

**LOYOLA COLLEGE OF SOCIAL SCIENCES
THIRUVANANTHAPURAM**



CRITERIA 7: Institutional Values and Best Practices

7.1.6- Quality Audits on Environment and Energy

7.1.6-1 Environment and Energy Audits

Green Audit of Loyola College of Social Sciences includes Energy Audit, Water Audit and Environment/Biodiversity Audit

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Green Audit of Loyola College of Social Sciences



Tropical Institute of Ecological Sciences (TIES)
Ecological Research Campus,
Velloor P.O. Kottavam



PREFACE

As part of NAAC accreditation programme, Green Audit is a mandatory component for fulfilling the requirements for the accreditation. Green audit includes energy audit, water audit and biodiversity audit. **Tropical Institute of Ecological Sciences (TIES)**, the affiliated research center of Mahatma Gandhi University, has initiated College NGO Partnership Initiative (CNPI) CNPI programme in their college involving students and faculty members. We started our collaboration with **Loyola College of Social Sciences**, Trivandrum in September 2013, during the first green audit of the campus. We continue this collaboration till date.

In CNPI programme, Green Audit is the major component. It is basically a student capacity building programme, equipping them to meet the challenges and to evolve a socially and environmentally responsible society. It aims to inculcate research culture among the students and faculty of the college and to develop the right scientific temper and outlook.

Acknowledgments

We express our profound sense of gratitude to IQAC team of Loyola College of Social Sciences, Thiruvananthapuram for entrusting TIES with the responsibility of conducting Green Audit. The flora and fauna of Loyola College of Social Sciences, Thiruvananthapuram is promising and therefore we acknowledge the toil and concern of the priests, faculty of the past decades and the alumni for their earnest efforts in the past to retain the beauty of the campus. TIES take the opportunity to individually thank Rev. Fr. Sunny Kunnapillil S.J., Manager, Dr. Saji P Jacob, Principal, Rev. Dr. Sabu P Thomas S.J., Vice Principal, Dr. Jasmine Sarah Alexander, IQAC Coordinator, Dr. Francina P. X, Biodiversity Club Coordinators for continuously providing assistance in carrying out the assessment.

The audit was conducted in two phases. We convey our sincere gratitude to the students of Loyola College, especially Ms. Chippy Raj, Mr. Alan Berchmans, Ms. Gopika Rajendran, Ms. Angel Mariya Dominic & Mr. Vinayak Karthikeyan for coordinating and compiling the data. We acknowledge the contributions of Mr. Arafath Muhammaed A, Ms. Joshni Jose (team Haritham) Mr. Bilbilal P Saji (team Jaivadeepthi), Ms. Rejitha Revi and Ms. Rosemary Paul (team Bhoomika), Mr. Sam Santhosh Mathew and Ms. Jumy George (team Lime) in coordinating different student groups and helping us in data collection process.

We also acknowledge the whole hearted support of the faculty coordinators Fr. Renjith I George S. J, Dr. Joice Joseph, Mr. Andrew Michael and Dr. Pramod S.K for their unflinching efforts and team work throughout the audit.



TROPICAL INSTITUTE OF ECOLOGICAL SCIENCES
Ecological Research Campus, K.K.Road, Velloor P.O., Kottayam, 686 501. Kerala, India.
Tel: - 9497290339, 9633723305, 0481- 2957050.
Email: tropicalschool@gmail.com;

Approved Research Centre, Mahatma Gandhi University, Kottayam
Approved laboratory of Pollution Control Board

T I E S - t i e s M i n d a n d N a t u r e

CERTIFICATE

This is to certify that the report entitled Green Audit (Energy, Water and Biodiversity Audit) carried out by the students and faculty of Loyola College, Trivandrum is a bonafide work conducted in collaboration with the collaboration of Tropical Institute of Ecological Sciences (TIES), Kottayam, during the period between March 2021- November 2021.

Thanking you,
Sincerely,

Dr Punnen Kurian

Secretary, Tropical Institute of Ecological Sciences (TIES)
Kottayam



28.01.2022,
Velloor



www.ties.org.in

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ABOUT COLLEGE

Known as a college with a difference, Loyola College of Social Sciences was established at Thiruvananthapuram by Jesuits, a global missionary network committed to excellence in education with social justice. Affiliated to University of Kerala, the college offers courses in M A (Sociology), MSW (Masters in Social Work), MAHRM (Masters in Human Resource Management) MSc Counselling Psychology and MSW (Disaster Management). The College is affiliated to the University of Kerala and is a recognized Research Centre of the University, and guides students for Ph.D. in Sociology, Social Work and Management Studies.

1. HISTORY

Jesuit Education is a living tradition that calls for open eyes, ears, and hearts. The living tradition of Jesuit education is committed to human excellence, global citizenship, the care

of all creation, justice, be accessible for all, inter-culturality, and life-long learning. (Link to Living Tradition,). The Jesuit education aims at forming men and women for others, leaders of competence, conscience, compassion and commitment. The objective of Jesuit education is to assist in the total formation of each individual within the human community. St Ignatius of Loyola, the founder of the Society of Jesus says “The wellbeing of the whole world depends upon the education of the youth”. Thus, Jesuit education paves the way for understanding the world we live in.

Loyola College of Social Sciences is a living tradition, an organic entity of Global Network of Jesuit Higher Education, shares the same Ignatian DNA. Loyola College, one of the oldest Social Science Colleges in India, was founded in 1963 by a visionary Jesuit Fr. Joseph Edamaram to bring social changes in Kerala and society at large. The institute instils excellence in life through service.

The faculty members take up research projects at various levels. A full-fledged Extension Services, Loyola Extension Services (LES) is an integral part of the College. The LES acts as the Social Lab of the College.

True to the Jesuit tradition of MAGIS (Excellence) and the commitment to Faith and Justice, Loyola strives to reach the benefits of higher education to the people, especially the marginalized. In reaching this goal, we are guided by the Ignatian vision of life and its application in Jesuit Education.

- A pioneering institution in social sciences
- A hub to learn and grow with social sensitivity
- Unique learning ambiance
- A student-friendly campus
- Mentoring- One student-one teacher relationship
- Value Clarification
- Vibrant Alumni Association
- Serving the community, serving the poor
- Engaged Knowledge Building
- Social labs with effective integration of theory and practice

- PIMER – A Vision-Based Management (Planning, Implementing, Monitoring, Evaluating, Reforming/Reimaging)
- Globally Rich Jesuit Heritage

2. VISION AND MISSION

Vision

Fostering excellence in thinking, commitment and engagement for holistic transformation

Mission

Engaged knowledge building for grooming positive, innovative, and value oriented thought leaders capable of driving sustainable social transformation

Core Values

Excellence /Magis

Integrity

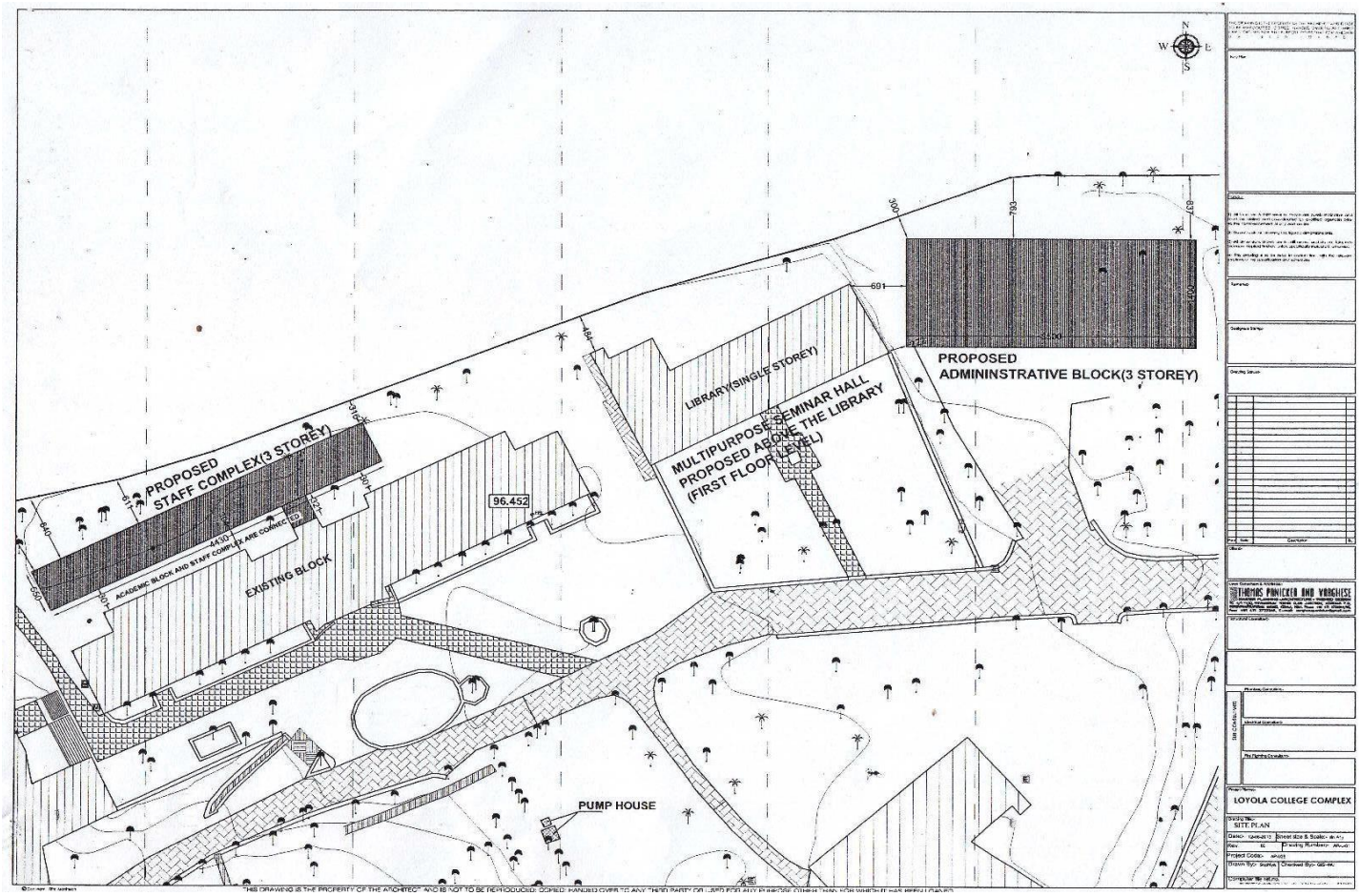
Secularity

Inclusiveness

Motto

Excellence in Life through Service

4.SKETCH OF COLLEGE CAMPUS



5. CNPI AT LOYOLA COLLEGE

College - NGO Partnership Initiative (CNPI) was initiated at Loyola College of Social Sciences, Trivandrum under the guidance of Tropical Institute of Ecological Sciences (TIES). The aim of the CNPI was to inculcate research culture among the students and faculty of the college and to develop the right scientific temper and outlook. Green Audit was the major component of CNPI programme; it consisted of Water Audit, Energy Audit and Biodiversity Audit.

CNPI is a mutually benefitting research-cum- extension project of TIES, involving students and faculty of Loyola College of Social Sciences. The introduction of project work for college students is a significant step to promote research culture, but the prevailing system does not allow much progress in the area. Considering this fact, National Assessment and Accreditation Council (NAAC) has included this aspect in the NAAC accreditation process and set up criteria for assessing the performance of colleges in research and extension programmes based on College - NGO collaborative programmes. **Green Audit** is a compulsory exercise that NAAC demands too which is the most significant component of CNPI programme.

TIES-CNPI provides ample avenues for the college to improve their stakes in research and extension activities involving faculty and students of Loyola College of Social Sciences, with the constant support of experts and scientists from TIES. Being an environmental research and action organisation, TIES will be benefitted through the rich human resource and localised infrastructure support from the Loyola College. In brief, the college can use their rich human resource and infrastructure facilities for conducting socially and environmentally important research and extension activities availing the vast expertise of Tropical Institute of Ecological Sciences, in the conduct of related projects and programmes.

5.1 GENERAL OBJECTIVES

- ❖ To provide research support to the college to conduct research projects on social and ecological issues involving faculty and students
- ❖ To conduct community extension and development projects through Peoples Research Programmes (PRPs)
- ❖ To impart scientific methods and research techniques among students and faculty to deal with emerging social and environmental issues
- ❖ To study, suggest and implement solutions to environmental problems through timely interventions

5.2 BENEFITS

BENEFITS OF LOYOLA COLLEGE OF SOCIAL SCIENCES

By conducting CNPI programme, the students and faculty of the college will have an opportunity to participate in research and extension projects in socially relevant and applied areas. The students will be trained in preparing scientific reports and can publish their reports based on their studies and activities. As a result of the programme, stake of the college in community development programmes (waste management, water and energy conservation, natural farming, livelihood issues, gender issues etc.) will be enhanced. Moreover, Green Audit is an essential criterion for NAAC accreditation.

BENEFITS OF TIES

By collaborating with the CNPI programme of Loyola College, TIES will have a richer human resource support for its further research programmes. Besides, the scientific reports of green audit in the college will be jointly published with college contributors. Moreover, TIES will have an improved database and stake in community developmental activities.

5.3 METHODOLOGY

We had former association with CNPI as part of 3rd cycle of NAAC accreditation. The review meetings (online) and telephonic consultations are conducted as and when required. The orientation programme on Green Audit was given by concerned faculty who participated and coordinated previous audits. Besides this, the newly started department (MSW in Disaster Management) faculty also supported the initiatives. Dr. Joice Joseph, who has his Ph.D. in Environmental science and disaster management also support the programme. Students and faculty members from the college attended the orientation programme given. The audits were conducted at different phases. The process started in January 2020. Orientation was given to the students but later due to lock down we could not continue it. The second phase was on 9th February 2021 and third phase was on 22nd November 2021.

Though it was planned in advance, due to Covid-19 pandemic and lockdown students were not available in the campus. In the second phase, on 9th February 2021, at 9.00 a. m, all students gathered in the Sutter Hall for a common meeting. This was also part of NSS camp conducted in the college. Due to the pandemic, the camp was also done in college. Dr. Saji P Jacob, principal addressed the students and staff highlighting the importance of green audit. This was followed by the session by Dr. Francina P. X., staff Coordinator of Green Audit and Bio-diversity club. The college already has an active Environment and bio-diversity club, in which all students are part. The club members are divided into four groups. After getting orientation about Green audit, students gathered in their respective groups to conduct water audit, energy audit and biodiversity audit. The areas of the college were divided and given to different groups for conducting audit. The study was conducted during the period January 2020- November 2021.

6 WATER AUDIT

6.1 INTRODUCTION

Water audits provide an enjoyable educational way for students to examine the ways that they use water every day, and to encourage classmates, teachers and college administrators to make their college more water-efficient and cost-effective. By completing the project, students and college staff learnt about the amount of water that is consumed in the college for activities including washing hands, drinking, in the laboratories, watering landscaped areas and flushing toilets and urinals. From the results obtained, students and staffs will consider better ways to improve water conservation throughout the building and on college campus.

6.2 AIM

- To find out the usage pattern and conservation of water in the Loyola college campus

6.3 OBJECTIVES

- To find out the pattern of water use in the Loyola college campus (both indoor and outdoor)
- To find out the quantity of water wastage in the Loyola college campus
- To suggest remedial measures and water conservation practices

6.4 METHODOLOGY

The study was conducted during the period January 2020- November 2021. After getting orientation about Green audit, students were divided into groups and conducted mock audit. For the study, the students were further divided into four groups. 1st group was assigned to do water audit in the Men's hostel, 2nd group in the Ladies Hostel and 3rd for in and around college campus which included College building, Library.

Fourth group in Sutter Hall, chapel, canteen, outdoor lighting and garden. Each group visited every water installation twice during the period. Thus, altogether 4 groups have conducted 16 visits during this period. The data was tabulated and analyzed.

After finding out the leaking taps, it was made notice to the Management and got repaired in the same week.

6.5 RESULTS AND OBSERVATIONS

The data on water usage pattern of the Loyola College campus was estimated through a systematic and time-bound survey. The total water usage data is given in Table 1. The highest quantity of per day water usage was observed in kitchen followed by hostels (Fig.1). The average time of water outlet use is more in bathrooms of ladies' hostels is less than in the kitchen. The water outlet use is relatively less in men's hostel. There is not significant variation in the use of water in ladies and men' hostel. The total daily usage of water is found as 35276 litres and the per capita daily use of water is 40.36liters of water (Table 2).

There are 18 water tanks in the college with a total capacity of 31000 litres (Table 3). However, the total quantity of water pumped a day is 48000 litres approximately. The loss of water through leakage in the campus is also estimated. A total of one tap was leaking and average loss of water due to the leakage is 15 litres per day (Table 4).

The amount spent for electricity that used for pumping motors and pumps were also estimated. It was found that on an average Rs. 3378.96 is the bimonthly expense. This is higher than last audit average of Rs. 2616.58, because of the use of water in the construction of new building that is going on.

Table 1: Total water usage of Loyola College Campus

SL. No.	FIXTURES	RATE OF DISCHARGE (litre/Min.)	DURATION OF USE(m inutes)	AVERAGE QUANTITY PER USE(litre)	NO. OF USES	TOTAL DAILY USES (in litres)	PER CAPITA DAILY USE (in litres)
1	Kitchen Tap	5	2625	20	525	10500	50
2	Utility Taps (33 Taps)	4	1680	16	420	6720	32
3	Bathroom Faucet-92 (Ladies Hostel)	4	1560	16	390	6240	96
4	Bathroom Faucet-2 (Men's Hostel)	4	552	16	138	2208	96
5	Bathroom Faucet-3 (College)	3	1260	12	420	5040	24
6	Other Bathroom Faucet-1	3	12	12	4	48	1.6
7	SHOWER-1 (Boys Hostel)	5	210	20	42	840	40
8	SHOWER-2 (Girls Hostel)	5	650	20	130	2600	40
9	Outside Tap 4	3	270	12	90	1080	24
10	Lab Taps	0	0	0	0	0	0
						35276	40.36

Notes

No. of uses - 210 persons 6 times a day.
 Average quantity per use - 1persons *per use 2 minutes*5 rate of discharge/2
 Total daily use - 210person*2minutes*6 times*4rate of discharge
 Utility Tap - No. of uses - 210 persons 2 times a day.
 Ladies Hostel - no. 65 no. of use 8 times a day.
 Men's Hostel - no. 21 no. of use 8 times a day.
 COLLEGE - toilet 2 times 210 people a day
 100(ladies+ staff)* average use 3 times* -
 55 men's outside bathroom* average use3* 1
 min.

6.6 SUMMARY OF RESULTS

Table 2: Consumption of Water in the college

Particulars	Quantity of water (in litres)
Total daily use of water	33596
Per capita daily use of water	39.560

6.7 WATER TANK –STORAGE CAPACITY AND USAGE PATTERN

Table 3: Storage capacity and frequency of filling water tanks in the college

Target building of the tank	Capacity	Frequency of filling per day (depends upon usage-average)	Average amount of water usage (Litres /day)
College	5000 litres x 2 = 10000 litres	1-2 times/day	20000
Men's Hostel	6000 litres x 2 = 12000 litres	1 time per day	1200
Ladies Hostel - 1	500 litres x 14 = 7000 litres	2 time per day	14000
Ladies hostel-2	1000 litres x 2= 2000 litres	1 time per day	2000
TOTAL	18 tanks - 31000 litres	---	48000 litres

Table 4: Total loss of water per day due to leaking taps

Item	Quantity
No. of leaking taps	1 tap
Quantity of water loss per day through leaking taps	15 litres/day
Total loss per day	15litres/day

Table 5: Electricity bill for Pump & motor/ month

Month/Period	Borewell- Consumer No. 2254	Pump - Consumer No. 1191	Amount in Rupees	Average (in Rupees)
May, 2019	127	2227	2354	3378.96
July, 2019	85	2723	2808	
August, 2019	113	3191	3304	
September, 2019	110	3747	3857	
November, 2019	127	3653	3780	
January, 2020	151	3547	3698	
May, 2020	115	1699	1814	
August, 2020	101	1286	1387	
September, 2020	118	2611	2729	
November, 2020	113	4826	4939	
January, 2021	176	9255	9431	
March, 2021	187	155	342	
April, 2021		155	155	
May, 2021		4261	4261	
July, 2021	95	4261	4356	
September, 2021	93.12	4755.35	4848.47	
Total	1711.12	52352.35	54063.47	

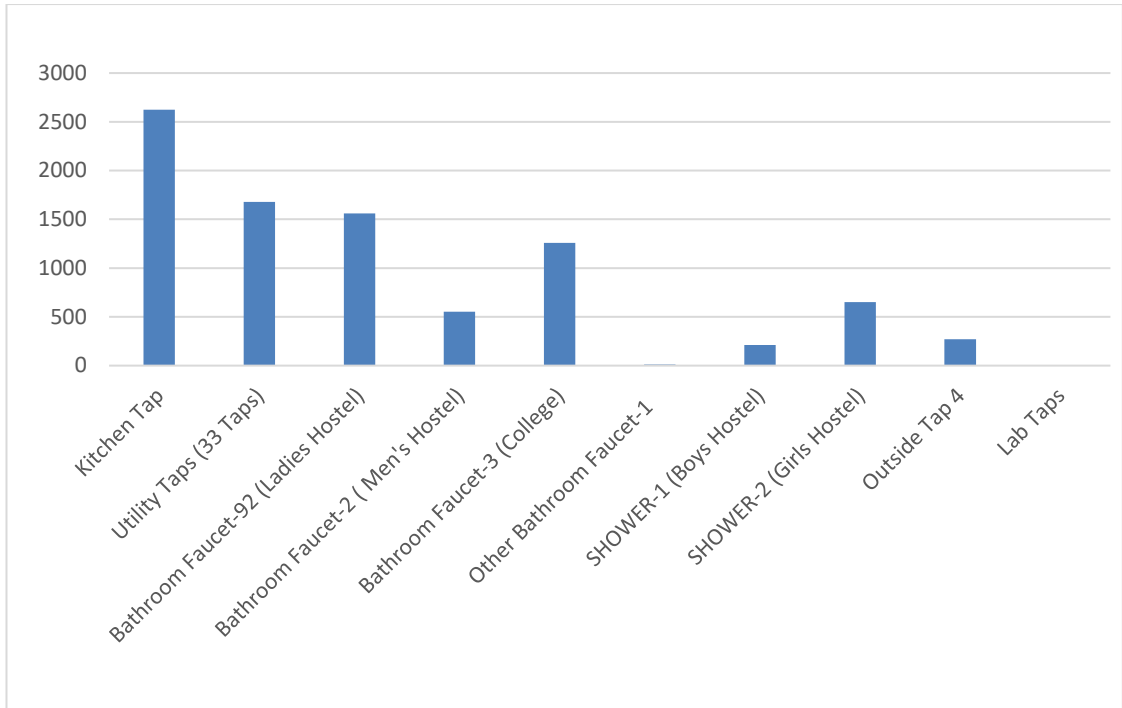
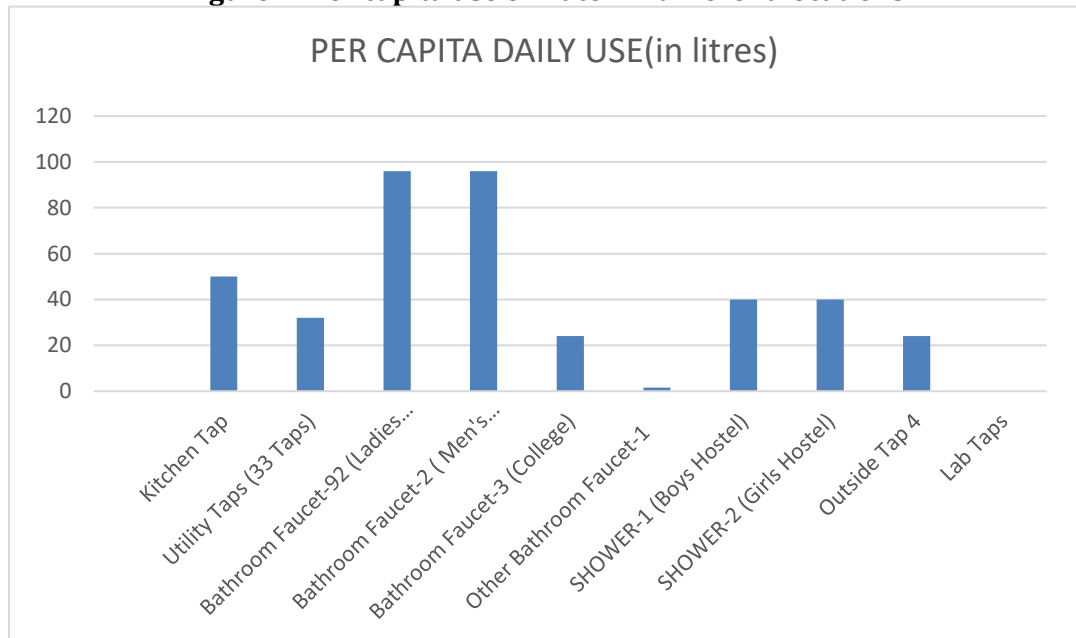


Figure 1: Comparison on average time of use of various water outlets in the college

Figure 2: Per capita use of water in different locations



6.7 Comparative Analysis on Previous audit data with current data

WATER AUDIT

The highest quantity of per day water usage was observed in kitchen taps and hostel showers. Formerly it was boy's hostel showers and kitchen tap usage were comparatively less. Interestingly, the average time of water outlet use is more at kitchen and that was more at ladies hostel formerly. During the former as well current audit, the least duration of water usage was noted at other bathroom faucets. The highest per capita use of water was observed in ladies and men's hostel, but it was more at ladies hostel during the past audit. While considering the daily usage of water, more water was used during this audit period, i.e., 33596L than the former one, 29869L. This is because of the increase in the number of residents in the hostel. There are 20 water tanks in the college with a total capacity of 31000 litres (same as the past situation). However, the total quantity of water pumped a day was increased now, it is 48000L and that was 41000L earlier. The loss of water through leakage in the campus is also estimated. There was only one tap which is leaking now, previously it was 3, this change in leakage tap saved 30L of water per day. Earlier 45L of water was wasted due to leakage, but now it is reduced to 15L. The amount spent for electricity that used for pumping motors and pumps were also estimated. It was found that on an average Rs. 2616.58 earlier, but now it is increased to Rs. 3378.96. This is because of the usage of water for construction of new building in the premise.

6.8 CONCLUSIONS & RECOMMENDATIONS

The water audit is an effective method to assess the water usage pattern and estimate the quantity the used in the college. Besides, it provides scientific measures to improve the water conservation preventing the water loss and lazy usage habits.

The water audit conducted in the Loyola college campus revealed that the water usage pattern in the college is moderate and there is very little loss of water taking place in the college due to leaking or bad infrastructure.

The highest use of water is in kitchen. Hence, proper water conservation measures should be implemented in the kitchen. The per capita use of water is not up to the expected international standards (WHO - 40 litre/head minimum; 70 lit./head minimum as per Indian standards- National Water Authority/ KWA). The per capita usage of water consumption in the college is 40.36 litres/ head. This may be because of the significant percentage of days scholars, who have been using water for bathing and washing at their homes. Considering this point, we can reduce the per capita use of water even more and conserve water.

The per capita usage of water and the duration of water consumption are the highest in ladies' hostel during the audit in 2014. It was recommended that some habitual change and usage pattern. As part of this, when students take admission in the hostel, they are instructed for the proper and responsible use of water. The leaders of the hostel also monitor this. They are instructed to fill one bucket water before bath and use it.

The water is properly managed and preserved, Leakages are monitored and repaired on time. The students are keeping regular vigil on water usage and methods such as generating awareness of water conservation through banners and posters. Need for regular discussions among the group members for bringing new methods and ways for conserving water in and around the campus.

7. ENERGY AUDIT

7.1 INTRODUCTION

The purpose of an energy audit is to account for consumption and recommend where savings are possible. A 'walk through audit' or 'site survey' involves sighting every light and piece of equipment that consumes energy, recording power ratings and estimating hours of operation. Obvious energy waste and inefficiencies are noted, as are items in need of maintenance or replacement. An action plan for energy management strategy can be formulated as a result of the audit.

For planning of new and refurbished buildings, an audit can comprise an assessment of all proposed energy consuming equipment, which in turn enables the preparation of an energy budget. The energy audit of the Loyola college campus was done with these objectives and to develop an energy management plan for the college.

7.2 AIM

To conduct an energy audit of the Loyola college campus and suggest conservation measures

7.3 OBJECTIVES

- To assess the existing pattern of electrical energy use in the college campus
- To find out the routes of energy loss
- To suggest and implement an energy conservation programme

7.4 METHODOLOGY

The energy audit was done through a walk-through survey to the nook and corners of the college campus in multiple recurring sessions. The process started in January 2020. Orientation was given to the students but later due to lock down we could not continue it. The second phase was on 9th February 2021 and third phase was on 22nd November 2021.

Though it was planned in advance, due to Covid-19 pandemic and lockdown students were not available in the campus. In the second phase, on 9th February 2021, at 9.00 a. m, all students gathered in the Sutter Hall for a common meeting. Students were divided into four groups and all the groups conducted energy audits and they toured the college campus during the period January 2020- November 2021.

At the beginning they collected a scaled map of the college campus and divided the whole area into six segments and assigned with 5-7 students.

7.4.1 SITE SURVEY

Student volunteers explored their assigned area on three working days, three Saturdays and three holidays (Sundays). Every day they toured the area in three sessions – one hour before the classes begin; before and after noon interval (lunch break); and one hour after the last class session ends. For each location, they recorded the number of lamps, the types of lamps (incandescent or fluorescent or CFL or LED), and the power rating of lamps (number of Watts) and estimated the daily hours of usage by visiting rooms throughout a typical day or asking staff. The same procedure repeated for equipment's, instruments and other electrical installations. A batch of students took the Energy Meter readings of the college regularly on all site survey days and at the same daily sessions.

The billing data of the college also collected (of past three years) for it will provide a good picture of how much total energy is used and how consumption varies throughout the year.

7.5 RESULTS AND OBSERVATIONS

Table 6: Outdoor Lighting in the Loyola College campus

Location no	Type	Use	Tree cover	No of light points	Power	Average hourly use/day	Units used/Day	Units used/Week	Units used/Year
R1	Main college road	To light up the road	Moderate	3	9	12	0.324	2.268	118.26
R2	Behind of college building	To light up the area"	Moderate	4	9	12	0.432	3.024	157.68
R3	In front of the College building (from gate)	To light up the area	Poor	6	9	12	0.648	4.536	236.52
R4	GYM	To light up the area	Moderate	1	9	12	0.108	0.756	39.42
R5	Canteen	To light up the area	Moderate	1	9	12	0.108	0.756	39.42
R6	Hostel	To light up the area	Moderate	2	9	12	0.216	1.512	78.84
Total Units used							1.836	12.852	670.14

Table 7: Indoor Lighting in the Loyola College campus

Location No	Type	Construction Type	Windows/dors/Skylight/paint	No of light points	Nos.	Power	Hours of use	Units used/day	Units used/week	No. of days used in an year	Units used per year	
C1	Class room	Class room	Concrete	5windows/1 door/rich/clean	8 classes 2 tube light 20w	5	7	7	0.245	1.225	120	29.40
C2	Sutter hall	Conference	Baker model	6 ventilation/10 door/rich/no paint	Tube light T10	3	40	2	0.24	0.72	120	28.80
					Tube light T5	12	28	2	0.67	2.016	120	80.64
					Tube Light LED	1	20	2	0.04	0.12	120	4.80
					CFL Bulb	4	16	2	0.13	0.384	120	15.36
					MH Light	8	250	2	4.00	12	120	480.00
C3	Jose Muricken	Conference	Concrete	5w/1d/rich/clean	20 LED 9w	20	9	2	0.36	1.44	120	43.20
C4	Men's hostel	Residence	Concrete	40 rooms 2w/1d each. Poor/ clean	40 Tube X20	40	20	8	6.40	44.8	180	1152
C5	Ladies hostel	Residence	Baker model	Same	LED 135x9	135	9	8	9.72	68.04	180	1749.6
					CFL 49x16	49	16	8	6.27	43.904	180	1128.96
					Zero Bulbs 5x0.5	5	0.55	8	0.02	0.154	180	3.96
					T10 16x28	16	28	8	3.58	25.088	180	645.12
					T5 23x20	23	20	8	3.68	25.76	180	662.4
C6	Computer System Room	Computer	Concrete	2w/1d/poor	3 tube 20w	3	20	8	0.48	2.4	180	86.4
C7	Library	Reading	Concrete	16w/1d/rich/clean	43 x 28 LED tube light	43	20	6	5.16	30.96	180	928.8
C8	Canteen	Mess hall	Concrete	14w/10d/rich/clean	15 tube 20w, 6x20w LED	15	20	3	0.90	5.4	230	207
Total Units Used								85.805	540.025	2510	15587.8	

Table 8: Electrical gadgets and their energy use in the Loyola College campus

Location no	Type	Equipment	Usage pattern	Power rating	Nos	Power	Average hourly use/day	Units used/day	Units used/week	No of avg. days of use in a year	Units used/year
L1	Men's Hostel	1.Laptop	Mostly during evenings	28 x35w	28	35	8	7.84	54.88	200	1568
		2.Speakers		3 x 20w	3	20	4	0.24	1.68	200	48
		3.Emergency light		1x80 w	1	80	2	0.16	1.12	180	28.8
		4.Torch		1 x1.5w	1	1.5	1	0.00	0.0105	285	0.4275
		5.Ceiling fan		1x100w	1	100	1	0.10	0.7	120	12
		6.Table fan		39x 50w	39	50	8	15.60	109.2	180	2808
		7. Iron Box		1x1000w	1	1000	2	2.00	12	180	360
		8. Mobile charger			39	4	2	0.31	2.184	180	56.16
L2	Canteen	1.Blender	Daily in the canteen kitchen	1 x 750w	1	750	1.5	1.13	7.875	250	281.25
		2.Fridge		1 x 260w	1	260	24	6.24	43.68	250	1560
		3.Grinder		1 x 360w	1	360	2	0.72	4.32	250	180
		4. Water Heater-1		1*3000w	1	3000	3	9.00	54	250	2250
		5. Exhaust-2		1*30w	2	30	9	0.54	3.24	250	135
		6.Mixer-1		1*500w	1	500	0.3	0.15	0.9	250	37.5
		7. Coconut Grinder-1		1*150w	1	150	0.3	0.05	0.27	250	11.25
		8. Cooler-1		1*200w	1	200	24	4.80	28.8	250	1200
		9. Freezer-2		2*350w	2	350	24	16.80	117.6	250	4200
		10. Water Purifier-1		1*60w	1	60	24	1.44	10.08	250	360
L3	College main building	1.Computer, CPU Desktop)	Every working day	15x200	15	200	7	21.00	126	290	6090
		1.Computer, CPU Desktop)	Every working day,	25x200w	25	200	2	10.00	70	180	1800
		2.Printer	occasionally	4x240v	4	240	0.4	0.38	2.688	290	111.36
		3.Stereo	During functions,	1x100w	1	100	2	0.20	1.4	90	18
		4.Aqua guard		2x50w	2	50	12	1.20	3.6	285	342
		5.LCD TV	Class hour	1x120w	1	120	5	0.60	3	285	171

		6. Centralized AC	Acc. to need	1x3500w	1	3500	0.15	0.53	1.575	90	47.25
		7. Projector		10x200w	10	200	6	12.00	60	180	2160
		8. Photostat machine	Acc. to need	2x8.220w	2	220	0.3	0.13	0.66	160	21.12
		9. Ceiling fan		67x75w	67	75	5	25.13	125.625	180	4522.5
		10. fax		1x240v	1	240	0.05	0.01	0.012	5	0.06
		11. Public Addressing system-1	Acc. to need	1 x30w	1	30	0.05	0.00	0.0015	285	0.4275
		12. UPS	Charging Current	2*3.5KW	2	1000	2	4.00	28	365	1460
		13. UPS Library		2*5KW	2	1000	2	4.00	12	365	1460
L4	Sutter hall	1. Ceiling fan		9x70w	9	70	2	1.26	3.78	90	113.4
		2. Ceiling Fan BLDC	Functions during program	4*32W	4	32	2	0.26	0.768	90	23.04
		3. Wall fan		2*80W	2	80	2	0.32	0.96	90	28.8
		4. Sound system and Mic Wired		1*300W	1	300	2	0.60	1.8	90	54
L5	Chapel	1. Fan	During service	5*75W	5	75	1	0.38	30	365	136.875
		2. Mic wired		1*300W	1	300	1	0.30	30	365	109.5
		3. Speaker		2*100W	2	100	1	0.20	30	365	73
L6	Library	1. Camera		8*15W	8	15	24.0	2.88	25	200	576
		2. Biometric system		1*12W	1	12	8.0	0.10	30	200	19.2
		3. Computer		15*200W	15	300	1.0	4.50	25	200	900
		4. Computer		2*250W	2	300	7.0	4.20	25	200	840
		5. Camera monitoring screen		1*35W	1	35	8.0	0.28	25	200	56
		6. Server-Digital Library System		1*300W	1	300	24.0	7.20	25	200	1440
		7. Fan - BLDC		3*30W	3	30	8.0	0.72	25	200	144
		8. Wall fan		5*40W	5	40	3.0	0.60	25	200	120
		9. Printer		1*340W	1	340	0.2	0.05	25	200	10.2
		10. Photostat machine		1*340W	1	340	0.2	0.07	25	200	13.6
		11. AC Dual inverter		1*1740W	1	1740	8.0	13.92	25	200	2784
		12. Speaker set		1*5W	1	5	1.0	0.01	25	200	1
		13. Exhaust Fan		6*40W	6	40	0.5	0.12	25	12	1.44

L7	Loyola Ladies Hostel	1. FAN	Evening	47x75	47	75	0.5	1.76	25	180	317.25
		2..Laptop	All day	75x35w	75	35	0.5	1.31	25	180	236.25
		3.Water cooler	During powercut	1x50w	24	285	0.5	3.42	30	365	1248.3
		4.Inverter &lighting		2x1500v	24	1500	0.3	10.80	30	365	3942
		5. Iron Box		4x1000w	4	1000	2	8.00	30	180	1440
		6. Electric Kettle		2x1200	2	1200	0.3	0.72	30	365	262.8
		7. Induction Cooker		1x1200	1	1500	1	1.50	30	365	547.5
		8. Geyser		1x6000	1	6000	1	6.00	30	180	1080
		9. Fridge		1x150	1	150	24	3.60	30	365	1314
		10.Mobile Charger		75	39	4	2	0.31	30	180	56.16
		TOTAL								221.67	1604.41

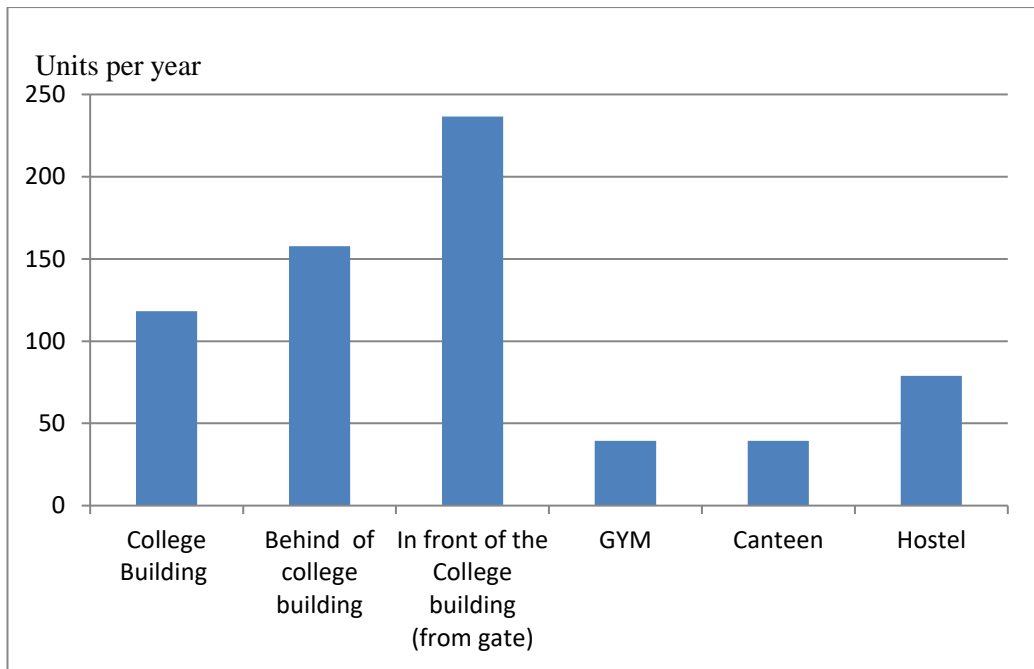


Figure 2: Pattern of outdoor electrical energy use

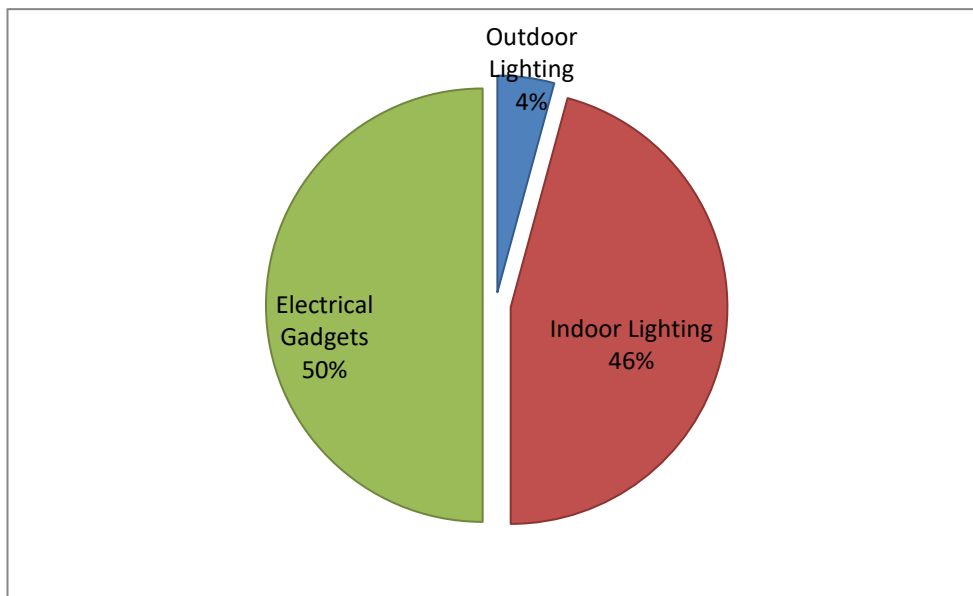


Figure 3: Pattern of energy use in various sectors

Table 9: Monthly Electricity Bill

Month	Ladies Hostel Con. No.970	Men's Hostel Con. No. 1190	Library-Con. No. 2253	Sutter Hall Cons. 1189	College Con. No. 2158	Total
November 2018	12312	24118	996	1966	4981	44373
December 2018	9729	0	0	0	3670	13399
January 2019	12367	21521	0	0	0	33888
February 2019	12022	0	990	2740	3298	19050
March 2019	13000	23538	990	2068	3473	43069
April, 2019	14140	0	4455	0	0	18595
May,2019	7903	19326	3164	1735	0	32128
June,2019	4709	0	990	0	1546	7245
July, 2019	9289	23424	2618	3107	3758	42196
August,2019	17858	0	0	0	4776	22634
September,2019	14634	25400	2495	4971	4718	52218
October,2019	12418	0	0	0	5526	17944
November,2019	11247	25263	3235	5009	6778	51532
December,2019	13857	0	0	0	8630	22487
January, 2020	12256	21813	2771	4849	6978	48667
February, 2020	12972	0	0	0	5377	18349
March, 2020	13115	24280	3252	4995	1954	47596
June, 2020	11412	0	0	0	2480	13892
July, 2020	0	5098	2136	1546	984	9764
August, 2020	0	0	0	0	980	980
September,2020	0	1994	0	0	975	2969
October, 2020	0	0	1479	1181	1058	3718
November, 2020	3778	6589	2279	1345	975	14966
December, 2020	0	0	0	0	1458	1458
January, 2021	3663	0	2213	2327	115	8318
February, 2021	13961	8427	0	0	2802	25190
March, 2021	13145	22675	3736	5112	1596	46264
April 2021	8814	0	0	0	2938	11752
May 2021	12424	15093	144	153	1148	28962
June 2021	11055	0	1560	1703	975	15293
July 2021	5302	6237	2338	0	975	14852

August 2021	3615	0	0	0	975	4590
September 2021	4058	7254	2338	2506	975	17131
October 2021	6911	0	0	0	2800	9711

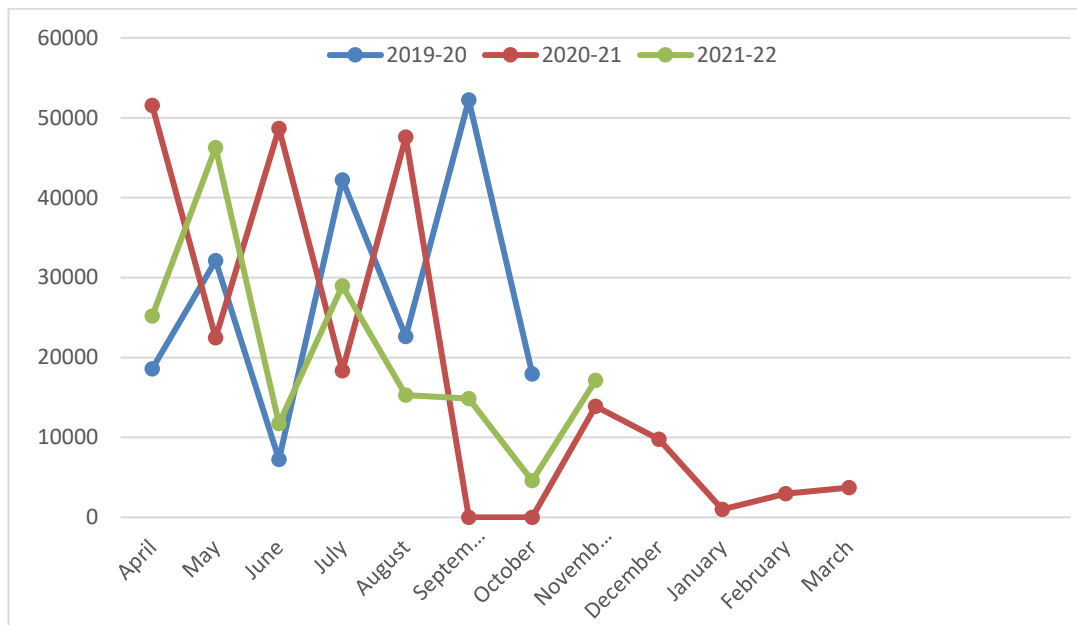


Figure 4: Monthly energy expenditure (in Rupees) of the Loyola college campus

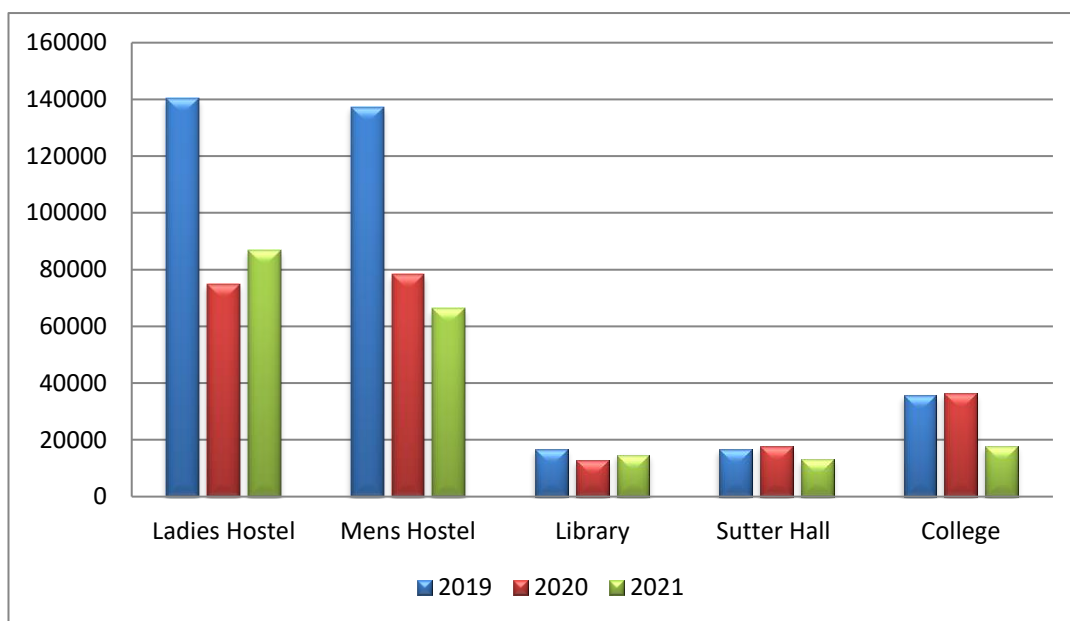


Figure 5: Yearly energy expenditure (in Rupees) of the Loyola college campus

The energy use and pattern of its use in the outdoor areas of the college (within the campus) is given in Table 6. A total of 670.14 units per year is the usage of electricity for outside lighting purpose. The location wise analysis of lighting expenses outside the buildings area showed that the highest use in front of the campus followed by the area behind the camps, followed by main college road, hostel. Hostel and canteen have same lighting expenses (Fig.3). A daily average use of 85.85 units of electricity was recorded inside the buildings for lighting purpose. (Table 7). The daily use of electricity for the working of various equipment's in the college accounts for 221.67 units and yearly it reaches up to 51188.42 units of electricity (Table 8). Naturally the highest use owes to equipments in the college (Fig.4).

The monthly electricity charge remitted to KSEB for the past three years showed that there is a regular monthly pattern of energy use in the college barring few exceptions (Table 9). The peak usage was found in September to November every year (Fig.5). The highest usage of electricity was in Ladies hostel and Men's Hostel. Men's hostel bill covers the canteen too.

Least usage of electricity is found in library, Sutter Hall followed by college buildings. (Fig.6). It is noted that there were no electricity bills in some (five) months in Ladies hostel, during Corona pandemic time, as the hostel was closed. The Kerala Electricity Board had issued the bills without checking taking into consideration of closing of hostel. Later this was brought into the notice of KSEB and rectified.

The per capita average energy consumption per year in the college is 67.37515 units per year (considering total number of students as 235).

7.6 Initiatives taken to make the campus energy efficient

Based on the suggestions given in the Green Audit of 2014, the college has taken following initiatives to make the campus more energy efficient.

1. **Installation of Solar system in the main college building.** There are 37 solar panel of size 5x3 ft. were installed. The total area covered is 555 sq. ft. The average energy produced is 67 units per day. The amount of electricity usage in the main building has decreased over the years, owing to the installation of solar panels. The whole building is run mostly on solar panels. We have made agreements with KSEB and also sell additional electricity through the grid.
2. **Green Policy:** The College has adopted green policy for decades and currently transforming the light system to LED as and when the existing CFLs get fused.
3. **Exposure cum Orientation visit to Energy Management Centre:** Every year, we arrange a one-day exposure cum orientation visit to State Energy Management Centre (EMC) who orients the students about energy efficiency and sustainability.
4. **Certificate Program in Energy Awareness:** Many of our students have done a short-term certificate programme on “**Learn to Design Your Own Solar System**” which enabled them to get a basic understanding of Energy, Power, Electricity Bill and Solar System. This was in collaboration with Energy Swaraj Foundation as part of Energy Literacy Drive.

7.7 Comparative Analysis on Previous audit data with current data

During the former audit at Loyola College by TIES the total energy usage at Outdoor area was 0.9 units per day and currently it is reduced to 0.44 units (per day) for lighting purposes. This reduction is due to the replacement of 3 CFL lights with LED lights. Yearly outdoor energy usage is 154.03 units now, but this was not the former situation the yearly consumption was 352.8 units. Hence the usage of LED bulbs and fittings should be promoted in order to save more energy. But in the case of day-to-day use equipments/appliances or machinery usage, there is no change in energy usage. i.e., the former as well as the current audit shows the same pattern of energy utilization, 16022 units per day. This is because two courses have started during this period and there is proportionate increase in the strength of the students. A daily average use of 16.605 units of electricity was recorded for lighting the indoor areas. This value is also reduced considerably, formerly it was 455.01 units per day. This may be due to the decrease in usage in the period of Covid 19 lockdown.

While considering the monthly electricity charge remitted to KSEB for the past 3 years, there is regular energy usage and the highest usage is seen at ladies' hostel, followed by Mens' hostel and least at the College. Electricity bill of 5 areas were considered, Ladies Hostel, Men's Hostel, Library, Sutter Hall and College. The peak usage was seen during the period October to November. Formerly the highest energy usage was at Ladies hostel followed by college buildings and least at Men's hostel. And peak usage was noticed during the period January to April. There is drastic increase in energy usage at Men's hostel. Former electricity bill of Men's Hostel shows that Rs.1,91,734 was paid as a whole (3 years), but now it is Rs. 2,82,050. This is because the electricity bill of canteen is also included in this bill. Due to increase in the strength of students, certain electronic gadgets like freezer, geyser, grinder etc. were added during this period. A drastic decrease is noticed at the college area owing to the installation of solar energy panels. During the former audit period there was no LED lights in the college campus and there was 21 CFL lights. The current audit shows that 18 CFL lights were replaced with LED lights.

7.8 CONCLUSION AND RECOMMENDATIONS

The energy audit of the Loyola College revealed that the highest energy use in the college is in Ladies hostel and Canteen and Men's hostel, followed by main college buildings. This usage is mainly owing to the usage of ceiling fans. The usage pattern of ceiling fans of the ladies hostel also significantly contributes to the high cost of electricity. The age and condition of fans also should be checked. This should be regulated and significant reduction is possible. It is suggested that replacing of old fans with Brushless Direct Current Motor (BLDC) in future.

Though there are significant decrease in energy usage in equipment's and instruments, it is recommended to use five star rated equipments in cases that are possible. Though there is practice of Energy Conservation Education campaign should be conducted in the college covering all staffs, students and teachers, it should be done periodically.

Biodiversity audit



Castanospermum australe

8.1 Introduction

Biodiversity audit comprises the observations and findings of rapid biodiversity assessment of Loyola college of social science campus and highlights the current status of flora and fauna, best practices observed and recommendations for better management.

The campus maintains considerable composition of vegetation, despite of developmental activities. Considering the ecological importance of the region improvement in terms of restoration with suggested native vegetation are recommended. Moreover, the healthy practice of retaining large trees and vegetation in the campus irrespective of the landscape alterations is noteworthy.

The geographical settings, and natural tranquillity of the campus support appreciable biodiversity and moreover, the Loyola philosophy of 'environmental consciousness' augments campus biodiversity. Viable recommendations were also made through the audit. It is expected that the proper implementation of the suggested restoration activities and continuation of the best practices will enrich the biodiversity and ecological stability towards an ideal eco-friendly and sustainable campus.

As part of the green audit, biodiversity assessment was carried out, mainly focussing on the vegetation composition and faunal components, found in the college campus. The observations and recommendations are expected to contribute important inputs to the administration for the better management of its natural ecosystems, micro-habitats and biodiversity conservation of the campus. It will be helpful for the sustainable management and maintenance of healthy environment.

8.2 Objectives

- To identify the floral and faunal diversity of the Loyola college campus
- To impart scientific temperament and culture among the students through participatory biodiversity surveying
- To propose suggestions to enhance biodiversity of the college campus

8.3 Methodology for Biodiversity Assessment

The biodiversity assessment team along with the campus inmates, as a group conducted a detailed exploration in the campus. Standard protocols were followed for the assessment of faunal and floral components. Focal animal sampling, visual encounter method, point count and visual estimation, transect walk etc. are the

specific assessment methods followed. Individual species of trees, shrubs, herbs, climbers, garden species; alien and exotic species were noted and categorised into native species, garden as well as introduced species and the invasive-exotic species. Photographs were taken in certain cases for identification and confirmation of species. A systematic survey of fauna was carried out by direct observations and indirect evidences. Information from campus residents was also considered for certain species. Regional flora and authentic field guides were used for the identification.

8.4 Results and Observations

Table 10: Floral Diversity of Loyola College Campus

Sl no.	Scientific name	Common name	Malayalam name	Habit	Diversity Cited
Endemic					
1	<i>Artocarpushirsutus</i>	Aini	Anjili	Tree	15
2	<i>Trichopuszeylanicus</i>	Arogyapacha	Arogyapacha	Herb	2
3	<i>Gardenia gummifera</i>	Gandharaja	Gandharaja	Herb	2
Exotic					
4	<i>Allamandacathartica</i>	Allamanda	Kolambichedi	Shrub	25
5	<i>Castanospermum australe</i>	Chestnut	Pachira	Tree	1
6	<i>Hyptissuaveolens</i>	Hyptis	Sheemathulasi	Herb	15
7	<i>Clitoriaternatea</i>	Gokarni	Shangupushpache di	Herb	15
8	<i>Tridaxprocumbens</i>	Tridax	Odiyan	Herb	10
9	<i>Ribusgrossularia</i>	EuroeanGoosbery	SeemaNelli	Tree	2
10	<i>Pouteriacampechiana</i>	canistel	muttapazham	Tree	1

11	<i>swietenemahogani</i>	Mahogany,Cuban / west Indian	<i>Mahogani</i>	Tree	65
12	<i>Kalanchoepinnata</i>	Life Plant	<i>Ilamulachi</i>	Herb	5
13	<i>Psidiumguajava</i>	Guava	<i>Pera</i>	Tree	8
14	<i>Annonasquamosae</i>	Custard Apple	Seethapazham	Tree	4
15	<i>Polyalthialongifolia</i>	Devadaru	Aranamaram	Tree	35
16	<i>AchrasZapotalinn</i>	Chicle	Sapota tree	Tree	6
17	<i>Gliricidiamaculata</i>	Madre Tree	Sheemakonna	Tree	9
18	<i>Delonixregia</i>	Gulmohur	Alasipoomaram	Tree	5
19	<i>TalinumTriangulara</i>	Water leaf	Sambarcheera	Herb	15
20	<i>Averrohacarambola</i>	Star fruit	Anapulinch	Tree	2
21	<i>Chrysophyllumcainitoverigata</i>	Star Apple	Nakshathranelli	Tree	2
22	<i>Eugenia javanica</i>	Thailand Rose apple	chamba	Tree	3
23	<i>Chromolaenaadorata</i>	Communist pacha	Communist pacha	Shrub	Infinite
24	<i>Passiflorafotida</i>	Stinging passion flower	Poochapazham	Climber	1
25	<i>Piper colubrinum</i>	Pepper vines	Mara kurumulagu	Climber	4
26	<i>Lantana camara</i>	Lantana	Poochedi	Shrub	12
27	<i>Albiziasaman</i>	Rain tree	Chakkarakayamar am	Tree	2
28	<i>Albizialebeck</i>	Dirris tree	Vagamaram	Tree	12
29	<i>Codiaeumvariegatumpictum</i>	Croton plant	Croton	Shrub	26
30	<i>Bougainvillea spectabilis</i>	Bougainvillea	Kadalaschedi	Shrub	14
31	<i>Caladium hortulanum</i>	Fancy caladium	Chitrachembu	Shrub	10
32	<i>Mussaendaerythrophylla</i>	Mussaenda	Mussaenda	Tree	4

33	<i>Anthuriumandraeanum</i>	Anthurium	Anthurium	Shrub	15
34	<i>Oxalis latifolia</i>	Indian red sorrel	Puliyarila	Herb	Infinite
35	<i>Peltophorumpterocarpum</i>	Copper-pod	Charakonna	Tree	6
36	<i>Vernonia</i>	Curtain plant	Curtain plant	Climber	5
37	<i>Prunusbuleis</i>	Almond	Badam	Tree	11
38	<i>Epiprenumaureum</i>	Money plant	Money plant	Epiphyt e	4
39	<i>Adehatherapavonia</i>	Red lucky seed	Manjadi	Tree	2
40	<i>Caricapappaya</i>	Pappaya	Karumoos	Tree	7
41	<i>Haveabrasiliensis</i>	Rubber	Rubber	Tree	12
42	<i>Flacoartiaceae</i>	Red gooseburry	Lolika	Tree	1
43	<i>Avarohacarambola</i>	Star fruit	Aanapulinji	Tree	2
44	<i>Rhychostylisretusa</i>	Foxtail orchid	Foxtail orchid	Herb	1
45	<i>Epidendrum</i>	Epidendrum orchid	Orchid	Herb	1
46	<i>Dendrobiumkingianum</i>	Dendrobium orchid	Orchid	Herb	1
47	<i>Caesalpiniaapulcherrima</i>	Peacock flower	Rajamalli	Tree	4
48	<i>Averrohabilimbi</i>	Bilimbi	Irumbanpuli	Tree	1
49	<i>Codiaeumvariegatum</i>	Garden Croton	Croton	Shrub	33
50	<i>Chrysanthamumpulchella m</i>	Pulchellam	Pulchellam	Shurb	4
51	<i>Aloe vera</i>	Alovera	Kattarvazha	Herb	5
52	<i>Garciniamangostana</i>	Mangosteen	mangosteen	Tree	1
53	<i>Autocarpusaltilis</i>	Bread fruit	Sheemachakka	Tree	1
54	<i>Pimentadioica</i>	All spices tree	All spices tree	Tree	1
55	<i>Dendrobiumcumailatumk ranzi</i>	Dove orchid	Dove orchids	Herb	1

56	<i>Nepheliumjappaceum</i>	Rambutan	Rambootan	Tree	1
57	<i>Bauhinia verigata</i>	Bauhinia	Mandharam	Tree	1
58	<i>Annonareticulata</i>	Red custard apple	Anamunthiri	Tree	4
59	<i>Poranopsispaniculata</i>	Bridal bouquet	Bridal bouquet	Herb	3
60	<i>Acalyphaindica</i>	Acalypha	Kuppaimeni	Shrub	2
61	<i>Daturastramonium</i>	Jimson weed	Ummam	Shrub	1
62	<i>Muchlenbekiplatyclados</i>	Tapeworm plant	Ribbon plant	Herb	3
63	<i>Rueillatuberosa</i>	Wild petunia	Ruellia	Shrub	2
64	<i>Tradescantiaspathacea</i>	Oyster Plant	tradescantia	Shrub	3
65	<i>Annonamuricata</i>	Graviola	Mullathi	Tree	4
66	<i>Adenocalymaaliseae</i>	Garlic vine	Pambuveretti	Shrub	2
67	<i>Callistemon linearis</i>	Narrow leaved bottlebrush	bottlebrush	Shrub	3
68	<i>Tecomastans</i>	Yellow bells	Ponnarali	Shrub	3
69	<i>Rubiaccordifolia Lin</i>	Torch wood tree	Manjatti	Tree	3
70	<i>Aralia balfouriana</i>	Dinner plate aralia	Aralia	shrub	2
71	<i>Heliconiarostrata</i>	Hanging Lobster Claw	Vazhachedi	Shrub	6
72	<i>Bixaorellana</i>	Annatto	Chenchayamaram	Tree	2
73	<i>Parkiabiglandulosa</i>	African locust tree	Badminton ball tree	Tree	4
74	<i>Araucaria heterophylla</i>	Conifer	living Christmas tree	Tree	4
75	<i>Ananascomosus</i>	Pineapple	Kaithachakka	shrub	25
76	<i>Fittoniaverschaffeltii</i>	Mosaic plant	Nerve plant	Herb	2
77	<i>Malpighia emarginata</i>	West Indian Cherry	Cherry	Tree	1

78	<i>Vaccinium oxycoccos</i>	Cranberry	Lovelolica	Tree	2
79	<i>Phyllanthus niruri</i>	Jarmala	keezharnelli	Herb	Infinite
80	<i>Punica granatum</i>	Pomegranate Red	chemmMathalam	Shrub	1
81	<i>Justicia gendarussa burm</i>	Black vasu	vathamkolli	shrub	4
82	<i>Etilingera elatior</i>	Torch Ginger	Pambukolli	Herb	2
Native					
83	<i>Morinda citrifolia</i>	Indian Mulberry	Noni	Tree	2
84	<i>Musa paradisiaca</i>	Plantain	Vazha	shrub	24
85	<i>Albizia odoratissima</i>	Black Siris	Kunnivaka	Tree	5
86	<i>Coccoloba nucifera</i>	Coconut	<i>Thengu</i>	Tree	12
87	<i>Ixora coccinea</i>	Ixora	Thetty/chetti	Herb	25
88	<i>Andrographis paniculata</i>	King of bitters	Kiryath	Herb	2
89	<i>Lingoumsantalinum</i>	Red Sandal wood	Raktha Chandhanam	Tree	1
90	<i>Syzygium cumini</i>	Plum tree	Njaval	Tree	5
91	<i>Tabernaemontana divaricata</i>	Crape Jasmine	Kurudipala	Shrub	11
92	<i>Pterocarpus marsupium</i>	Malabar Kino	Venga	Shrub	8
93	<i>Manjifera indica</i>	Mango	Maavu	Tree	14
94	<i>Azadirachta indica</i>	Neem tree	Aaryaveppu	Tree	9
95	<i>Tectona grandis</i>	Teak	Teak	Tree	40
96	<i>Tamarindus indica</i>	Tamarind tree	Pulimaram	Tree	10
97	<i>Citrus medica, aurantium var.</i>	Citron	Ganapathinarakam	Herb	2
98	<i>Garcinia cambogia</i>	Gamboge Tree	Kudampuli	Tree	3
99	<i>Manihot utilissima</i>	Cassava	kappa	Herb	32
100	<i>Sapota achras</i>	Sapodilla	Sapotamaram	Tree	4

101	<i>Plumbagoindica</i>	Cape Leadwort	Chethikoduveli	Herb	3
102	<i>Prunusavium</i>	Sweet Cherry	Cherry	Shrub	2
103	<i>Saracaasoca</i>	Asoka Tree	Ashokam	Tree	26
104	<i>Cinnamomumzeylanicum</i>	Cinnamon	Karuvapattamaram	Tree	2
105	<i>Sansevieriaroxburghiana (sps)</i>	Bowstring hemp	sarppapola	Shrub	4
106	<i>Bamboosaglaucophylla</i>	Bamboo	Mula	Shrub	11
107	<i>Swieteniamahagani</i>	Mahagoni	mahagani	Tree	86
108	<i>Phyllanthusemblica</i>	Leaf flower	Indian Gooseberry	Tree	4
109	<i>Chrysalidocarpuslutescens</i>	Yellow palm plant	Pana	Shrub	12
110	<i>Hymenocallisscaribea</i>	White Spider lilly	White lilly	Shrub	5
111	<i>Ficuscomosa</i>	Garden ficus	Velal	Shrub	5
112	<i>Bambusaarundinaceae</i>	Thorny bamboo	Illimula	Tree	3
113	<i>Lippianodiflora</i>	Lippia	Kattutippali	Climber /herb	3
114	<i>Clerodendruminfortunatum</i>	Clerodendrum	Peruvalam	Shrub	65
115	<i>Macarangapeltata</i>	Purina plant	Poriyani	Shrub	8
116	<i>Ficusnitida</i>	Indian laurel fig	Atthi	Tree	3
117	<i>Cassia fistula</i>	Indian laburnum	Kanikonna	Tree	3
118	<i>Moringaoleifera</i>	Drum stick tree	Muringa	Tree	6
119	<i>Murrayakoenigii</i>	Curry leaf tree	Karivepilamaram	Tree	5
120	<i>Cardiospermumhalicacabum</i>	Kanphuti	Uzhinja	Herb	3

121	<i>Artemisia pallens</i>	Dhavanam	Marukuzandu	Herbs	2
122	<i>Dracaena afromontana</i>	Dragon tree	Dracaena	Tree	11
123	<i>Azadirachta indica</i>	Neem	Veppu	Tree	9
124	<i>Andrographis panicwata</i>	Kiriyath	kiriyath	Shrub	3
125	<i>Tectonagrandis</i>	Teak	Thekk	Tree	34
126	<i>Ixoracoccinea</i>	Jungle flame	Thechi	Shrub	4
127	<i>Allamandacathartica</i>	Yellow bell flower	Kolambi	Shrub	40
129	<i>Gelsemiumsemperrirens</i>	Wild jasmine	Kattumulla	Shrub	3
130	<i>Ixorapavetta</i>	White ixora	Vellathechi	Shrub	33
131	<i>Pteridophyta</i>	Fern	Pannalchedi	Shrub	27
132	<i>Magnolia chempaka</i>	Chempaka	Chempakam	Tree	2
133	<i>Calanthesylvatica</i>	Calanthe orchid	Orchid	Herb	19
134	<i>Emilia sanchifolia</i>	Lilac tasselflower	Muyalchevi	Herb	Infinite
135	<i>Ocimumtenuiflorum</i>	Rama thulasi	Rama thulasi	Herb	4
136	<i>Delonixregia</i>	Royal Poiciana	Gulmohar	Tree	5
137	<i>Ficusbengalensis</i>	Bengal fig	Aalmaram	Tree	9
138	<i>Prunusdulcis</i>	Almond	Badam	Tree	15
139	<i>Ciriodendron</i>	Tulip tree	Tulip tree	Tree	2
140	<i>Cassia fistula</i>	Golden shower tree	Kanikonna	Tree	5
141	<i>Hibiscus rosa-sinensisverigata</i>	Hibiscus	Chemparathi	Shrub	3
142	<i>Nerium oleander</i>	Nerium	Arali	Shrub	5
143	<i>Amaryllis belladonna</i>	Naked lady	Amaryllis	Shrub	3
144	<i>Sasa fortune</i>	White bamboo	Mula	Shrub	8

145	<i>Sphaeranthusamaranthoides</i>	Garden lavender	Keshavardhini	Herb	1
146	<i>Asparagus racemosus</i>	Asparagus	Sathavari	Herb	3
147	<i>Piper longum</i>	Bengal pepper	Thippali	Climber	1
148	<i>Marantaarundinacea</i>	Arrow root	koova	Tuber	4
149	<i>Eugenia jambas</i>	Rose apple	Panineerchamba	Shrub	1
150	<i>Alpiniaacalcaratarox</i>	The greater galangal	Chittaratha	Herb	2
151	<i>Kaempferiagalanga Linn.</i>	Aromatic Ginger	Kacholam	Herb	2
152	<i>Elephantopusscaber Linn.</i>	Elephant's foot	Anachuvadi	Herb	3
153	<i>Centellaasiatica Linn.</i>	Indian pennywort	Kudangal	Herb	Infinite
154	<i>Paprika</i>	Paprika plant	Undanmulaku	Shrub	1
155	<i>Hedychiumcoroparium</i>	Garland flower	Kalyanasauganthikam	Herb	5
156	<i>Erva - de - santamaria</i>	Erva	Ayarva	Herb	3
157	<i>Justiciacarnea</i>	Water willow	Justicia	Shrub	2
158	<i>Zorinagibbosa</i>	Zorina	Murukutti	Herb	6
159	<i>Plectranthusambionicus</i>	Indian borage	Panikoorka	Herb	8
160	<i>Eremochloaophiuroides</i>	Centipede grass	Pazhutharakolly	Herb	1
161	<i>Vetiverzizaniodes</i>	Vetiver	Ramacham	Herb	4
162	<i>Adhathodabeddomeiclark e</i>	Malabar nut	Aadalodakam	Shrub	1
163	<i>Cissusquadrangularis</i>	Devil's backbone	Asthisamharaka	Herb	3
164	<i>Tinosporacordifolia</i>	Giloy	Amruthavalli	Herb	2
165	<i>Cinnamomumzeylanicum</i>	Cinnamon	Karuvapatta	Tree	3
166	<i>Cynadondactylon</i>	Bhama grass	Karukapullu	Herb	6

167	<i>Osimum sanctum</i>	Thulasi	Thulasi	Herb	21
168	<i>Dracaena deremensis</i>	Dracaena compacta	Dracaena	Shrub	2
169	<i>Ficusbenjamina</i>	Benjamin's fig	Aal	Shrubs	2
170	<i>Hibiscus rosa-sinensis</i>	Snowflake	Chemparathi	Shrub	4
171	<i>Boutelouadactyloides</i>	Buffalo Grass	Erumapullu	Herb	Infinite
172	<i>Dendrocalamusstrictusnees</i>	May bamboo	kallumula	Tree	2
173	<i>Phalarisarundinacea</i>	Phalaris	Ribbon grass	Herb	Infinite
174	<i>Alocasia Amazonica</i>	Kris Plant	Alocasia	Shrub	3
175	<i>Aeglemarmelos</i>	Stone apple tree	Koovalam	Tree	2
176	<i>Piper betle</i>	Bettle	Vettila	Creeper	3
177	<i>Jetrophamultifida</i>	Coral bush	karukolpatta	shrub	3
178	<i>Lagerstroemia reginae</i>	Tamhan	Poomaruthu	Tree	4
179	<i>Spondiasmangifera</i>	Hog Plum	Ambazhanga	Shrub	2
180	<i>Calliandracalothyrsus</i>	Thuja	Thuja	Shrub	5
181	<i>Couroupitaguianesis</i>	Canon ball tree	Naagalingamaram	Tree	1
182	<i>Artocarpusintegrifolia</i>	Jack Tree	Plavu	Tree	15
183	<i>Cassia biflora</i>	Cassia biflora	Konna	Tree	10

Table 11: Faunal Diversity of Loyola College Campus

Sl. No.	Scientific name	Common Name	Malayalam Name	Number spotted
1.	<i>Euphlectishexadactylus</i>	Green Frog	Pacha Thavala	10
2.	<i>Bufo parietalis</i>	Toad	Chorianthavala	50
3.	<i>Eurymerodesmus</i>	Millepede	Atta	Infinite
4.	<i>Lithobiusforficatus</i>	Brown Centipede	Pazhuthara	Infinite
5.	<i>Ptyas mucosa</i>	Rat snake	Chera	10
6.	<i>Bungaruscaeruleu</i>	Krait	Vellikketan	2
7.	<i>Oecophyllasmaragdina</i>	Red ants	Urumbu	Infinite
8.	<i>Camponotuspennsylvanicus</i>	Black Carpenter ants	Kattuurumbu	Infinite
9.	<i>Dinopium bengalensis</i>	Black-rumped Flame back	Maramkotthi	4
10.	<i>House crow -corvus splendens</i>	Crow	Kakka	50
11	<i>Nectarinia minima</i>	Crimpson - backed sunbird	cher then kili	2
12	<i>Herpestesedwardsii</i>	Mongoose	Keeri	8
13	<i>Achatinoidea</i>	Snail	Ocche	Infinite
14	<i>Anisoptera</i>	Dragon fly	Thumbi	Infinite
15	<i>Perionyx excavates</i>	Earth worm	Mannira	Infinite
16	<i>Orioluskundoo</i>	Eurasian golden oriole	Indinmanjakilly	
17	<i>Caelifera</i>	Grass hopper	Pullchadi	Infinite

18	<i>Cuculuscanorus</i>	Cuckoo	Koel	10
19	<i>Canis lupus</i>	Dog	Patti	7
20	<i>Felis domesticus</i>	Cat	Poocha	4
21	<i>Daboia russelii</i>	Russels viper	Anali	2
22	<i>Apis indica</i>	Honey bee	Then eecha	Infinite
23	<i>Ropalidiamarginata</i>	Wasp	Kadhanal	Infinite
24	<i>Psittaculakrameri</i>	Parrot	Thatha	More than 35
25	<i>Lampropholiguichenoti</i>	Common garden skink	Arana	Infinite
26	<i>Polypedates maculatus</i>	Indian tree frog	Mara thavala	14
27	<i>Chrysopeliaornata</i>	Flying snake	Komberly	2
28	<i>Lycodonaulicus</i>	Shanghuvaraya n	Churuta	4
29	<i>Meropsorientalis</i>	Gren bee eater	Pacha kili	2
30	<i>Chamaeleozeylanicus</i>	Chameleon	Aonthu	48
31	<i>Centropus sinensis</i>	crow pheasant bird	Chemboth	2
32	<i>Culicidelongiareolata</i>	Mosquitos	kothuku	infinite
33	<i>Drosophila melanogaster</i>	Drosophila	pazhaeacha	infinite
34	<i>Musca domestica</i>	house fly	eacha	infinite
35	<i>Acridotheres tristis</i>	Myna	myna	11
36	<i>Hemidactylus frenatus</i>	Wall Lizards	Palli	Infinite
37	<i>Calotes versicolor</i>	Garden Lizard	Palli	21
38	<i>Achatina fulica</i>	African giant snail	African ochu	32
39	<i>Melanoplus differentials</i>	Grass Hopper	Pullchadi	infinite
40	<i>Mantis religiosa</i>	Praying mantis	Thozhumprani	40
41	<i>Hemiptera</i>	Bugs	mootta	40
42	<i>Sciurus carolinensis</i>	Squirrel	annan	10
43	<i>Rattus rattus</i>	Rats	eli	40

44	<i>Pardoxurus hermaphoditus</i>	Asian palm civet	marapatti	2
45	<i>Periplaneta americana</i>	American cockroach	Paata	15
46	<i>Chiroptera</i>	Bat	Vaval	4
47	<i>Tapimonamelanocephalum</i>	Odor ant	Urumbu	Infinite
48	<i>Microchiroptera</i>	Indian Flying Fox (Fruit Bat)	Vaval	15
49	<i>Formica japonica</i>	Black ants	urumbu	Infinite
50	<i>Argiope anasuja</i>	signature spider	Chilanthi	10
51	<i>Spodoptera exigua</i>	Common cutworm/beet Army worm	Vira	75
52	<i>Pterostichus melanarius</i>	Sidewalk Carabid	Kari vandu	Infinite
53	<i>Delias eucharis</i>	Common jezebel	VilasiniSalabham	10
54	<i>Cirrochroathaisthais</i>	Tamil yeoman	MarottiSalabham	10
55	<i>Tirumala limniaceexoticus</i>	Blue tiger	neelakaduva	15
56	<i>Danaus chrysippuschrysippus</i>	Plain Tiger	Erickuthappi	10
57	<i>Hypolimnas bolina jacintha</i>	Great egg fly	vanchottashalabham	10
58	<i>Columba livia</i>	Rock dove	pravu	10
59	<i>Cheiracanthium</i>	Yellow sac spider	Vella chilanthi	10
60	<i>Euploca core core</i>	Common indian crow	aralishalabham	20
62	<i>Cuculus micropterus</i>	Indian cuckoo	vishupakshi	4
63	<i>Chloropsis cochinchin</i>	Blue winged leaf bird	Nadanilakili	10
Other reported faunal citations				
64	<i>Coracias benghalensis indica</i>	Indian roller	Pananmkaka	

65	<i>Antusnovaeseelandiamalynsis</i>	Paddy field pipit	Vayalvaramban	
66	<i>Alcedotaprobana</i>	common kingfisher	Ponman	
67	<i>Aegithina tiphia multicolour</i>	common lora	Ayora	
68	<i>Passer domesticus indicus</i>	House sparrow	angadikuruvi	
69	<i>Corvus macrorhychosculminatus</i>	large billed crow	belikakka	
70	<i>Micropternusbrachyurusjerdonii</i>	Rufouf wood pecker	chembanmaramkothi	
71	<i>Meropsleschenaulti</i>	Chestnut headed bee eater	chenthalayanvellitha	
72	<i>Hypspotesmadagascariensis</i>	Black bulbul	karimban bulbul	
73	<i>Nectarinia asiatica</i>	purple sun bird	karuppan ten kili	
74	<i>Nyctormsatthertona</i>	blue bearedbee eater	kattuvethitha	
75	<i>Nectariniazeilonick</i>	purple rumped sunbird	manja ten kili	
76	<i>Dynopiambenghalense</i>	Black rumpedflameback	nattumaramkothi	
77	<i>Pycnonotuscafercafer</i>	Red vented bulbul	Nattu bulbul	
78	<i>Psittaculakramerimanillensis</i>	Rose ringed parakeet	Nattuthatha	
79	<i>Psittaculacolomboidas</i>	Blue winged parakeet	Neelathatha	
80	<i>Phalacrocrox niger</i>	Little cormorant	Neerkaka	
81	<i>Dendrocittavagahundaparvula</i>	Rufous tree pie	Olenjali	
82	<i>Hersiliasaviglyspacelucas</i>	Tree spider	Mara chilanthi	

83	<i>Peucetiaviridans</i>	Green lynx spider	Pachilachilanthi	
84	<i>Plexippussctipes</i>	Spider	Chilanthi	
85	<i>Robin copsycluscelylonensis</i>	Oriented magpie	mannathi	
86	<i>Herpestesjavanicus</i>	Indian Mongoose	Keeri	
87	<i>Conocephalusupoluensis</i>	Greenish Meadow Katydid	Pulchadi	
88	<i>Chorthippuscurtipennis</i>	Marsh Meadow Grasshopper	Kariyilavittil	
89	<i>Rhagonycha fulva</i>	Common Red Soldier Beetle	Ilatheenivandu	
90	<i>Lampyridae</i>	Lightning Bugs	Minna minni	
91	<i>Tenebrionidae coleoptera</i>	Luprops beetle	Chelli	
92	<i>Orthetrumchrysis.</i>	Red Marsh Hawk Dragonfly	Chumannathumbi	
93	<i>Neoscona rumpfi</i>	Thorell	Chilanthi	
94	<i>Zizinaotis indica</i>	Lesser grass blue	cherupulneeli	
95	<i>Surendra quercetorumbiplagiata</i>	Common acacia blue	acacia blue	
96	<i>Aeromachus pygmaeus</i>	Pygmy grass hopper	kattupulchadan	
97	<i>Suastusgremiusgremius</i>	Indian palm bob	panankurumban	
98	<i>Heteropodavenatoria</i>	Cane spider	Bheemanchilanthi	
99	<i>Distoleontetragrammicus</i>	Antlion	Kuzhiyana	
100	<i>Trihabdaflavolimbata</i>	Leaf beetles	Vandu	
101	<i>Coptotermesformosanus</i>	Termites	Chithal	
102	<i>Pyrrharctiaisabella</i>	wooly bears	moth	

103	<i>Spodoptera liturafabricius</i>	Armyworm/ cluster Caterpillar	Vira	
104	<i>Zophobasmorio</i>	Super Worm Factoids	Vira	
105	<i>Trades minons</i>	southern bird wing	Garuda Shalabham	
106	<i>Papilioclytiaclytia</i>	Common mime	Vazhanapoombatta	
107	<i>Papiliodemoleusdemoleus</i>	Lime butterfly	Narakasalabham	
108	<i>Papiliopolymnestorpolymnestor</i>	Blue murmon	Krishna shalabam	
109	<i>Catopsiliapomonapomona</i>	Common emigrant	Manhathakaramut hi	
110	<i>Euremahecabehecabe</i>	Common grass yellow	Manhapaappathi	
111	<i>Euremabrigitta rubella</i>	Small grass yellow	Cherumanhapaapp athi	
112	<i>Euremablandasilhetana</i>	Three spot grass yellow	MupottanPaappath i	
113	<i>Lethe drypetistodara</i>	Tamil tree brown	Marathavidan	
114	<i>Orsotriaenamedusmandata</i>	Nigger	Karuppan	
115	<i>Acracaviolac</i>	Tawny coster	Pullychemban	
116	<i>Pareronia hippie hippia</i>	Common wanderer	Naadodi	
117	<i>Charaxes solon solon</i>	Black rajah	Puliyilashalabham	
118	<i>Phalantaalcippiemercea</i>	Small leopard	Cherupulithayyan	
119	<i>Neptishylasvarmona</i>	Common sailer	Ponthachutta	
120	<i>Athymarangakarwara</i>	Blackvein sergeant	Ottavarayan sergeant	
121	<i>Limenitis procris</i>	Commanter	Vellilathozhi	
122	<i>Euthaliaaconthiameridionalis</i>	Common baron	Kanithozhan	
123	<i>Tanaecaaletideamigana</i>	Grey count	Pezhala	

124	Junonia almanac almana	Peacock pansy	mayilkanni	
125	<i>Tirumala septentrionisdravidarum</i>	Dark blue tiger	karineelakaduva	
126	<i>Chiladespandavapandava</i>	Plains cupid	nattumaran	

Table 12: density of organisms estimated through quadrate analysis

SL no	ORGANISMS	QUADRATES											
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
1.	Spider	2	-	-	-	2	-	4	-	-	2	-	3
2.	Buffalo Grass	42	36	40	29	-	--	--	-	-	80	50	-
3.	Snake grass	6	8	-	6	7	-	10	13	6	-	-	9
4.	Termites	5	-	-	7	45	-	-	65	-	-	-	-
5.	Black ants	12	7	5	15	8	4	6	-	12	33	-	-
6.	Earth worms	2	-	-	2		1	-	2	-	-	1	1
7.	Marsh meadow grasshopper	-	1	-	-	2	-	1	-	-	2	-	-
8.	Signature spider	2	-	-	1	-	-	2	-	-	2	-	1
9.	Red soldier beetle	-	-	2	-	3	-	-	4	-	-	2	-
10.	Red ants	5	6	6	-	20	3	10	20	9	-	-	10
11.	Dragonfly	5	1	-	-	-	-	1	-	8	-	2	-
12.	Leaf beetles	-	2	5	-	3	-	4	-	-	2	-	2
13.	Herbs	-	6	-	3	10	-	3	-	-	5	-	-
14.	Mosaic plant	4	-	-	-	-	-1	-	2	-	-	-	-
15.	Garland flower	-	-	-	2	-	-	-	-	1	-	-	-
16.	Yellow bell flower	-	2	-	-	3	-	-	-	-	-	-	-
17.	Greenish meadow cattytid	3	-	-	-	-	-	-	4	-	-	-	-
18.	Indian borage	-	-	2	-	4	--	-	-	4	-	-	-
19.	Long Grass	-	5	-	9	20	-	50	-	2	20	-	-
20.	Cockroach				2						2		
21.	Mula	2	-	-	-	2	-	4	-	-	-	-	-
22.	Grass hopper	2	-	-	1	-	-	-	-	-	-	-	1
23.	Jarmala	-	-	2	-	3	-	-	4	-	-	2	-
24.	Kiriyath	5	-	-	7	5	-	-	8	-	-	-	-
25.	Life plant	-	2	5	-	3	-	-	-	-	2	-	-
26.	Lightning Bugs	6	8	-	6	7	-	4	13	6	-	-	9
27.	Mist Grass	4	-	-	-	-	-	-	2	-	-	-	-
28.	Odor ants	-	1	-	-	-	-	-	4	-	-	12	-

29.	Small Black ants	4	-	-	17	-	14	-	-	15	-	-	20
30.	Yellow sac spider	3	-	-	-	-	-	-	4	-	-	-	-
31.	Worms	-	-	2	-	4	--	-	-	-	-	-	-
32.	Bhama grass	20	-	-	-	12	-	18	-	-	2	-	-
33.	Creeper	-	-	4	-	3	-	-	-	2	-	-	-
34.	Flies	-	-	-	-	-	-	-	4	-	-	12	-
35.	Snail	-	2	-	4	-	-	-	-	4	-	-	2
36.	Black carpenter ants	-	2	-	-	3	-	-	-	-	2	-	-
37.	Fern	3	-	-	-	-	-	-	4	-	-	-	-
38.	Antlion	-	-	2	-	4	--	-	-	-	-	-	-
39.	Praying mantis	-	2	-	2	3	-	-	2	1	2	-	-
40.	Black Carpenter ants	-	-	4	-	3	-	-	-	2	-	4	-
41.	Indian pennywort	-	2	5	-	3	-	-	-	-	2	-	-
42.	Indian red sorrel	2	-	-	-	-	-	-	-	1	2	-	-
43.	Millepede	2	-	-	-	-	-	-	2	-	-	-	-
44.	Rama thulasi	-	2	-	-	-	-	-	1	-	-	-	2
45.	Red Marsh Hawk Dragonfly	4	-	-	-	-	-	-	-	-	-	-	-
46.	Sidewalk Carabi	-	-	-	2	-	-	-	-	1	-	-	-
47.	Slug	-	2	-	-	3	-	-2	-	-	-5	-	-
48.	Vathamkolli	-	2	2	-	3	-	3	-	-	2	-	-
49.	Toad	-	-	-	-	-	-	2	-	-	-	-	-
50.	Telegraphic plant	-	1	-	-	-	-	-	-	-	-	-	-
51.	asparagus	2	-	-	-	-	-	-	2	-	-	-	-
52.	Garland plant	-	2	-	-	-	-	-	1	-	-	-	2
53.	mosquitos	-	6	-	-	-	12	-	-	5	-	-	-
54.	Neem (saplings)	-	-	-	1	-	-	1	-	-	-	-	-
55.	Anthurium	2	-	-	-	-	-	-	-	3	-	-	-
56.	Garland plant	-	-	-	-	-	-	-	-	2	-	-	-

8.5 Discussion

The vegetation composition of the Loyola college of social science campus mainly includes exotic and native plants podocarps and a good number of garden species. Being a small campus, the limitation of space is restricting greenery. However, a planned effort to make green the nook and corners of the campus will definitely improve the diversity at all levels. The floral diversity is moderately rich; however, it can be improved by adding more native species (recommended list of native trees given below).

In the less intervened portions of the campus where one can see the growth of trees, shrubs, herbs and creepers together form secondary vegetation in the area. It would pave way for further succession of vegetation if left untouched. With the increase of human population and associated infrastructure, it is obvious that the current vegetation components are mostly planted or introduced varieties. While allowing the saplings of natural pioneer species to come up, few native grass species such as *Vetiverazizanooides* (Ramacham) and suitable *Ochalandrasp.* may be planted to prevent soil erosion, particularly on the steep and sloppy areas.

Notable best practices can be identified at the Loyola college of social sciences campus. Every Wednesday is devoted for environmental activities and all the students are actively involving it. The activities are grouped into four namely, green campus, clean campus, water and energy and campus biodiversity. One student one tree programme is another notable initiative of biodiversity conservation in the campus. The natural environment of the Loyola college campus is appropriate for the habitat of stingless honey bees. There are more than 70 natural colonies of stingless honey bees maintained in the campus. The existing trees and plants of LCSS, and the vast farmlands of Central Tuber Crops Research Institute (CTCRI), provides all resources for the bee colonies expand. The bee hive initiative of LCSS focus on educating loyalties regarding the importance of bees/ stingless bees in maintaining the natural environment and the necessity for protecting them for their and human survival. The monitory profit of this initiative will be utilized for helping the needy. Recently the college was selected for Bhoomithrasena club, by

department of environment and climatic change, government of Kerala (order no: DOECC/E1/2704/2019 dated 25.09.2021).

8.6 Recommendations

- 1) Choose native trees and shrubs where ever it is required replanting.
- 2) Allow natural re-generation of the endemic and native species, particularly trees, wherever it is possible.
- 3) Grow up vegetable garden and medicinal garden and gradually develop it as a nursery.
Periodical and careful removal of exotic species, which are hindering the natural regeneration in the campus, should be monitored.
- 4) Practice Institutional Ecology- Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- 5) A more systematic survey including few experts should be conducted in the next phase.

Table 13: recommended native trees and shrubs for restoration activities

Sl. No.	Scientific name	Common name
1	<i>Persia macrantha</i>	Kulamavu
2	<i>Bombax ceiba</i>	Elavu
3	<i>Garcineacambogea</i>	Kudampuli
4	<i>Sterculia villosa</i>	Para Vakka
5	<i>Vernonia arborea</i>	Chamatha
7	<i>Dilleniapentagyna</i>	Pattipunna
9	<i>Grewia tiliifolia</i>	Unnam, Chadachi
10	<i>Alstoniascholaris</i>	Eazhilampala
11	<i>Holarrhenaantidysenterica</i>	Kudakapala
12	<i>Pavettabrevifolia</i>	Malampichi
13	<i>Tabernaemontanaheyneana</i>	Koonanpala
14	<i>Mimusopselengi</i>	Elanji
15	<i>Mimusopssp.</i>	Malaelanji
16	<i>Schleicheraoleosa</i>	Poovam

17	<i>Litsea coriacea</i>	Vettithali
18	<i>Rauvolfiaverticillata</i>	Amalpori
19	<i>Canna indica</i>	Canna lilly
20	<i>Ensetesuperbum</i>	Kalluvazha
21	<i>Cinnamomum verum</i>	Illvangam
22	<i>Smilax zeylanica</i>	Karivilanthivalli
23	<i>Argyreia nervosa</i>	Perunkurumpa
24	<i>Hydnocarpus macrocarpa</i>	Malamarotti

The campus maintains the considerable composition of vegetation, despite developmental activities. A total of 183 floral species (includes 3 endemic) and 126 species of fauna were reported in the current biodiversity audit. A slight diminishing trend was observed mainly due to the new construction of the academic buildings. A portion of the micro biodiversity spot in the Loyola campus- Daya park- is diverged for the development activity and consequently, species density is reduced accordingly. But the college management brings another notable initiative – the smrithivanam project- for the restoration of the floral diversity and is a success model now. The recommendations of this audit will enhance natural re-generation of the endemic and native species of the Loyola campus.

9. Conclusion

Overall, the list of species and the biodiversity composition of the Loyola college campus certainly shows an appreciable level of richness. A better understanding on the biodiversity of the Loyola college campus obtained through this survey. The campus maintains considerable amount of green cover, despite continuous ecological disturbances and degradation due to various developmental activities in the region.