completed and submitted to UGC.

9.5. Zoology Projects – group activities

The students of B. Sc Zoology have a hands on training related to bio-diversity. In the final year, they are formed into groups of 5 to 7, under the guidance of faculty members and a year long project on apiculture, pisciculture, cuniculture, quails, poultry etc. are given to them for a 'learning by doing' project.

9.6. Botany PG Projects

Botany Post Graduate students engaged in various research projects every year. Mr. Prasant Prabhu – Diversity of Pteridophytes of Devikulam Taluk

Seethal S.Kumar – Diversity and Taxonomy of Andrographis of Kerala
Sreehari S. Nair – Diversity and Taxonomy of Ficus of Kerala
Sayana John – Floristic Diversity of Ponnukkudam Sacred Grove, Thevackal.

9.7. Aquaculture projects - The promote of Miss Kerala species Dr. Anna Mercy is a faculty on the campus and she has conducted 3 trainings of ornamental fish production for the community in collaboration with MPEDA.

9.8. Botany projects - A research is on as to how the invasive species of 'mile-a-minute' can be converted into useful product like thread or coir.

9.9. Dr. Johnson Palackappilll completed a project on Traditional Food Diversity of Kerala and documented five such practices.

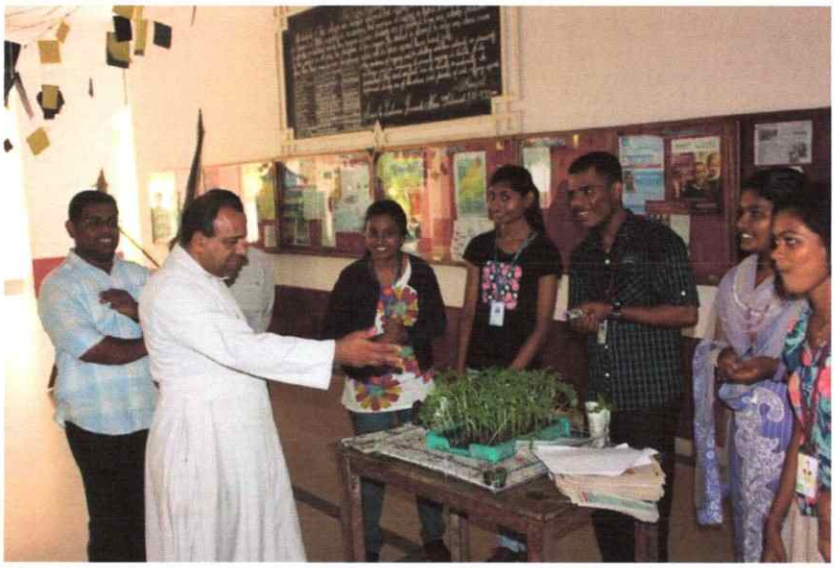
10. ENTREPRENEURSHIPS

10.1. **Heartian Harvest** - Heartian Harvest, a venture of the SH community to apply their knowledge to go beyond mere consumption to green production in order to promote the message of 'healthy living'. Heartian Harvest is a marketplace where students and staff can sell and buy organically produced vegetables, fruits and homemade snacks. The stall is open on all Mondays and Thursdays. About 10 faculty members and 20 students are actively involved in this productive activity.

10.2. **Organic rice powder** – through heartian harvest, the products from the organic farming at Arayankav is converted to value added products like rice powder.

10.3. Botany Department – hands on training has led to production of several materials, which are environment friendly.

10.4. Sapling distribution - Department of Botany prepare saplings of various vegetables and sold in the campus. Around 2000 seedlings were sold.



10.5. Carry bags – Tourism Club initiated training and production of paper carry bags to replace the use of plastic carry bags. MA Economics also have organized similar programme.

11. AWARDS

11.1. Paristhithi Mitra Award – by CEERD (Centre for Environmental Education and Rural Development) of St. Stephen's College, Uzhavoor the valuable services towards the promotion of environmental education, protection and conservation for the year 2017. Last year the college also received a special appreciation from the CEERD.

CEERD

Centre For Environmental Education And Rural Development

ST.STEPHEN'S COLLEGE

Tel: 04822-240127, Fax: 04822-240709, www.ststephens.net.in

Paristhithi Mithra Award – 2017

Awarded to

S.H. COLLEGE (AUTONOMOUS), THEVARA, KOCHI

for the outstanding contribution towards the promotion of environmental education, protection and conservation in the State of Kerala

Uzhavoor 20.06.2017

Dr. Shiney Baby
Chairperson and Principal

Smt. Mercy James
President, Uzhavoor Grama Panchayat

Prof. Jose Thomas
Executive Director

CEERD

Centre For Environmental Education And Rural Development

ST.STEPHEN'S COLLEGE, UZHAVOOR

KOTTAYAM, KERALA-686634 Tel: 04822-240127, Fax: 04822-240709, www.ststephens.net.in

Certificate of Appreciation

The Judging committee for Paristhithi Mithra Award- 2016 specially appreciate S.H. COLLEGE (AUTONOMOUS), THEVARA for their valuable services towards the promotion of environmental education, protection and conservation in the state of Kerala during 2015-2016.

Uzhavoor 10.06.2016

Dr. Mercy Philip C
Principal and Chairperson

Smt. Mercy James
President, Uzhavoor Grama Panchayat

Prof. Jose Thomas
Executive Director

11.2. The Principal Dr. Prasant Palackappillil CMI was the recipient of the Best Principal Award instituted by Retired Principals Association for his selfless services in the management as well as in the field of environmental protection. He is the chairman of ORGANIC KERALA CHARITABLE TRUST which leads organic food production campaign all over the district. He is also sought after as a resource person in various environment related seminars and panel discussions.

11.3. Dr. Giby Kuriakose was awarded with 'Paristhithi Sahithya Puraskaram' constituted by Sahyadri Natural History Society, Thiruvananthapuram for the book 'Vismruthiyilakunna Vrikshangal (വിസ്മൃതമാകുന്ന വൃക്ഷങ്ങൾ).

11.4. Ms. Jis Sebastian, Project fellow, Dept. of Botany - The Dr C. Chandrasekhara Memorial Award for innovative Research in conservation of Forests is awarded to Ms. Jis Sebastian, Project fellow of the Dept. of Botany. Rs. 40000 and a gold medal. She was also selected for a conference at Turkey by British Ecological

Society. She would be presenting the major findings of the recently concluded major project, representing the Dept. of Botany.

11.5. Mr. Dhruv Prajapati - Dhruv Prajapati has been conferred the Young Naturalist Award by Sanctuary Asia. It is one of India's most prestigious wildlife awards. This award is for Individuals between the ages of 16 and 25 from whole country, who show extraordinary caring and respect for nature. They have selected him for his research in arachnology under the guidance of Dr. P. A. Sebastian in research projects in Arachnology.

11.5. Dr. Mathew M J, Asst. Professor, Dept. of Zoology was awarded a Major Project 'Spiders (Arachnida: Araneae) in the cloud forests of the sky islands in Western Ghats: A taxonomic and eco-biogeographical approach' by DST.

Dr. M.J. Mathew also attended the Asian Science Congress of Arachnology, held in China in Nov.2017.

- Best Campus award by Agri Horti-cultural society was given to the college in the year 2015-16.

34th Cochin Flower Show 2016

34th FLOWER, FRUIT AND VEGETABLE SHOW

2nd to 10th January 2016, at Ernakulathappan Ground, Ernakulam.

Certificate

This is to certify that Sacred Heart College Thevara

is awarded Second prize in class A

section Flower Garden variety Educational Institution

Organised by :

Adv. T. R. RENJITH
Hon. Secretary
EKM. Dist. Agri-Horticulture Society

The Ernakulam District Agri-Horticulture Society
Old Collectorate Campus, Opp. Subash Park, Cochin - 682 011
Phone : 2362738, E-mail: agrihortikochi@gmail.com

M. G. RAJAMANICKAM I.A.S.
District Collector & President,
EKM. Dist. Agri-Horticulture Society

11.6. M. Com waste recycling/waste management project presented at Albertian Exhibition in January 2017 was awarded first prize.

11.7. Principal was appointed on the expert committee on Social Impact Assessment of development projects in Greater Cochin as environment expert.

11.8. Mr. Vinil K.V., Dept. of Economics was appointed as the Vice Chairman in one of the committees of the District Planning Board, Ernakulam.

11.9. Dr. Johnson X. Palackappillil is the Vice Chairman, Suchitwamission

11.10. Dr. Johnson X. Palackappillil is a member of the Social Impact Assessment Committee, Kochi Metro

11.11. Prof. Ebin P.J. was selected as District Level Expert Panel of Kerala Biodiversity Board

11.12. Dr. Giby Kuriakose is the District Coordinator, Bird club International

11.13. Dr. Giby Kuriakose is a Life member in Indian Association for Angiosperm Taxonomy

Resource persons

Dr. Giby Kuriakose and Ebin P.J.: Resource persons for the two day workshop on Angiosperm taxonomy "Working with Plants" organized by the Department of Botany, Govt. College, Kottayam on 2nd and 3rd of November 2017.

11. ACTIVITIES - REGULAR AND ONGOING

11.1. Classroom cleanliness campaign is an annual contest based on the maintenance of class rooms which are periodically inspected by a team of staff and graded. Some of the classes have taken initiative to paint the classrooms on their own to maintain them neat and to give an inspirational message to the learner.

11.2. **Campus clean campaign** - Campus cleaning programmes have been continuously organised by various fora of the college like NSS, NCC, women's cell, nature club. Jesus Youth conducts cleaning programme in a weekly basis. The student Development Officers of the college lead the cleaning programme. **Classroom beautification contest** - Each classroom is evaluated by the principal or student development officers in a monthly basis and the best class is awarded. These programmes help to develop an environmental consciousness to the student.

11.3. '***Suchitwa Bodhana Yajnam***', *jointly organized by Rajagiri Outreach and Mithradham was accorded an overwhelming reception and participation by Primrose Nature Club and NSS. Suchitwa Bodhana Yajnam - As part of Suchithwa Bodhaya Yajnjam,* Bhoomithrasena Club of the college, distributed around 500 vegetable saplings at Thevara. They also collected plastic bottles, milk covers and carry bags, as part of plastic recycle campaign. The collected materials will be recycled with the help of Central Institute of Plastic Engineering and Technology (CIPET).

11.4. **Mangrove conservation** - A small patch of mangroves is being preserved near college campus on its border. A larger area near Nettoor railway station is taken up as a conservation project by the Nature Club of the college.

11.5. **Butterfly garden** - There are two locations dedicated for butterfly garden, one being sheltered and protected by the school under the guidance of college, the other directly by the college jointly by Zoology and Botany departments.

11.6. **Nakshatramarangal**- planting saplings corresponding to the zodiac signs was a major initiative of the college. The campus boasts of two sets of Star Trees, and two butterfly gardens, under the guidance of college.

Im^{a}ncw (Strychnos nux-vomica), s\Ãn (Emblica officinalis), A¯n (Ficus racemosa), ഞാവൽ (Syzygium cumini), Icn§men (Acacia catechu), കരിമരം (Diospyros ebenum), മുള(Bambusa bambos), അരയാൽ (Ficus religiosa),നങ്ക് (Mesua ferrea), പേരാൽ I (Ficus benghalensis),]vemiv (Butea monosperma), C¯n (Ficus tinctoria), A¼gw (Spondias pinnata), കൂവളം (Aegle marmelos), നീർ മരുത്(Terminalia arjuna), h¿w ssIX (Flacourtia jangomas), Ce^{a}n (Mimusops elengi), sh«n (Aporusa lindleyana), shÅ ss]\v (Vateria indica), വഞ്ചി(Salix tetrasperma),]vemhv (Artocarpus heterophyllus), Fcn¡v (Calotropis gigantea), h¶n (Prosopis juliflora), IS¼v (Anthocephalus cadamba), മാവ് (Mangifera indica), Icn¼\ (Borassus flabellifer), Cen¸ (Madhuca longifolia)

11.6. **Visits and Nature Camp** by student groups as part of environment study were made to Thattekkadu, Munnar, Kanthalloor, Marayoor, Anamudichola, pampadumchola, Wagamon, Chinnar, Iravikulam-Rajamala, Athirappally, Kaipuzha, Vazhachal, Kapradkkad, Mangalavanam, Wayanadu etc. BSc Zoology students also visited Bombay Natural History Society, Bombay Natural History museum, Ghautala Wildlife Sanctuary, Maharashtra etc.

11.7. Greening – Every major occasion or visitor, and at times batches are celebrated by planting trees – all of them indigenous, and some of them very rare and enlisted in the list of threatened or endangered species (for example, Dr. A.P.J. Abdul Kalam planted Koori (*cynometratravancorica*) and Dr. M.S. Swaminathan planted Rudraksham (*Elaeocarpusganitrus*)

11.8. Bio fencing using Thunbergia grandiflora and Passion Fruit was introduced in front of College canteen to prevent dust.

11.9. Bio wall - The new toilets constructed on the East Campus was to be having a brick wall. Instead, a bio-wall of bamboo and similar varieties have been erect.

11.10. Bio Bouquet - Using Bio Bouquet to welcome guest of programmes becomes a practice in the college.

11.11. Waste Management - Waste is gathered and periodically segregated into bio-degradable and recyclable, and a small income is annually generated from the disposal of recyclable waste to the tune of about Rs. 30000.00 per annum.

12. ACTIVITIES - NEW

12.1. **A New Healthy Practice to conserve bio-diversity:** College hand book is brought out on the basis of the UN Theme of environment. This year it was on International Year of Pulses. This year, it was decided to have only minimum information required to be printed in the handbook and the regular information of awards and rules & regulations were published on the website. Even the detachable scholarship application form was avoided and made available on the website so as to save at least 50000 pages. Similarly, the annual news letter which used be printed about 2500 was restricted to 1000 and was made available on the web in order to save paper.

12.2. **Periyar Protection Campaigns** - *Punarjani*, an awareness programme about the deplorable condition of the river Periyar and its protection. The event was star-studded with eminent personalities like Dr K.J. Yesudas, Biju Narayanan, Captain Raju and Kochouseppu Chittilappally. A master plan for the protection of Periyar was introduced. College has been an active partner in the various campaigns related to Periyar Protection. Dr. C.M. Joy has been spearhead 'puzha samarakshana samithi' of Aluva.

12.3.Green audit - A green audit has been initiated by the college in which five areas are covered such as water audit, energy audit, green campus audit, carbon footprint and

waste audit. The Audit is being done under the leadership of Dr C.M. Joy, former faculty of the Department of Botany of the college. Nature club, Department of Physics, NSS, NCC and Women's Cell collect data for the green audit.
Dr C.M. Joy has formed a consultancy for Green Audit and he has been invited to do green audit of several institutions.

12.4. **Celebration of International Year of Pulses**

- In relation to International Year of Pulses (IYP) 2016, SH College Thevara in collaboration with Kerala State Council for Science, Technology and Environment (KSCSTE) has organized different programs on 09th and 10th December 2016. The college has organized a seminar and different intercollegiate competitions in connection with international year of pulses. The IYP 2016 aims to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production aimed towards food security and nutrition.
- Traditional food of pulses with jaggery and coconut was served for the participants.
- The one day seminar entitled 'Innovations in Organic Farming: Prospects and Challenges' was organised on 9th December, 2016.
- A poster competition was held on the topic "Pulses for our future' on 10th December, 2016.
- Elocution competition was also held based on the topic 'Role of pulses in sustainable food production' on 10th December, 2016.
- An intercollegiate debate competition was held on December 10th.
- Pulses poster exhibition - 02.08.2016. The leading Malayalam Nature poet Sri Murugan Kattakkada spoke and recited many poems related to environment protection. The outstanding among them was 'Manne nambi maram irippu... namme nambi mannirippu'.
- Pulses – Quiz was conducted.
- Exhibition of pulses - An exhibition of 40 different varieties of pulses was arranged at the college portico on 22.11.2016
- Pulses farm - a two-cent plot was converted into a pulses plot with Tuvara Dal as border. 1 meter

12.5. **Fruitipedia** - Department of Botany organised the second edition of fruitipedia this year on 3rd August, 2016. Endemic and exotic fruits varieties with brief description were exhibited in the college portico.

12.6. **Flora Fest** - The Department of botany organised Flora fest, the cultural fest of Botany. As part of the fest, a spectacular exhibition - "Kinash" was arranged in which hand made products, indigenous food items, vegetable seedlings, flowers, medicinal plants and mural paintings were exhibited.

12.7. Integrated farm development – Animals rearing & waste management - The campus boasts of various domestic animals providing a rich blend of animal husbandry and organic farming. This is led by two of the faculty members Dr. Fr. Joseph (English) and Fr. Tomy (German). There is a farm of cows, goats, poultry, ducks, turkey. Etc.

Student projects involve rearing of chicken, rabbits, guinea pig etc.

The campus fish production of Thilapia (red-belly), Vaala, Pearl spot and Kuruma led to a haul of about 150 kgs this year.

Apiculture is also done by a group of students as part of their projects.
There are two cows tethered in the college grounds so as to biologically control the growing grass and gather bio-manure (cow dung). The food waste collected from bins is used as feed for the poultry on the campus. There is also a dog of local breed.

12.8. Wealth from Waste for Social outreach - Jesus Youth of the college collected waste from the college and neighbouring houses and the amount generated (25000) from the the waste collected was spent for the needy people of the locality. Jesus youth also collected used dress materials (around 3000) and distributed to the needy.

12.9. Re-use Society Jesus Youth led a campaign to gather waste pen on the campus and cleaned and converted many of them by inserting new re-filler and was sold at subsidized rate at the campus 'honesty shop'. Around 200 pens in a week are reused through this shop.

ഓണസ്റ്റി ഷോപ്പുമായി
തേവര എസ്.എച്ച്. കോളേജ്

12.10.Exhibits of household utilities from Waste - Since waste management is closely linked to environment protection and bio-diversity, many efforts are made to reduce and manage waste. There is a regular exhibition by Commerce students named 'UMANG' which showcases various models of transforming waste materials into useful products. Their participation won first prize in an inter-collegiate event held at St. Albert's in late January 2017.

12.11. Special Trees on the campus

- Calamus gamblei (chooral - cane)
- Cynometra travancorica (Endemic and Endangered) Fabaceae- Koori
- Cynometra beddomei (Endemic and Endangered) Fabaceae - Koori
- Hopea racophloea (Endemic and Endangered) Dipterocarpaceae -

- Vateria indica (Endemic and Endangered)- Dipterocarpaceae - Vellapine
- Vatica chinensis (Endemic and Endangered)-Dipterocarpaceae - Adakkapine
- Terminalia bellerica (Medicinal)- Combretaceae - Thanni
- Hydnocarpus pentandra (Endemic & medicinal) - Marotti
- Antiaris toxicaria (Moraceae) (Medicinal and Endemic) – Marvuri
- Santalum album – Sandal wood – Chandanam
- Aloe vera (Non bitter variety)
- Butea monosperma (Flame of the forest) (Plaash)
- Chayamansa (Mexican leafy vegetable)
- Anona squamosa Mullaatha
- Simaruba glabra (Lakshmitharu)
- Tetramelos nudiflora (Cheeni)
- Pterocarpus santalinus (Rakthachandanam)
- Alstonia scolaris (ezhilam pala)

12.12. New trees planted

The college has initiated planting a new row of varieties of coconut trees in the lake-view area. It has now 6 d x t varieties included. Other new species introduced were: Bauhinia tomentosa (Yellow Orchid Tree - *Manja Mandaram*), fig, Vellachampa, Peraal, Kumil, Chinese Guava (*Pera*), Rambootan, etc

12.13. Celebrate Menstruation - Towards eco friendly menstrual practices - an environment friendly menstrual training programme was launched on the International Women's Day. The programme, for the first time in Kerala, provided eco-friendly menstrual training thereby pointing at the women's role in the conservation of nature. Apart from 'Surakshita Kochi', Anbodu Kochi and people for Animal (PFA) also joined hands for the venture. Eminent personalities like Ms Saali Kannan, the National Award winner for animal welfare and Dr CM Joy, environmentalist were also present at the venture.

12.14. ***Krishi Gatha*** – Organic farming was the major landmark programme of the college. The students and staff of the college join hands together in planting paddy saplings in four acres of paddy field at Arayankavu. The knee deep muddy paddy field and the green saplings threw open before the students a new world of farming experience. This event acquainted the students with organic farming. This programme ensured the lively participation of the local people, making it a collaborative endeavor.

The cultivation of the upland paddy (karanellukrishi) – It was the fifth consecutive year of experimental upland paddy cultivation undertaken by the college. The project was conceived to provide the students with direct experience of the various stages of organic paddy cultivation. Though the yield was below what was expected, the

whole experience was richly rewarding to the participants. Kuruva paddy variety was cultivated this year.

12.15. Speaking Walls

As a students' response to Biennale, a fest was organised by college union called 'parva' under which the students were permitted by the management to make use of the walls for communication through paintings. Most of them are based on environment and sustainability.

12.13. Water Conservation Efforts

Two new wells have been dug for tapping surface water, instead of bore wells which lead to greater exploitation of water. Of the two one is being re-charged with a re-charge pit with water collected from the terrace.

Our newly proposed building plans include underground rainwater storage facility and water recycling facility.

The backwaters of Vempanadu adjacent to the campus was cleaned twice of the waste - especially, plastic - with students spending service learning hours.

12.14. **Fort Kochi beach cleaning** programme was led by HEAL as part of students' service learning programme. Every week there will be a batch of 30 to 100 students go to the beach and involve radically beautifying a part of this common heritage. As

12.15. A regular water analysis unit is managed under the leadership Prof. Midhun of Chemistry department.

12.16. A huge water storage tank of about 40 cents (capacity of 30 Lakhs litter) has been created in the wet-land paddy field at Thottara, jointly owned by the College and Rajagiri College of Social Sciences. It has immense storage of clean water which was extremely useful in the paddy cultivation during summer, at a height of 6ft from the ground level, using earthen bunding. It also very helpful for the birds around the paddy fields during the summer days.

12.17. Water conservation efforts – rain water, wells, tanks. The college boasts of 30000 litre rainwater harvesting tank. A well was dug to take care of the water needs and to tap surface water. Another small well with a recharging pit was introduced as part of this campaign.

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12.18. Energy Conservation and Alternatives

Already a solar unit of 20 kw is there on the campus. A proposal for on-grid plant of 30 kw has been proposed to the KSEB and funding resources are being tapped.

12.19. Gobar Gas plant - The management residence kitchen energy needs are being managed by a huge **gobar gas plant**. Water boiling in the college canteen is entirely done on energy generated from bio-gas from kitchen waste.

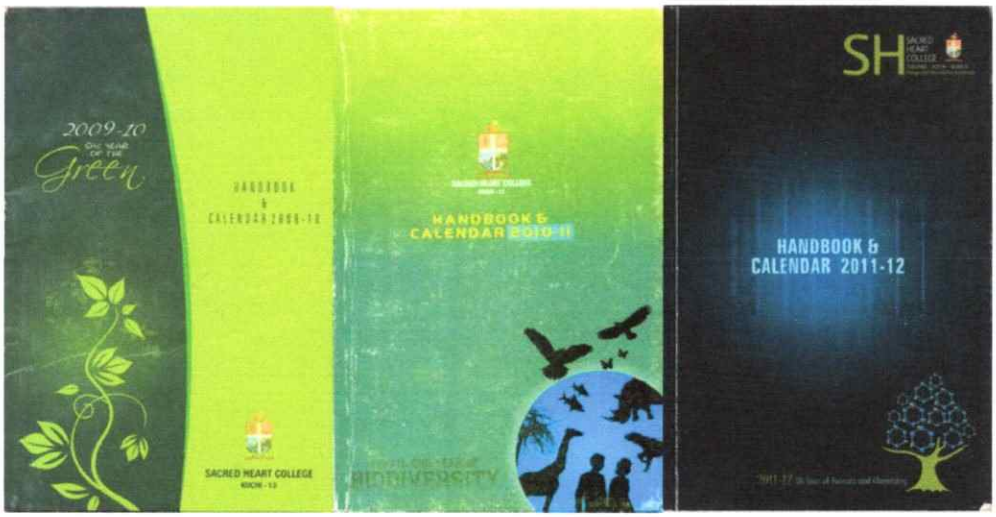
12.20. Car Pooling - Two teams of staff members practice car pooling so as to save energy and save money.

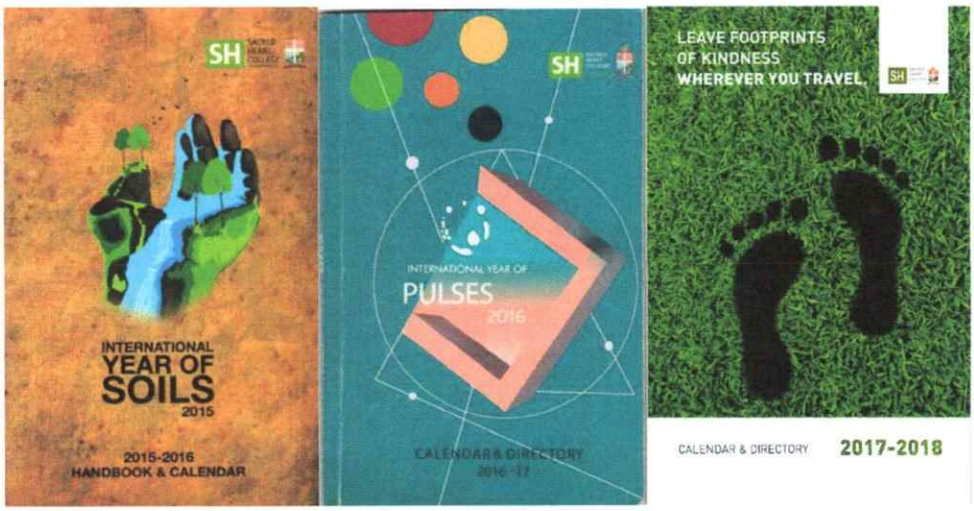
12.21. Bicycle riding is encouraged and promoted on the campus. A special award is given to regular bicycle users during the annual day. A **bicycle rally** was conducted to create awareness on environment on Aug. 15th.

12.22. Six windillators have been installed on roof tops to control heat of the buildings. These are energy saving mechanisms.

12.23. College handbook cover

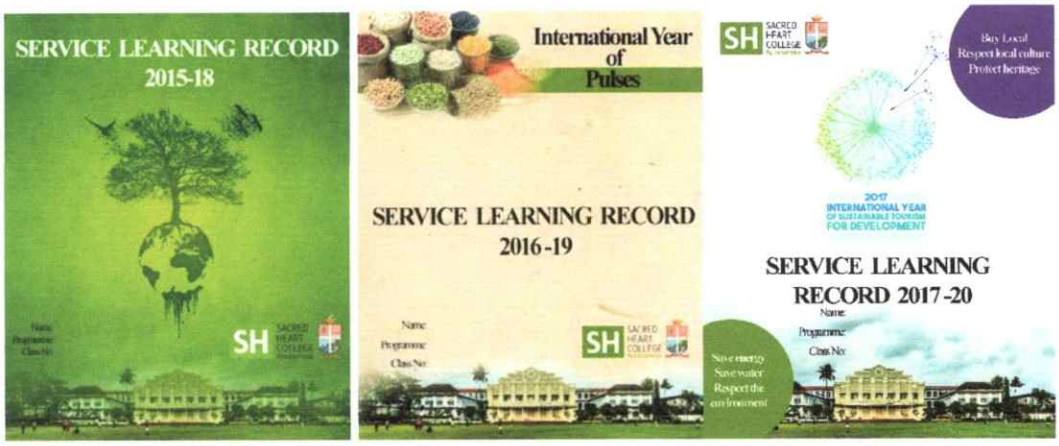
College handbook is designed on the basis of the UN Theme.





12.24. Cover page of Service Learning Record

A mandatory one-credit course of service learning is included in the UG programme. A student has to complete 40 hours of service for the successful completion of the degree. Most of these hours are used for environment protection and conservation of biodiversity. So a culture of environmental protection is developed in students. The cover page of the service learning record is also designed based on the UN theme.



12.25. Other Healthy Practices

No to 'disposables': It has been a practice to use no disposables plates in the programmes conducted in the college. Efforts are being made to avoid the paper disposable cups as well realizing their adverse impact on the environment. For this 300 steel glasses have been purchased to be used during functions.

It has been carefully monitored that no sweets wrapped with plastic is distributed during celebrations organised by the college. Rather more environment friendly groundnut sweets (kappalandi mithai) or gingely balls (*ellunda*) are introduced.

12.26.Re-use of used FLEX - Student volunteers convert used flex into beautiful backdrops for various programme organised in the college.

12.27. 35 Students visited Thenmala Ecotourism and cleaned the premises of the ecotourism and dam. They also make a campaign for cleanliness practices to the visitors.

13. FUTURE PLANS FOR DEVELOPMENT

- **A** green building is planned to accommodate the growing needs of development of the College. This 120000 sq feet building is proposed to be energy efficient, green, with sufficient provisions for water recycling and rain water harvesting, besides having a bio-diversity rich boundary.
- Platinum Jubilee Bio-diversity Register is planned to develop in the next year. A local Biodiversity Register (Divisions 57 and 58) is also planned.
- Bio-diversity section in the existing Heritage Museum of the college will be created.
- Conservation of Mangrove patch in collaboration with Maradu Municipality and Southern Railway.
- Converting the 35 acres of the campus to a bio park

14. CONCLUSION

Sacred Heart College, after its vision, is in relentless pursuit of sustainability and as a first step, making efforts to be a Green Community, starting with green campus. We are very glad to present our activities for promoting, preserving and conserving

biodiversity which is dependent on human awareness and critical action. As an academic institution, this includes teaching-learning, research and reaching out to others, besides, regular activities, directly or indirectly affecting bio-diversity. These have been briefly presented for your perusal and judgement.