



# GREEN AUDIT REPORT




## PAYYANUR COLLEGE PAYYANUR

Executed by



2023

  
**OTTOTRACTIONS**  
Energy - Engineering - Environment  
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# GREEN AUDIT REPORT

## PAYYANUR COLLEGE

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### PAYYANUR





Green Audit Report  
Payyanur College, Payyanur  
Report No: EA 1056/GA  
2023-August

### **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. Ottotractions is an ISO 9001-2015, ISO 17020-2012 and ISO 14001-2015 Certified organization, which ensures the quality of its services.*



## Acknowledgment

We were privileged to work together with the administration and staff of Payyanur College, Payyanur. We are grateful to them for the timely help extended to complete the audit and bringing out this report.

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

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

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

Thank you.

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

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## Preface

Educational institutions always had an important leadership role in society in demonstrating types of changes that used to occur with respect to the prime issues of the time. All around the world, educational institutions are taking steps to declare themselves the next carbon neutral school as a part of the global trend of becoming sustainable. In 2007, Victoria University School of Architecture and Design declared themselves the first carbon neutral campus in the world through the purchase of carbon credits. This concept is not a sustainable model as it does not guarantee the capture of carbon forever and also it is expensive.

The potential for any academic institution- (may be a school in a remote village or a university in an urban setting) - to become the driver for change is huge. Its role of practicing leadership in its community can be utilized to encourage and influence carbon neutral living.

The biggest factors that contribute towards emission are Energy, Transportation and Waste. Any reduction in the carbon emission by the above sectors, starts with the behavioral changes (Low cost) and/or technological investments (High cost). In order to make these changes, the students are to be educated properly on the concept of carbon neutral campuses and methods to reduce it.

In India, the concept of carbon neutral campuses is gaining momentum. Green Audit in Campuses measures the amount of Green House Gases (GHG) emissions produced as a result of its operations through an accounting like inventory of all the sources of GHGs and carbon sequestration in the school campus. Based on this, the total carbon footprint is estimated. Measures are recommended to bring down the carbon footprint of the campus and to make it a carbon neutral campus.

**B Zachariah**

**Director, OTTOTRACTIONS**

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# 1

# Introduction



## Background

All across the developed countries, educational institutions are now moving to a sustainable future by becoming carbon neutral and greener spaces. They are taking responsibility for their environmental impact and are working to neutralize those effects. To become carbon neutral, institutions are working to reduce their emissions of greenhouse gases, cut their use of energy, use energy efficient equipment, use more renewable energy, plant and protect green cover and emphasize the importance of sustainable energy sources. Institutions that have committed to becoming carbon neutral have recognized the threat of global warming and are therefore committing to reverse the trend. Studies on this line has not struck roots in most of the developing countries-especially among students.

The Sustainable Development Goals (SDGs), launched by the United Nations in 2015, are an excellent vehicle for driving this change. They represent an action plan for the planet and society to thrive by 2030. The SDGs provide a window of opportunity for creating multidimensional operational approaches for climate change adaptation. They address poverty, hunger and climate change, among other issues central to human progress and sustainable development, such as gender equality, clean water and sanitation, and responsible consumption and production.




The Green Audit of **Payyanur College, Payyanur** aims to assist campus to reduce their carbon footprint and educate tomorrow's leaders about strategies for carbon mitigation using their campus as a model. Also, this audit covers institutes responses towards SDGs by covering SDG 3,6,7,11,13,15. The green audit also aims to educate students and teachers on the concept of carbon footprint and to enable the students to collect data pertaining to the carbon emissions and carbon sequestration in their campus and to calculate the specific carbon footprint of the campus.

The project also suggests plans to make the campus carbon neutral or even carbon negative by implementing carbon mitigation strategies in areas such as,

- a. Energy
- b. Transportation
- c. Waste minimisation
- d. Carbon Sequestration etc.

The major objectives of the audit are:

- To make aware students and teachers on the concept of carbon footprint.
- To calculate the specific carbon footprint of the campus and classify it as carbon negative, neutral or positive.
- To create carbon mitigation plans to reduce their footprint based on the data generated.

## **PAYYANUR COLLEGE, PAYYANUR**

Payyanur College, Payyanur is one of the premier institutions of higher learning in Malabar, North Kerala. Currently affiliated to Kannur University, and re-accredited by the NAAC with 'B+' grade in 2018, this postgraduate college caters to the higher education needs of over 1800 students, most of whom hail from the economically-weak families of the rural areas around Payyanur. The college offers undergraduate courses in 14 disciplines, postgraduate courses in five and PhD Programmes in three. The establishment of the college in the village area of Edat in 1965 led to the materialization of the higher educational dreams of thousands of youngsters during

the past five decades. The college holds an enviably-high performance record in curricular and co-curricular activities.

<b>Occupancy Details</b>		
<b>Particulars</b>	<b>2021-22</b>	<b>2022-23</b>
<b>Total Students</b>	<b>1962</b>	<b>1939</b>
<b>Staffs</b>	<b>114</b>	<b>114</b>
<b>Total Occupancy of the college</b>	<b>2076</b>	<b>2053</b>

For calculating per capita carbon emission estimation, only the student strength is taken into account.



BASELINE DATA SHEET FOR GREEN AUDIT							
1	Name of the Organisation	Payyanur College, Payyanur					
2	Address (include telephone, fax & e-mail)	Payyanur, P.O Edat - 670327 Kannur Dt, Kerala, India payyanurcollege@rediffmail.com Ph No: 0497 2805121, 9497653521					
2	Year of Establishment	1965					
3	Name of building and Total No. of Electrical Connections/building	Payyanur College (7)					
4	Total Number of Students	Boys	593	Girls	1346	Total	1939
5	Total Number of Staff	114					
6	Total Occupancy	2053					
7	Total area of green cover	50%					
8	Type of Electrical Connection	HT	0	LT	7		
9	Total Connected Load (kW)	109					
10	Average Maximum Demand (KVA)	-					
11	Total built up area of the building (M <sup>2</sup> )	18286.23					
12	Number of Buildings	7					
13	Average system Power Factor	0.99					
14	Details of capacitors connected	Nil					
15	Transformer Details (Nos., kVA, Voltage ratio)	TR 1					
		0					
15	DG Set Details (kVA, )	DG1	DG2	DG3	DG4	DG5	Remarks
		62.5					
16	Details of motors	Rating		Nos.		Remarks	
		5 to 10		2			
		10 to 50					
		Above 50					
17	Brief write-up about the firm and the energy/environmental conservation activities already undertaken.	Installed biogas plant, Energy conservation projects, Installed 21.5kWp solar power plant. Rain water harvesting					
18	Contact Person & Telephone number	Dr. P.R. Swaran					
		9447293398					

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# 2

# METHODOLOGY



## 2.1. Sensitisation

Low Carbon campus initiatives are successful when everyone in the campus is engaged including students, teachers and staff. A team of students, teachers and staff were formed to participate in the audit. A sensitisation among students and teachers on the concept of carbon footprint was conducted.



During the audit the students and staffs were sensitised on the project and trained to be a part of the data collection team. This helped in conducting the survey in a participatory mode so that the awareness will penetrate to the grass root level. During the data collection field visit it was stressed that the team will spread these ideas to their homes and friends. This will help in a horizontal and vertical spread of the message to a wider group. It is assumed that through 2155 occupants of this campuses will reach same number of households. This message will spread to at least 8620 individuals approximately.

## 2.2 Estimation of carbon footprint

A carbon footprint is the amount of greenhouse gases—primarily carbon dioxide—released into the atmosphere by a particular human activity. A carbon footprint can be a broad measure or be applied to the actions of an individual, a family, an event, an organization, or even entire nation. It is usually measured as tons of CO<sub>2</sub> emitted



per year, a number that can be supplemented by tons of CO<sub>2</sub>-equivalent gases, including methane, nitrous oxide, and other greenhouse gases.

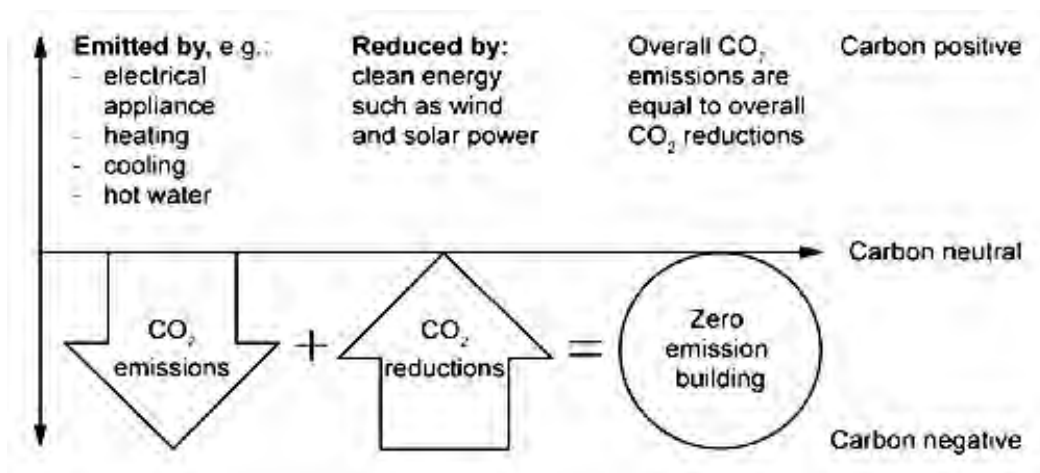
Global Warming Potential (GWP) is a measure of how much heat a greenhouse gas traps in the atmosphere up to a specific time horizon, relative to carbon dioxide. The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide (CO<sub>2</sub>).

Global Warming Potentials (IPCC Second Assessment Report)					
Species	Chemical formula	Lifetime (years)	Global Warming		
			20 years	100 years	500 years
Carbon dioxide	CO <sub>2</sub>	variable §	1	1	1
Methane *	CH <sub>4</sub>	12±3	56	21	6.5
Nitrous oxide	N <sub>2</sub> O	120	280	310	170
HFC-23	CHF <sub>3</sub>	264	9100	11700	9800
HFC-32	CH <sub>2</sub> F <sub>2</sub>	5.6	2100	650	200
HFC-41	CH <sub>3</sub> F	3.7	490	150	45
HFC-43-10mee	C <sub>5</sub> H <sub>2</sub> F <sub>10</sub>	17.1	3000	1300	400
HFC-125	C <sub>2</sub> HF <sub>5</sub>	32.6	4600	2800	920
HFC-134	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub>	10.6	2900	1000	310
HFC-134a	CH <sub>2</sub> FCF <sub>3</sub>	14.6	3400	1300	420
HFC-152a	C <sub>2</sub> H <sub>4</sub> F <sub>2</sub>	1.5	460	140	42
HFC-143	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	3.8	1000	300	94
HFC-143a	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	48.3	5000	3800	1400
HFC-227ea	C <sub>3</sub> HF <sub>7</sub>	36.5	4300	2900	950
HFC-236fa	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	209	5100	6300	4700
HFC-245ca	C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>	6.6	1800	560	170
Sulphur hexafluoride	SF <sub>6</sub>	3200	16300	23900	34900
Perfluoromethane	CF <sub>4</sub>	50000	4400	6500	10000
Perfluoroethane	C <sub>2</sub> F <sub>6</sub>	10000	6200	9200	14000
Perfluoropropane	C <sub>3</sub> F <sub>8</sub>	2600	4800	7000	10100
Perfluorobutane	C <sub>4</sub> F <sub>10</sub>	2600	4800	7000	10100
Perfluorocyclobutane	c-C <sub>4</sub> F <sub>8</sub>	3200	6000	8700	12700
Perfluoropentane	C <sub>5</sub> F <sub>12</sub>	4100	5100	7500	11000
Perfluorohexane	C <sub>6</sub> F <sub>14</sub>	3200	5000	7400	10700

The methodology for carbon footprint calculations are still evolving and it is emerging as an important tool for green house management. In the present study carbon emission data from the campus is estimated under four categories viz.

- a. Energy
- b. Transportation
- c. Waste minimisation
- d. Carbon Sequestration

**Carbon neutrality** refers to achieving net zero GHG emission by balancing the measured amount of carbon released into atmosphere due to human activities, with an equal amount sequestered in carbon sinks. It is crucial to restrict atmospheric concentrations of GHGs released from various socio-economic, developmental and life style activities using biological or natural processes. It is recognized that addressing climate change is not as simple as switching to renewable energy or offsetting GHG emissions. Rather, providing an opportunity for innovation in new developmental activities for viable and effective approach to address the problem.



## Energy

In the campus carbon emission from energy consumption is categorised under two headings viz. energy from Electrical and Thermal. Energy used for transportation is calculated under transportation sector.



A detailed energy audit is conducted to understand the energy consumption of the campus. Information on total connected loads, their duration of usage and documents like electricity bills are evaluated. Connected loads are calculated by conducting a survey on electrical equipment on each location. Duration of usage was found out by surveying the users. The survey of equipment was conducted in a participatory mode.

The fuel consumption for cooking, like LPG, was studied by analysing the annual fuel bills and usage schedules during the study. Discussions were carried out with the concerned individuals who actually operate the cooking system.

## Transportation

Carbon emission from transportation to be calculated by using the following formula:

Carbon Emission = Number of each type of vehicles × Avg. fuel consumed per year × Emission factors (based on the fuel used by the vehicle)

## Waste Minimisation

The waste generated from the campus is also responsible for the greenhouse gas emission. So, in order to calculate the total carbon foot print of the campus it is necessary to estimate the greenhouse gas emission from the waste generated in the campus by the activity of the students, teachers and staffs.

The calculation of the waste generated has been conducted by keeping measuring buckets for collecting the waste generated in a day. This waste so generated was calculated by weighing it.



## Carbon Sequestration

Carbon sequestration is the process involved in the long-term storage of atmospheric carbon dioxide. Trees remove carbon dioxide from the atmosphere through the natural process of photosynthesis and store the carbon in their leaves, branches, stems, bark, and roots.

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

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

Detailed calculations and results are given below.

### Step 1: Determine the total green weight of the tree

The green weight is the weight of the tree when it is alive. First, you have to calculate the green weight of the above-ground weight as follows:

$W_{\text{above-ground}} = 0.25 D^2 H$  (for trees with  $D < 11$ )

$W_{\text{above-ground}} = 0.15 D^2 H$  (for trees with  $D > 11$ )

$W_{\text{above-ground}}$  = Above-ground weight in pounds

$D$  = Diameter of the trunk in inches

$H$  = Height of the tree in feet

The root system weight is about 20% of the above-ground weight. Therefore, to determine the total green weight of the tree, multiply the above-ground weight by 1.2:

$W_{\text{total green weight}} = 1.2 * W_{\text{above-ground}}$



### Step 2: Determine the dry weight of the tree

The average tree is 72.5% dry matter and 27.5% moisture. Therefore, to determine the dry weight of the tree, multiply the total green weight of the tree by 72.5%.

$$W_{\text{dry weight}} = 0.725 * W_{\text{total green weight}}$$

### Step 3: Determine the weight of carbon in the tree

The average carbon content is generally 50% of the tree's dry weight total volume. Therefore, in determining the weight of carbon in the tree, multiply the dry weight of the tree by 50%.

$$W_{\text{carbon}} = 0.5 * W_{\text{dry weight}}$$

### Step 4: Determine the weight of carbon dioxide sequestered in the tree

CO<sub>2</sub> has one molecule of Carbon and 2 molecules of Oxygen. The atomic weight of Carbon is 12 (u) and the atomic weight of Oxygen is 16 (u). The weight of CO<sub>2</sub> in trees is determined by the ratio of CO<sub>2</sub> to C is 44/12 = 3.67. Therefore, to determine the weight of carbon dioxide sequestered in the tree, multiply the weight of carbon in the tree by 3.67.  $W_{\text{carbon-dioxide}} = 3.67 * W_{\text{carbon}}$



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# 3

# RESULTS AND DISCUSSIONS





## 3.1 CARBON FOOTPRINT ESTIMATION

### 3.1.1 ENERGY

#### a. Electricity

Electricity is purchased from KSEB under LT Connections, the details are given below.

<b>Electricity Connection Details</b>		
<b>Payyanur College, Payyanur</b>		
1	Name of the Consumer	Payyanur College, Payyanur
2	Tariff	LT-6A Ndom, LT-7B Ndom,LT-4A Ndom, LT-6B Ndom, LT-7A Ndom
3	Consumer Numbers	1166396000079, 1166396000080, 1166393001873, 1166394001043, 1166393000082, 1166390009225, 1166390015190
5	Connected Load Total (kW)	109
6	Annual Electricity Consumption (kWh)	45340

#### Electricity Bill Analysis

<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>78</b>	Consumer no		<b>1166396000079</b>	
Tariff		<b>LT-6A Ndom</b>		<b>Kunhimangalam</b>		
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	2479	5460	12395	2383	0	19095
May-22	973	5460	4865	487	0	10812
Jun-22	2325	5460	11625	1163	0	18248
Jul-22	2479	5460	12395	1600	0	19095
Aug-22	1912	5460	9560	956	0	15976
Sep-22	1694	5460	8470	847	0	14777
Oct-22	1823	5460	9115	912	0	15487
Nov-22	1859	5460	9295	930	0	15685
Dec-22	2988	5460	14940	1494	0	21894
Jan-23	1958	5460	9790	979	0	16229
Feb-23	2438	5460	12190	1219	0	18869
Mar-23	2479	5460	12395	1909	0	19095



<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>2</b>	Consumer no		<b>1166396000080</b>	
Tariff		<b>LT-6A Ndom</b>		Section		<b>Kunhimangalam</b>
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	33	120	165	17	17.7	319
Jun-22	4	120	20	2	17.7	160
Aug-22	20	120	100	10	17.7	248
Oct-22	19	120	95	10	17.7	242
Dec-22	86	120	430	43	17.7	611
Feb-23	73	120	365	37	17.7	539

<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>1</b>	Consumer no		<b>1166393001873</b>	
Tariff		<b>LT-7B Ndom</b>		Section		<b>Kunhimangalam</b>
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	0	120	0	0	17.7	138
Jun-22	0	120	0	0	17.7	138
Aug-22	2	120	10	1	17.7	149
Oct-22	8	120	40	4	17.7	182
Dec-22	1	120	5	1	17.7	143
Feb-23	102	120	510	51	17.7	699

<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>6</b>	Consumer no		<b>1166394001043</b>	
Tariff		<b>LT-4A Ndom</b>		Section		<b>Kunhimangalam</b>
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	1730	120	10380	1038	17.7	11556
May-22	2041	120	12246	1225	17.7	13608
Jun-22	429	120	2574	257	17.7	2969
Jul-22	663	120	3978	398	17.7	4514
Aug-22	493	120	2958	296	17.7	3392
Sep-22	548	120	3288	329	17.7	3755
Oct-22	531	120	3186	319	17.7	3642
Nov-22	487	120	2922	292	17.7	3352
Dec-22	704	120	4224	422	17.7	4784
Jan-23	366	120	2196	220	17.7	2553
Feb-23	441	120	2646	265	17.7	3048
Mar-23	544	120	3264	326	17.7	3728

<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>2</b>	Consumer no		<b>1166393000082</b>	
Tariff		<b>LT-6A Ndom</b>		Section		<b>Kunhimangalam</b>
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	0	120	0	0	17.7	138
Jun-22	1	120	5	1	17.7	143
Aug-22	0	120	0	0	17.7	138
Oct-22	0	120	0	0	17.7	138
Dec-22	0	120	0	0	17.7	138
Feb-23	0	120	0	0	17.7	138

<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>19</b>	Consumer no		<b>1166390009225</b>	
Tariff		<b>LT-6B Ndom</b>		Section		<b>Kunhimangalam</b>
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	1658	120	9948	995	17.7	11081
May-22	227	120	1362	136	17.7	1636
Jun-22	301	120	1806	181	17.7	2124
Jul-22	1329	120	7974	797	17.7	8909
Aug-22	1053	120	6318	632	17.7	7088
Sep-22	949	120	5694	569	17.7	6401
Oct-22	948	120	5688	569	17.7	6395
Nov-22	1335	120	8010	801	17.7	8949
Dec-22	1806	120	10836	1084	17.7	12057
Jan-23	1148	120	6888	689	17.7	7715
Feb-23	1469	120	8814	881	17.7	9833
Mar-23	1567	120	9402	940	17.7	10480

<b>Electricity Bill Details (2022-23)</b>						
Name of the Consumer		<b>Payyanur College, Payyanur</b>				
Connected Load (kW)		<b>1</b>	Consumer no		<b>1166390015190</b>	
Tariff		<b>LT-7A Ndom</b>		Section		<b>Kunhimangalam</b>
Month	kWh	Fixed charge (Rs)	Energy charge (Rs)	Duty (Rs)	Meter rent (Rs)	Total amount to be paid (Rs)
Apr-22	99	120	495	50	17.7	682
Jun-22	125	120	625	63	17.7	825
Aug-22	213	120	1065	107	17.7	1309
Oct-22	575	120	2875	288	17.7	3300
Dec-22	839	120	4195	420	17.7	4752
Feb-23	622	120	3110	311	17.7	3559

Annual Electricity Consumption (kWh)			
Consumer No	2021-22	2022-23	Connected Load (kW)
1166396000079	13907	25407	78
1166396000080	67	235	2
1166393001873	0	113	1
1166394001043	1200	5206	6
1166393000082	1	1	2
1166390009225	7659	11905	19
1166390015190	207	2473	1
<b>Total</b>	<b>23041</b>	<b>45340</b>	<b>109</b>

#### b. Diesel

Diesel Consumption Details				
	Transportation	Generator	Total	cost
	in L	in L	in L	in Rs
<b>21-22</b>	0	266	266	25000
<b>22-23</b>	1029	257	1286	125000

#### c. LPG

LPG Consumption Details		
	2021-22	2022-23
<b>No Cylinders</b>	129	133
<b>Canteen/Lab LPG Consumption in kg</b>	2457.3	2533.3
<b>Total in kg</b>	<b>2457.3</b>	<b>2533.3</b>



<b>Base Line Energy Data</b>			
<b>Payyanur College, Payyanur</b>			
		2021-22	2022-23
<b>1</b>	Electricity KSEB (kWh)	23041	45340
<b>2</b>	Electricity DG (kWh)	798	772
<b>3</b>	Electricity Solar , Off grid (kWh)	6867	6867
<b>4</b>	Electricity (KSEB + DG + Off grid) kWh	30705	52978
<b>5</b>	Electricity Grid Tied (kWh)	26289	27466
<b>6</b>	Diesel (L)	266	257
<b>7</b>	LPG (kg)	2457.33	2533.33
<b>8</b>	Biogas generated/year (kg)	412.50	247.50

<b>Energy Consumption Profile</b>			
<b>SI No</b>	<b>Fuel</b>	2021-22	2022-23
		<b>kCal</b>	<b>kCal</b>
<b>1</b>	Electricity	26406455	45561361
<b>2</b>	Diesel	2791662	13505865
<b>3</b>	LPG	29488000	30400000
<b>4</b>	Biogas	1925000	1155000
<b>Total</b>		<b>60611117</b>	<b>90622226</b>

<b>Thermal Fuel Consumption</b>		
<b>Payyanur College, Payyanur</b>		
	2021-22	2022-23
<b>Annual LPG consumption in kg</b>	2457.3	2533.3
<b>Annual Diesel consumption in L</b>	266	1286
<b>Annual petrol consumption in L</b>	0	0
<b>Annual Biogas consumption in kg</b>	412.50	247.50

### 3.1.2 Renewable Energy



**21.5kWp Solar Power plant**

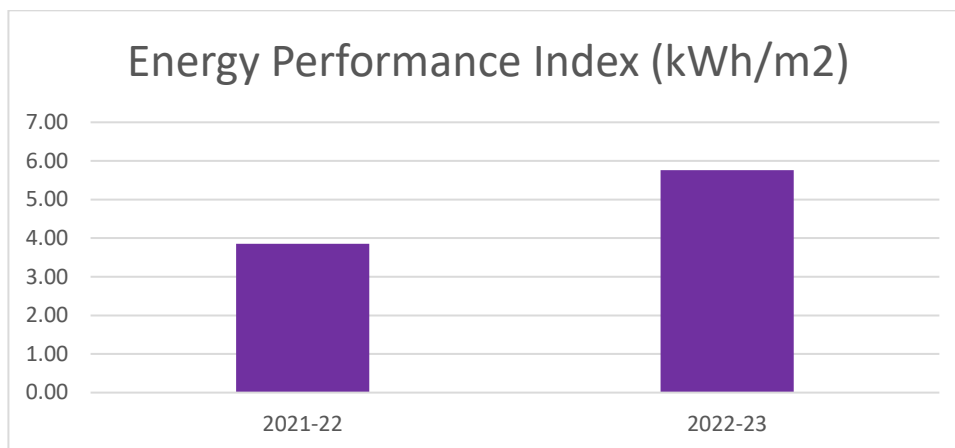
The installation of a 21.5kWp on-grid solar power plant in the campus is an exemplary initiative and one of the best practices adopted by the college. This solar power plant efficiently harnesses the abundant solar energy available, ensuring sustainable electricity generation. With an annual electricity generation capacity of 27466 units, this solar power plant not only meets a significant portion of the campus's energy needs but also helps in reducing the institution's carbon footprint. By mitigating approximately 22.87 tons of CO<sub>2</sub> emissions per year, the solar power plant plays a crucial role in promoting clean energy and environmental conservation within the college. It stands as a shining example of the college's commitment to renewable energy and serves as an inspiration for other institutions to follow suit.

<b>Solar Power Plant</b>		
<b>Capacity (kWp)</b>	<b>2021-22</b>	<b>2022-23</b>
	<b>Annual generation (kWh)</b>	
21.5	26289	27466

### 3.2 Specific Energy Consumption

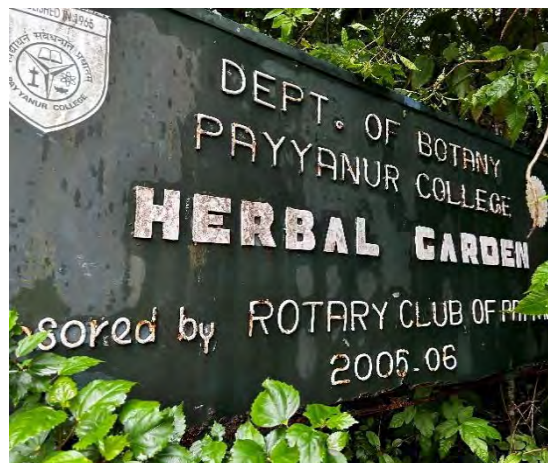
OTTOTRACTIONS- ENERGY AUDIT			
Payyanur College, Payyanur			
Energy Performance Index (EPI)			
SI No	Particulars	2021-22	2022-23
1	Total building area (m <sup>2</sup> )	18286.23	18286.23
2	Annual Energy Consumption (kCal)	60611117	90622226
3	Annual Energy Consumption (kWh)	70478	105375
4	Total Energy in Toe	6.06	9.06
5	Specific Energy Consumption kWh/m <sup>2</sup>	3.85	5.76

The specific energy consumption in 2022-23 may be taken as benchmark.



### 3.3. Waste Generation total

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.



### Degradable Waste

<b>Degradable Waste Generation</b>		
<b>Payyanur College, Payyanur</b>		
<b>Particulars</b>	<b>2021-22</b>	<b>2022-23</b>
<b>Total Occupancy</b>	2076	2053
<b>Waste generated in kg /day</b>	41.52	41.06
<b>Waste generated in kg /Yr</b>	9134.4	9033.2

### Non-Degradable waste

<b>Solid non degradable Waste Generation</b>		
<b>Payyanur College, Payyanur</b>		
<b>Particulars</b>	<b>2021-22</b>	<b>2022-23</b>
<b>Total Occupancy</b>	2076	2053
<b>Waste paper generated in kg /day</b>	0.4152	0.4106
<b>Waste plastic generated in kg /day</b>	0.6228	0.6159
<b>Waste paper generated in kg /Yr</b>	91.34	90.33
<b>Waste plastic generated in kg /Yr</b>	137.02	135.50

## 3.4. Transportation

The college have one Bus for logistics





### 3.5. Carbon Emission Profile (2022-23)

Carbon emissions in the campus due to the day-to-day activities are calculated and are discussed below. The emission factors considered for estimation and its units are given.

Emission Factors		
Item	Factor	Unit
Electricity	0.00082	tCO <sub>2</sub> e/kWh
LPG	0.0015	tCO <sub>2</sub> e/kg
Diesel	0.0032	tCO <sub>2</sub> e/kg
Petrol	0.0031	tCO <sub>2</sub> e/kg
Food Waste	0.00063	tCO <sub>2</sub> e/kg
Paper Waste	0.00056	tCO <sub>2</sub> e/kg
Plastic Waste	0.00034	tCO <sub>2</sub> e/kg

### Carbon Foot Print 2022-23

Carbon Foot Print					
Sl. No.	Particulars	2021-22	tCO <sub>2</sub> e	2022-23	tCO <sub>2</sub> e
1	Electricity (kWh)	30705	25.178248	52978	43.44
2	Diesel (L)	266	0.85	1286	4.12
3	LPG (kg)	2457.33	3.69	2533.33	3.80
4	Biogas (kg)	412.50	0.578	247.50	0.347
5	Degradable Waste in kg/yr.	9134.4	5.75	9033.2	5.69
6	Paper Waste in kg/yr	91.34	0.05	90.33	0.05
<b>Total Carbon Foot Print tCO<sub>2</sub>e/yr</b>			<b>36.10</b>		<b>57.45</b>

### 3.6. CARBON SEQUESTRATION

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

<b>Carbon Sequestration</b>		
<b>Particulars</b>	<b>2021-22</b>	<b>2022-23</b>
<b>Total No of Trees</b>	<b>481</b>	<b>481</b>
<b>Carbon sequestered by trees in the campus (tCO<sub>2</sub>e)</b>	<b>16.11</b>	<b>16.96</b>

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

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

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

## List of Trees in Campus

List of trees in campus		
Sl.No	Name of Trees	Number
1	Pattuthalli	2
2	ChuvannaCheeralam	2
3	Vetti	3
4	Anjili	4
5	Mootilpazham	2
6	Cholappunna	2
7	Karappa	5
8	Kattukaruva	2
9	Mullanpali	3
10	Kodavazha	5
11	Kattupunna	1
12	Karivella	2
13	Illakkatta	2
14	Kalpayin	3
15	Badraksham	2
16	Irumbarakki	1
17	Chalir	3
18	Chenkurinji	1
19	GonithalamuscadiopetalusBedd	1
20	Eeyakam	3
21	Irumbakam	6
22	Naduvalipongu	2
23	Humboldtiabrunoniana	2
24	Attuvanchi	5
25	Chorapayin	2
26	Marotti	6
27	Venthekku	3
28	Vellaadambu	1
29	Nangu	3
30	Palakapayyani	3
31	Poripoovam	2
32	Pali	1
33	Analivegam	7
34	Pulivayila	2
35	Nedunar	2
36	Ellootti	4

37	Pambukaimara	5
38	Kanakaitha	2
39	Tabernaemontanaheyneana Wall	1
40	Kattukadukka	6
41	Aluknumaram	1
42	Vellapayin	3
43	Adakkapayin	6
44	Moothasari	2
45	Thandidiyan	4
46	Attuchamba	2
47	Kollinjal	2
48	Kattuchamba	1
49	Njal	1
50	Ennapayin	2
51	ChuvannaAkil	5
52	Kattujathi	1
53	Kattujathi	1
54	Cherukoori	2
55	Koori	1
56	Nedunar	1
57	Kunukipanal	1
58	Nothopegiaheyneana	2
59	Asokam	4
60	Elenji	63
61	Poovam	1
62	Koovachekki	4
63	Desmoslawii	1
64	Vallimandaram	3
65	Swedapushpi	2
66	Jyothishmrithi	2
67	Mutharivalli	2
68	Erumathali	2
69	Odal	2
70	Pannivalli	2
71	Peral	1
72	Arayal	2
73	Athi	2
74	Thanni	4
75	Neermaruthu	4
76	Poomaruthu	10
77	Nelli	5
78	Ungu	7



79	Mavu	10
80	Plavu	2
81	Mahagony	20
82	Kumizhu	6
83	Mandaram	2
84	Njaval	4
85	Veppu	1
86	Kattadi	14
87	Asokam	3
88	Nukhamaram	7
89	Thekku	8
90	Pandham	2
91	Kuyittii	2
92	Koovalam	6
93	Kanikonna	5
94	Kaara	1
95	Garden Athi	2
96	India Badham	3
97	Lakshmitharu	3
98	Punna	1
99	Kulirmavu	1
100	Danthapala	2
101	Ankolam	1
102	Chenkurinji	1
103	Modiravally	1
104	Aaatha	1
105	Dhanthapaala	1
106	Kudagapaala	1
107	Palakapayyani	1
108	Mullanpaali	1
109	Pasakaimaram	1
110	Venkotta	1
111	Kattupunna	1
112	Punna	1
113	Kudampuli	1
114	Nagamaram	1
115	Thanni	1
116	Badam	1
117	Neermaruthu	1
118	Pattipunna	1
119	Vellakunthirikam	1
120	Vellapain	1

121	Beediyilamaram	1
122	Badraksham/Mukkanni	1
123	Eachil	1
124	Mootilpazham	1
125	Neeli	1
126	Mulluvenga	1
127	Sindoori	1
128	Arinelli	1
129	Nelli	1
130	Chuvannamandaram	1
131	Kanikonna	1
132	Katasokam	1
133	Ennapayin	1
134	Asokam	1
135	Pulimaram	1
136	Chamatha/Plasu	1
137	Venga	1
138	Rakthachandanam	1
139	Marotti	1
140	Chalirpazham/Lavaloika	1
141	Chalirpazham	1
142	Peenari	1
143	Mulakunaari	1
144	Kattukaruppa	1
145	Pezhu	1
146	Samudrakaya	1
147	Kaanjiram	1
148	Modakam	1
149	Tahthiri	1
150	Chempakam	1
151	Poovarasu	1
152	Katukasavu	1
153	Kayampoo	1
154	Veppu	1
155	Akil	1
156	Malaveppu	1
157	Kurangatti	1
158	Plavu	1
159	Anjili	1
160	Mavu	1
161	Peral	1
162	Athi	1

163	Arayal	1
164	Seemaathi	1
165	Ithi	1
166	Sarvasugandhi	1
167	Pera	1
168	Chamba	1
169	Njaval	1
170	Apple Chamba	1
171	Poochapazham	1
172	Malaelenji	1
173	Edala	1
174	Bilumbi	1
175	Carambola	1
176	Venkana	1
177	Kanali	1
178	Koovalam	1
179	Naragam	1
180	Kattukariveppu	1
181	Kambilimaram	1
182	Naringi	1
183	Kuyitti	1
184	Chandanam	1
185	Malampoovam	1
186	Poovam	1
187	Paali	1
188	Elengi	1
189	Laksmitharu	1
190	Karinjotta	1
191	Koori	1
192	Ellootti	1
193	Malavuram	1
194	Naripedukku	1
195	Pachotti	1
196	Kumizhu	1
197	Ezhilampala	1
198	Koonampala	1
199	Pana	1
200	Njetipana	1
201	Attirupe	1
<b>Total</b>		<b>481</b>

## CARBON FOOTPRINT OF THE CAMPUS (2022-23)

Various carbon emitting activities such as consumption of energy, transportation and waste generation leads to the total emission of **57.45tCO<sub>2</sub>e** per year by the campus. The total carbon sequestration by trees in the campus compound is **16.96tCO<sub>2</sub>e**. Thus, the current carbon footprint of the campus will be the difference of total carbon emission and total carbon sequestration/mitigation. The following table shows the carbon footprint level:

### Specific CO<sub>2</sub> Footprint

Amount of Carbon to be mitigated for Low Carbon Campus			
Sl No	Particulars	2021-22	2022-23
1	Total carbon emission tCO <sub>2</sub> e	36.10	57.45
2	Total carbon sequestration tCO <sub>2</sub> e	16.11	16.96
3	Amount of carbon mitigated through renewable energy tCO <sub>2</sub> e	22.13	22.87
4	To be mitigated tCO <sub>2</sub> e	-2.15	17.62
5	Total No of Students	2076	2053
6	Specific Carbon Footprint kg CO <sub>2</sub> e/Student/Yr	-1.03	8.58

The total specific carbon footprint is estimated as **8.58** kg of CO<sub>2</sub>e per student for the year 2022-23.

# 4

# Carbon Mitigation Plans





The total emission of the carbon dioxide per student is **57.45** kg per year (2022-2023). Emission reduction plans were prepared to bring the existing per capita carbon footprint to zero or below so as to bring the campus a carbon neutral or carbon negative campus.

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

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

- Resource optimisation
- Energy efficiency
- Renewable energy

## **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 utilisation 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 optimise its usage.

Currently, the campus 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 optimisation 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 uses biogas and commercial LPG cylinders for its cooking purpose. The campus can install a biogas plant to treat food waste and the biogas thus generated can be used in kitchen. Installation of 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 is another method. 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'.

## Carbon Mitigation Proposals

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.

<b>OTTOTRACTIONS- ENERGY AUDIT</b>						
<b>Payyanur College, Payyanur</b>						
<b>Greenhouse Gas Mitigation through Major Energy Efficiency Projects</b>						
Sl No	Projects proposed	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 50 No's T8 (40W) Lamps to 18W LED Tube	1056	1.06	10	0.77	7.71
2	Energy Saving in Lighting by replacing existing 17 No's T12 (55W) Lamps to 18W LED Tube	451	0.45	10	0.33	3.29
3	Energy Saving in Lighting by replacing existing 4 No's CFL (15W) Lamps to 9W LED Bulb	17	0.02	10	0.01	0.13
4	Energy Saving by replacing existing 371 No's in-efficient ceiling fans with Energy Efficient Five star fans	6981	6.98	10	5.10	50.96
<b>Total</b>		<b>8505</b>	<b>9</b>	<b>10</b>	<b>6.21</b>	<b>62.09</b>

OTTOTRACTIONS- ENERGY AUDIT						
Payyanur College, Payyanur						
Greenhouse Gas Mitigation through Renewable Energy Projects						
Sl No	Projects	Energy saved (Yearly)		Sustainability (Years)	First year ton of CO <sub>2</sub> mitigated	Expected Tons of CO <sub>2</sub> mitigated through out life cycle
		(kWh)	MWh	Years		
1	Installation of 20kWp Solar Power Plant	27375	27.38	25	19.98	499.59

OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal Code 1	
<b>Energy Saving in Lighting by replacing existing 50 No's T8 (40W) Lamps to 18W LED Tube</b>	
<b>Existing Scenario</b>	
50 numbers of T8(40 W) lamps were identified during the energy audit field survey in the facility. During discussion with officers it is observed that the average utility of these fittings are of 30%.	
<b>Proposed System</b>	
The existing T8 may be replaced to LED Tube of 18W in phased manner and the savings will be of 55% (inclusive of improved light output and reduced energy consumption)	
<b>Financial Analysis</b>	
Annual working hours (hr)	2400
No of fittings	50
Total load (kW)	2.00
Annual Energy Consumption (kWh)	1920
Expected Annual Energy saving for replacing all fittings (kWh)	1056
Cost of Power	14.00
Annual saving in Lakhs Rs (1st year)	0.15

Investment required for complete replacements [@Rs 300 per fittings] (Lakhs Rs)	0.15
Simple Pay Back (in Months)	12.18

OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal Code	
Energy Saving in Lighting by replacing existing 17 No's T12 (55W) Lamps to 18W LED Tube	
<b>Existing Scenario</b>	
17 numbers of T12(55 W) lamps were identified during the energy audit field survey in the facility. During discussion with officers it is observed that the average utility of these fittings are of 30%.	
<b>Proposed System</b>	
The existing T12 may be replaced to LED Tube of 18W in phased manner and the savings will be of 67% (inclusive of improved light output and reduced energy consumption)	
<b>Financial Analysis</b>	
Annual working hours (hr)	2400
No of fittings	17
Total load (kW)	0.94
Annual Energy Consumption (kWh)	673
Expected Annual Energy saving for replacing all fittings (kWh)	451
Cost of Power	8.00
Annual saving in Lakhs Rs (1st year)	0.04
Investment required for complete replacements [@Rs 300 per fittings](Lakhs Rs)	0.05
Simple Pay Back (in Months)	16.96



OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal	
Energy Saving by replacing existing 371 No's in-efficient ceiling fans with Energy Efficient Five star fans	
<b>Existing Scenario</b>	
There are 371 numbers of ceiling fans installed in the facility with minimum 8 hrs a day operation. All are conventional type and most of them are very old.	
<b>Proposed System</b>	
There is an energy saving opportunity in replace the existing fans with new five star labelled fans. The five star labelled fans give a savings up to 30% with higher service value (air delivery/watt).	
<b>Financial Analysis</b>	
Annual working hours (hrs)	2400
Total numbers of ordinary fans	371
Total load (kW)	25.97
Annual Energy Consumption (kWh)	24931
Expected Annual Energy saving, for total replacement(kWh)	6981
Cost of Power (Rs)	14.00
Annual saving in Lakhs Rs (1st year)	0.98
Investment required for a total replacement (Lakhs Rs)[@3000 Rs per Fan with 50W at full speed]	11.13
Simple Pay Back (in Months)	136.66

OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal 5	
Energy Saving in Lighting by replacing existing 4 No's CFL(15W) Lamps to 9W LED Bulb	
<b>Existing Scenario</b>	
24 numbers of CFL (15W) lamps were identified during the energy audit field survey in the facility. During discussion with officers it is observed that the average utility of these fittings are of 30%.	
<b>Proposed System</b>	
The existing CFL may be replaced to LED Bulb of 9W in phased manner and the savings will be of 40% (inclusive of improved light output and reduced energy consumption)	
<b>Financial Analysis</b>	
Annual working hours (hr)	2400
No of fittings	4
Total load (kW)	0.06
Annual Energy Consumption (kWh)	43
Expected Annual Energy saving for replacing all fittings (kWh)	17
Cost of Power	8.00
Annual saving in Lakhs Rs (1st year)	0.001
Investment required for complete replacements [@Rs 90 per fittings](Lakhs Rs)	0.004
Simple Pay Back (in Months)	31.25

Energy Saving Proposal	
Installation of 20kWp Solar Power Plant	
<b>Existing Scenario</b>	
There is a good potential of solar power electricity generation. The availability of sunlight is very high. There are some canopies available in the proposed site, but by having proper trimming of trees this may be avoided. If the SPVs are placed on the roof top it will help in improving RTTV (Roof Thermal Transmittance Value) of the building.	
<b>Proposed System</b>	
It is proposed to have a Solar Power Plant of 10kW at the beginning stage. The state and central government is pushing and giving good assistance to the installation. It can be installed as an internal grid connected system which is much cheaper than an off-grid system. Nowadays the technology provides a trouble-free grid interactive and connected system. The installation will provide 25 years of trouble-free generation with only 20% efficiency loss at the 25th year.	
<b>Financial Analysis</b>	
Proposed Solar installed Capacity (kW)	20
Total average kWh per day expected (3.5kWh/day average)	75.00
Total annual Generating Capacity (kWh)	27375
Cost of energy generated annually Lakhs Rs	3.64
Investment required (INR lakh)(Approx)	11.00
Simple Pay Back (in Months)	36.26
Life cycle in Yrs	25
Total Saving in Life Cycle (Approx) RS lakh	91.02

Executive Summary					
Consolidated Cost Benefit Analysis of Energy Efficiency Improvement Projects					
Payyanur College, Payyanur					
SI No	Projects	Investment	Cost saving	SPB	Energy saved
		(Lakhs Rs)	(Rs)/Yr	Months	kWh/Yr
1	Energy Saving in Lighting by replacing existing 50 No's T8 (40W) Lamps to 18W LED Tube	0.15	0.148	12.18	1056
2	Energy Saving in Lighting by replacing existing 17 No's T12 (55W) Lamps to 18W LED Tube	0.05	0.036	16.96	451
3	Energy Saving in Lighting by replacing existing 4 No's CFL(15W) Lamps to 9W LED Bulb	0.004	0.001	31.25	17
4	Energy Saving by replacing existing 371 No's in-efficient ceiling fans with Energy Efficient Five star fans	11.13	0.977	136.66	6981
	<b>Total</b>	<b>11.33</b>	<b>1.16</b>	<b>49.26</b>	<b>8505</b>
(The saving are projected as per the assumed operation time observed based in the discussions with the plant officials. The data of saving percentages are taken from BEE guide books and field measurements.)					



# 5

# CONCLUSION





The carbon emission from different sectors namely, Energy, Transportation and wastes were calculated using standard procedures. Carbon sequestration by the trees present in the campus was also estimated. From these the total carbon footprint of the campus was arrived at.

Net Carbon Emission after implementing Energy Efficiency projects and Renewable Energy Projects Proposed		
1	Total Carbon Foot Print tCO <sub>2</sub> e/yr	57.45
2	Carbon Sequestered tCO <sub>2</sub> e/yr	16.96
3	Carbon mitigated by Renewable Energy tCO <sub>2</sub> e/yr (Installed)	22.87
4	Carbon mitigated by Renewable Energy tCO <sub>2</sub> e/yr (Proposed)	19.98
5	Carbon mitigated by Energy Efficiency (Proposed) tCO <sub>2</sub> e/yr	6.21
6	Effective Carbon footprint tCO <sub>2</sub> e/yr	-8.57
7	Total No of Students	1939
8	Specific Carbon Footprint kg CO <sub>2</sub> e/Student/Yr	-4.42

From this study it was found that carbon footprint of the campus to be **-4.42 kgCO<sub>2</sub>e/ Student/ Year** in place of current footprint i.e., **29.63kgCO<sub>2</sub>e/ student/ Year**. To achieve this, an investment of **22.33 Lakhs Rs** is required through energy efficiency and renewable energy projects proposed. It will be around **1152 Rs per student** to make the campus the carbon negative.

Cost to make the campus Carbon Negative		
1	Cost of implementation in Energy Efficiency Lakhs Rs	11.33
2	Cost of implementation in Renewable Energy Lakhs Rs	11.00
3	Total Lakhs Rs	22.33
4	Total number of students	1939
5	Cost per student to make the campus carbon negative Rs/ Student	1152

# REFERENCES

## Reports and Books

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- Home Energy Audit Manual (2017), Ottotractions & EMC Kerala, No.ES 26, Pp.114
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## Website

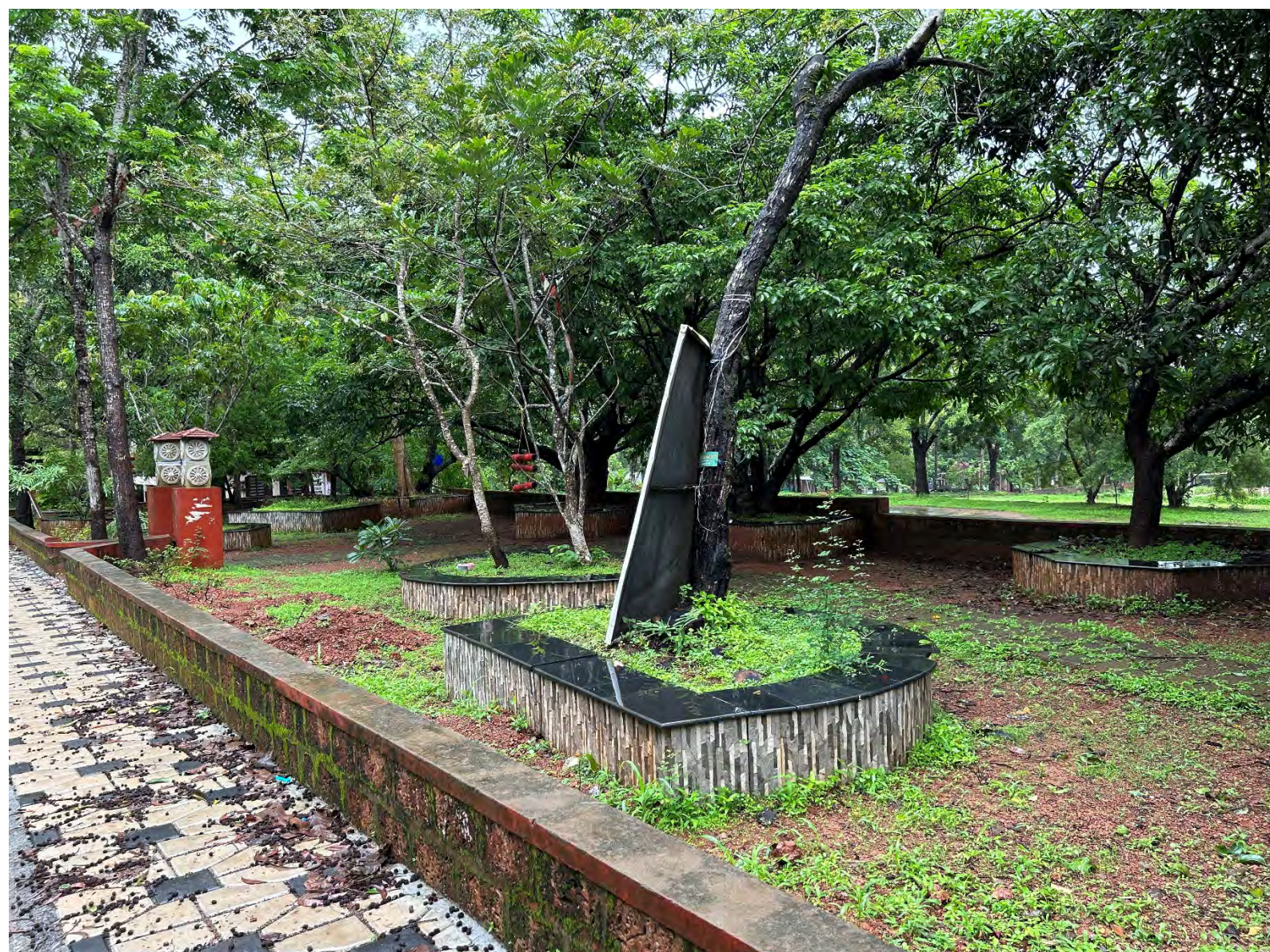
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# 6

# TECHNICAL SUPPLEMENT





Payyanur College, Payyanur																						
Sl.No	Floor	Location	Lights							Fans				IT			Projector	AC (1Tr) 3*	TV	Grinder	CP	
			LED-T	LED-B	LED-SQ	T5	T8	T12	CFL	CF	WF	EF	PF	Printer	Photostat	PC					15	2
1		Canteen	17							13		2								1		
2	Main Block	Girls Room	4							2												
3		Classroom1	1				1			2												
4		Classroom2	2				2			4												
5		2 Classrooms	6				2			8												
6		5 Classrooms	5				5			20												
7		Staffroom	3				1			5				1		2						
8		Principal Room			4						2		1	1		1		1	1			
9		office	10				1			11					1	10						
10		3 Classrooms	7							5												
11		G1	3							4												
12		Dept. of Management studies	3							4				1		1						
13		4 Classrooms	16							24							4					
14		G4	3							4												
15		Corridor	8																			
16		B.Com 4Classrooms	20							24							4					
17		Commerce Department	2							6				1		1						
18		IQAC			4						3			1		4	1	1				
19		Computer Lab			2						8					52		3			1	
20		Department Room	5							5				2		2						
21		9 Classrooms	27							36							9					



22		English Department	5							5				1		1				
23		library	2																	
24		botany Lab	9	3						8							1			
25		Msc. Plant Science Classroom	6							4							1			
26		Botany Department Staffroom	4							3	1			1		2				
27		zoology lab	9	5						8							1			
28		Zoology Department Staffroom	4							3	1			1		2				
29		Msc. Zoology	6							4							1			
30		MSc Chemistry	2	1		1				2							1			
31		Chemistry Department	1	4		2				4						1				
32		Chemistry Lab	9	2		3		2				4								
33		BSc Chemistry	7	14		1	1	1	1	2	10	1								
34		Library	2							2										
35		Bsc Physics lab	10			2				10						1				
36		Classroom	3			3				6										
37		MSc Physics Lab	4							8										
38		Physics Department					2			4				1		1				
39		Classroom	3							2							1			
40		Economics Department	1							1										
41		13 Classroom	13			26				26							26			
42		3 Departments	6							6				3		3				
43	seminar	3 Classrooms	12							9										
44	nar	seminar hall																		
45		50 Rooms	50							50										
46		Corridor	14							1										
47		Auditorium	10	2			14			20	2									

48	Library	41	4					1	7	9	1		1								1	
	<b>Total</b>	<b>37</b>	<b>5</b>	<b>35</b>	<b>10</b>	<b>0</b>	<b>50</b>	<b>17</b>	<b>4</b>	<b>37</b>	<b>1</b>	<b>28</b>	<b>17</b>	<b>2</b>	<b>15</b>	<b>1</b>	<b>84</b>	<b>50</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1</b>

CALL  
**1912**  
CUSTOMER CARE 24x7  
**KSEB**  
Kerala State Electricity Board

Demand/Disconnection Notice  
(As per Reg 122 of Supply Code-2014)  
Kunhimangalam Section  
0437-2811379  
KSEBL-GSTIN: 32AEECK2277NBZ1

C#: 1166394001043

Bill# : 6639220600710  
Conn. Id : 10182790  
Name : PRINCIPAL PAPPANUR C  
EDATKUNHIMANGALAM

C Status : Connected  
Pole : NH-65/2  
Trans : J K VILLA  
Meter# : 0014715112  
Bill Area : MD1/1/39  
Bill Date : 01/06/2022  
Due Date : 11/06/2022  
Disconn Dt : 27/06/2022  
Tariff : LT-4R Ind  
Purpose : Pumping Water F  
\$ Deposit : 8750  
Meter(MH)Status OK  
Load : 6 KW  
C Demand : 5.6 KVA  
Phase : 3  
Prv Rd Dt : 03/05/2022  
Prs Rd Dt : 01/06/2022  
Mtr Rd(OMF) : 1

**Prev. Payment**

Prv Paid Dt : 07-05-2022  
Prv Paid Amt : 12823

**Readings & Cons.**

Unit	Curr	Prev	Cons	Avg
KWH/A/1	4464	44035	429	1337

**Bill Details**

Fixed Charges	: 120.00
Meter Rent	: 17.70
Energy Charges	: 2423.85
Duty	: 242.38
Round off	: 0.07
<b>Bill Amount</b>	<b>: 2804.00</b>
ACD/ADJ	: 8144.00
Advance	: 372.00
<b>Payable</b>	<b>: 10576.00</b>

Main Block  
CALL  
**1912**  
CUSTOMER CARE 24x7  
**KSEB**  
Kerala State Electricity Board

Demand/Disconnection Notice  
(As per Reg 122 of Supply Code-2014)  
Kunhimangalam Section  
0437-2811379  
KSEBL-GSTIN: 32AEECK2277NBZ1

C#: 1166396000079

Bill# : 6639220800052  
Conn. Id : 10180355  
Name : PRESIDENT PAPPANUR E  
PAPPANUR COLLEGE

C Status : Connected  
Pole : PNR-13A  
Trans : PAPPANUR COLLEGE  
Meter# : X1413883  
Bill Area : MD1/1/39  
Bill Date : 01/06/2022  
Due Date : 11/06/2022  
Disconn Dt : 26/06/2022  
Tariff : LT-6R NDM  
Purpose : Educational Ins  
Deposit : 78000  
Meter(MH)Status OK  
Load : 78 KW  
Demand : 77.366 KVA  
Phase : 3  
Prv Rd Dt : 01/07/2022  
Prs Rd Dt : 01/06/2022  
Mtr Rd(OMF) : 20

**Prev. Payment**

Prv Paid Dt : 11-07-2022  
Prv Paid Amt : 16

**Readings & Cons.**

Unit	Curr	Prev	Cons	Avg
KWH/A/1	1190	1094	1912	4168
KWH/A/E	233	225	157	0

**Bill Details**

Fixed Charges	: 5460.00
Meter Rent	: 0.00
GST	: 0.00
Energy Charges	: 11669.42
Duty	: 1166.94
Round off	: -0.36
<b>Bill Amount</b>	<b>: 18296.00</b>
<b>Payable</b>	<b>: 18296.00</b>

## ELECTRICAL SECTION KUNHIMANGALAM

CONSUMER No. 1166396000079

## Solar OnGrid Consumption Adjustment Report

Bill Month	Consumer #	Import	Export	Net Rdg		Zone Code	Consu Mption	Ban Ked Ene Rgy	Factor	Solar Energy	Adju Sted	Billed	Ban Ked Bala Nce	Remarks
				(+ve Import)	(-ve Export)					(Bank Ene Rgy X Factor)	from Bank	Consu Mption		
202109	1166396000079	188	28	160	A	188	0	1	0	0	160	0		
202110	1166396000079	1696	0	1696	A	1696	0	1	0	0	1696	0		
202111	1166396000079	2241	116	2125	A	2241	0	1	0	0	2125	0		
202112	1166396000079	2144	416	1728	A	2144	0	1	0	0	1728	0		
202201	1166396000079	1443	901	542	A	1443	0	1	0	0	542	0		
202202	1166396000079	1218	798	420	A	1218	0	1	0	0	420	0		
202203	1166396000079	1687	486	1201	A	1687	0	1	0	0	1201	0		
202204	1166396000079	4765	396	4369	A	4765	0	1	0	0	4369	0		
202205	1166396000079	973	1227	-254	A	973	0	1	0	0	0	254		
202206	1166396000079	2325	0	2325	A	2325	0	1	0	0	2071	0		
202207	1166396000079	3200	135	3065	A	3200	0	1	0	0	3065	0		
202208	1166396000079	1912	157	1755	A	1912	157	1	157	157	1755	0		
202209	1166396000079	1694	466	1228	A	1694	466	1	466	466	1228	0		
202210	1166396000079	1823	840	983	A	1823	0	1	0	0	983	0		
202211	1166396000079	1859	568	1291	A	1859	568	1	568	568	1291	0		



# ELECTRICAL SECTION KUNHIMANGALAM

## CONSUMER No. 1166396000079

### Solar OnGrid Consumption Adjustment Report

Bill Month	Consumer #	Zone Code	Import	Export	Export +	Factor	Solar Energy	Adju	Billed	Ban Ked Bala Nce	Remarks
					Ban Ked Energy		(Bank Energy X Factor)	Sted	from Bank		
202212	1166396000079	A	2988	222	222	1	222	222	2766	0	
202301	1166396000079	A	1958	870	870	1	870	870	1088	0	
202302	1166396000079	A	2438	481	481	1	481	481	1957	0	
202303	1166396000079	A	3817	267	267	1	267	267	3550	0	
202304	1166396000079	A	3038	565	565	1	565	565	2473	0	
202305	1166396000079	A	1447	934	0	1	0	0	513	0	
202306	1166396000079	A	1961	602	602	1	602	602	1359	0	
202307	1166396000079	A	3297	195	195	1	195	195	3102	0	
202308	1166396000079	A	3246	96	96	1	96	96	3150	0	
202309	1166396000079	A	2762	494	494	1	494	494	2268	0	

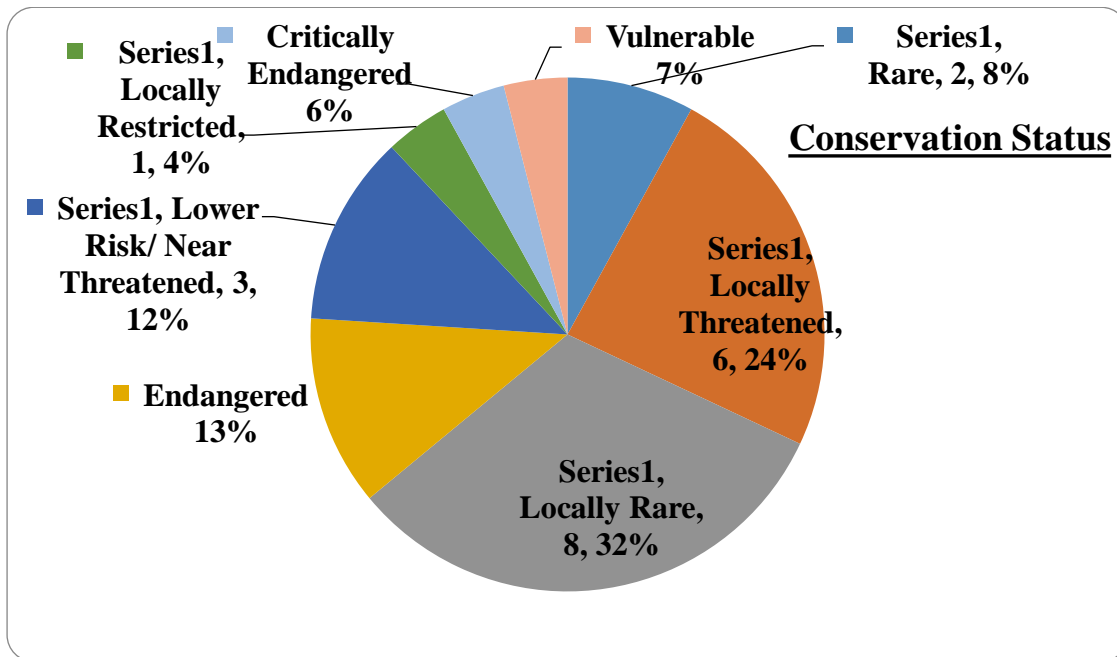
## RARE AND ENDEMIC TREES IN THE PAYYANUR COLLEGE CAMPUS

Seventy-nine species of Rare Endemic and Threatened (RET) flowering plants (Angiosperms) of the Western Ghats from 29 plant families have been planted and conserved in the Payyanur college conservation garden (240 plants). These include 71 trees and 8 woody climbers. More than 65% of these species are coming under various threat categories of IUCN (Nayar, 1997), (Table 1). Among these *Vatica chinensis*, *Poeciloneuron pauciflorum*, *Nothopegia heyneana* and *Aglaia malabarica* are ‘**Critically Endangered**’ (CR) tree species and *Syzygium occidentalis*, *Kunstleria keralensis*, *Saraca asoca*, *Myristica malabarica* and *Palaquium bourdillonii* listed as ‘**Vulnerable**’ (VU). Nine tree species like *Dipterocarpus indicus*, *Hopea parviflora*, and *Syzygium stocksii* are coming under the category “**Endangered**” (E). *Humboldtia vahliana* *Vepris bilocularis*, *Phaeanthus malabaricus* and *Actinodaphne malabarica* are coming under the ‘**Rare**’ (R) category of IUCN Red Data Book. Thirteen plants are coming under the IUCN category of ‘Locally Rare’. Some of them are *Baccaurea courtallensis*, *Cullenia exarillata*, *Diospyros pruriens*, *Flacourtia montana*, *Otonephelium stipulaceum*, *Artocarpus hirsutus*, and *Cinnamomum sulphuratum* (Annexure). *Gluta travancorica*, and *Sageraea laurina* are coming under the category of ‘Lower Risk’ or ‘Near Threatened’. *Mesua thwaitesii* is listed under the category “Locally Restricted’. *Aporosa lindleyana*, *Elaeocarpus serratus* var. *weibelii*, *Lagerstroemia microcarpa*, *Polyalthia fragrans*, and *Radermachera xylocarpa* etc. are some of the common endemic tree species of the Western Ghats that are conserved in the garden.

**Table 1:** Conservation status of RET plant species planted in ‘Shanthishal’

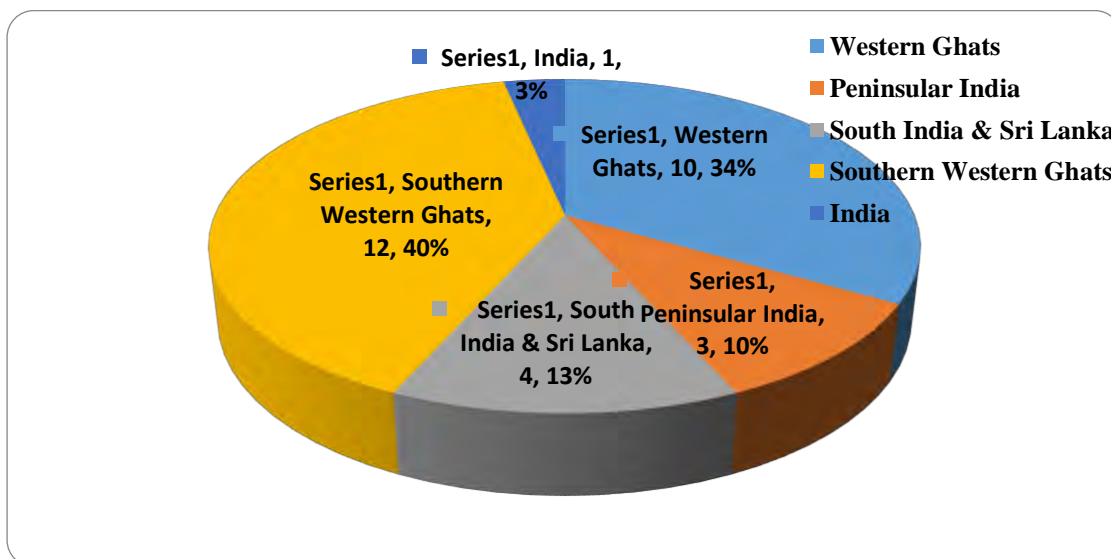
Conservation Status	No. of plant Species
Critically Endangered (CR)	4
Endangered (E)	9
Rare (R)	4
Locally rare	13
Vulnerable	5
Lower risk/Near threatened	10

**Figure 2: Conservation status of plant species planted in the “Shanthisthal”**



Based on the size and growth pattern of plant species that are planted in the Shanthisthal’ they can be classified in to large trees, medium sized trees, small trees and woody climbers. Out of the 79 species 71 are trees and 8 are woody climbers.

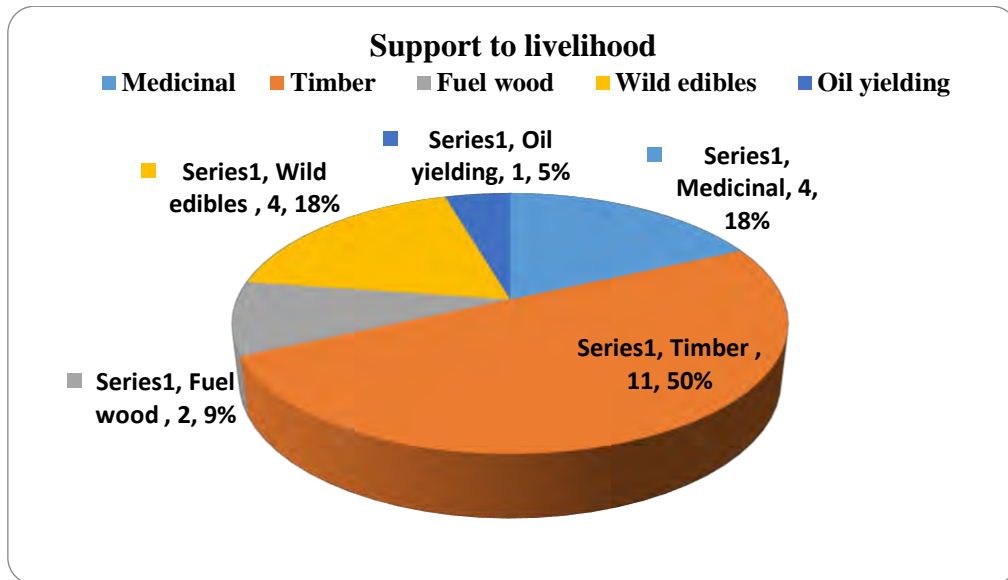
Out of 79 Western Ghats Endemic plants species that are conserved in the Shanthisthal’ 40% are endemic to southern Western Ghats, 13% species are endemic to south India and Sri Lanka, and 3 species restricted to Kerala part of Western Ghats (Figure 3).



**Figure 3: Percentage of Endemism**

Out of the 79 species conserved in the garden 49 have known uses (70%). 28 species are used for medicinal purpose, 11 are timber yielding, 2 are used as fuel wood, 7 species yield edible fruits and 1 species oil yielding (Figure 4).

**Figure 4: Known uses of plant species conserved in the ‘Shanthishal’**



More than 80% of planted species are seen in evergreen and semi evergreen forests of Western Ghats and less than 5 % are having restricted distribution in Deciduous forests.



**Annexure 1:** List of Western Ghats Endemic flowering plant species (trees and woody climbers) and other medicinal trees growing in the Payyanur College campus

SL. No	Scientific name	No. of plants	Local Name	Family	Status
1.	<i>Actinodaphne malabarica</i> Balakr.	2	Pattuthalli	Lauraceae	R
2.	<i>Aglaia malabarica</i> Sasisdh.	2	Chuvanna Cheeralam	Meliaceae	CR
3.	<i>Aporosa lindeleyana</i>	3	Vetti	Euphorbiaceae	
4.	<i>Artocarpus hirsutus</i> Lam.	4	Anjili	Moraceae	
5.	<i>Baccaurea courtallensis</i> (Wight) Muell.	2	Mootilpazham	Euphorbiaceae	
6.	<i>Calophyllum austroindicum</i> Kosterm.	2	Cholappunna	Clusiaceae	
7.	<i>Cinnamomum malabattrum</i>	5	Karappa	Lauraceae	
8.	<i>Cinnamomum sulphuratum</i> Nees.	2	Kattukaruva	Lauraceae	
9.	<i>Cullenia exarillata</i> Robyns	3	Mullanpali	Bombacaceae	
10.	<i>Cyathocalyx zeylanica</i> Champ. ex Hook. f. & Thoms.	5	Kodavazha	Annonaceae	
11.	<i>Dillenia bracteata</i> Wight	1	Kattupunna	Dilleniaceae	
12.	<i>Diospyros paniculata</i> Dalz.	2	Karivella	Ebenaceae	
13.	<i>Diospyros pruriens</i> Dalz.	2	Illakkatta	Ebenaceae	
14.	<i>Dipterocarpus indicus</i> Bedd.	3	Kalpayin	Dipterocarpaceae	EN
15.	<i>Elaeocarpus serratus</i> L. var. <i>weibelii</i> Zmarzty	2	Badraksham	Elaeocarpaceae	
16.	<i>Filicium decipens</i> (Wight & Arn.) Thw.	1	Irumbarakki	Spaindaceae	
17.	<i>Flacourtia montana</i> Graham	3	Chalir	Flacourtiaceae	
18.	<i>Gluta travancorica</i> Bedd.	1	Chenkurinji	Anacardiaceae	LRN T
19.	<i>Goniothalamus cardiopetalus</i> Bedd.	1	-	Annonaceae	
20.	<i>Hopea ponga</i> (Bedd.) van Sloot.,	3	Eeyakam	Dipterocarpaceae	EN
21.	<i>Hopea parviflora</i> Bedd	6	Irumbakam	Dipterocarpaceae	EN
22.	<i>Hopea racophloea</i> Dyer in Hook. f.	2	Naduvalipongu	Dipterocarpaceae	EN
23.	<i>Humboldtia brunoniana</i>	2		Caesalpiniaceae	
24.	<i>Humboldtia vahliana</i> Wight	5	Attuvanchi	Caesalpiniaceae	R
25.	<i>Knema attenuate</i>	2	Chorapayin	Myristicaceae	
26.	<i>Hydnocarpus pentandra</i> (Buch.- Ham.) Oken	6	Marotti	Flacourtiaceae	
27.	<i>Lagerstroemia microcarpa</i> Wight	3	Venthekku	Lythraceae	
28.	<i>Mastixia arborea</i> (Wight) Bedd.	1	Vella adambu	Cornaceae	
29.	<i>Mesua thwaitesii</i> Planch. & Triana	3	Nangu	Clusiaceae	
30.	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz	3	Palakapayyani	Bignoniaceae	
31.	<i>Otonephelium stipulaceum</i> (Bedd.) Radlk.	2	Poripoovam	Sapidaceae	
32.	<i>Palaquium bourdillonii</i> Brandis	1	Pali	Sapotaceae	VU
33.	<i>Pittosporum neelgherrense</i> Wight & Arn.	7	Analivegam	Pittosporaceae	
34.	<i>Poeciloneuron pauciflorum</i> Bedd.	2	Pulivayila	Clusiaceae	CR
35.	<i>Polyalthia fragrans</i> (Dalz.) Bedd.	2	Nedunar	Annonaceae	
36.	<i>Pterospermum rubiginosum</i> Heyne.	4	Ellootti	Sterculiaceae	
37.	<i>Radermachera xylocarpa</i> (Roxb.) K.	5	Pambukaimara	Bignoniaceae	
38.	<i>Sageraea laurina</i> Dalz.	2	Kanakaitha	Annonaceae	LRN T

39.	<i>Tabernaemontana heyneana</i> Wall	1			
40.	<i>Terminalia travancorensis</i> Wight & Arn.	6	Kattukadukka	Combretaceae	
41.	<i>Turpinia malabarica</i> Gamble	1	Aluknumaram	Staphyleaceae	
42.	<i>Vateria indica</i>	3	Vellapayin		
43.	<i>Vatica chinensis</i> L.	6	Adakkapayin	Dipterocarpaceae	CR
44.	<i>Vepris bilocularis</i> (Wight & Arn.) Engl.	2	Moothasari	Rutaceae	R
45.	<i>Madhuca bourdillonii</i> (Gamble) H.J. Lam.	4	Thandidiyan	Sapotaceae	EN
46.	<i>Syzygium occidentale</i> (Bourd.) Gandhi	2	Attuchamba	Myrtaceae	VU
47.	<i>Syzygium stocksii</i> (Duthie) Gamble	2	Kollinjaval	Myrtaceae	EN
48.	<i>Syzygium mundagam</i> (Bourd.) Chithra	1	Kattuchamba	Myrtaceae	
49.	<i>Syzygium cumini</i> L.	1	Njaval	Myrtaceae	
50.	<i>Kingiodendron pinnatum</i> (Roxb. ex DC.) Harms	2	Ennapayin	Caesalpiniaceae	EN
51.	<i>Chukrasia tabularis</i> A. Juss.	5	Chuvanna Akil	Meliaceae	
52.	<i>Myristica beddomei</i> King	1	Kattujathi	Myristicaceae	
53.	<i>Myristica malabarica</i> Lam.	1	Kattujathi	Myristicaceae	VU
54.	<i>Cynometra beddomei</i> Prain	2	Cherukoori	Caesalpiniaceae	EN
55.	<i>Cynometra travancorica</i> Bedd.	1	Koori	Caesalpiniaceae	EN
56.	<i>Polyalthia coffeoides</i> L.	1	Nedunar	Annonaceae	
57.	<i>Phaeanthus malabaricus</i> Bedd.	1	Kunukipanal	Annonaceae	Rare
58.	<i>Nothopegia heyneana</i> (Hook. f.) Gamble	2		Anacardiaceae	CR
59.	<i>Saraca asoca</i> (Roxb.) de Wilde	4	Asokam	Caesalpiniaceae	VU
60.	<i>Mimusops elengi</i> L.	63	Elenji	Sapotaceae	
61.	<i>Schleichera oleosa</i> (Lour.) Oken	1	Poovam	Sapindaceae	
62.	<i>Memecylon randerianum</i> SM	4	Koovachekki	Melastomataceae	
63.	<i>Desmos lawii</i> (Hook. f. & Thoms.) Safford	1		Annonaceae	
64.	<i>Bauhinia phoenicea</i> Wight & Arn.	3	Vallimandaram	Caesalpiniaceae	
65.	<i>Beaumontia jerdoniana</i> Wight	2	Swedapushpi	Apocynaceae	
66.	<i>Celastrus paniculatus</i> Willd.	2	Jyothishmrithi	Celastraceae	
67.	<i>Kunstleria keralensis</i> Mohanan	2	Mutharivalli	Fabaceae	VU
68.	<i>Erycibe paniculata</i> Roxb.	2	Erumathali	Convolvulaceae	
69.	<i>Sarcostigma kleinii</i> Wight & Arn.	2	Odal	Icacinaceae	
70.	<i>Derris brevipes</i> (Benth.) Baker	2	Pannivalli	Fabaceae	

**Other Common medicinal Trees in the Campus**

71.	<i>Ficus benghalensis</i>	1	Peral	Moraceae	
72.	<i>Ficus religiosa</i>	2	Arayal	Moraceae	
73.	<i>Ficus racemosa</i>	2	Athi	Moraceae	
74.	<i>Terminalia chebula</i>	4	Thanni	Combretaceae	
75.	<i>Terminalia crenulata</i>	4	Neermaruthu	Combretaceae	
76.	<i>Lagestroemia speciosa</i>	10	Poomaruthu	Lythraceae	
77.	<i>Embilca officinalis</i>	5	Nelli	Euphorbiaceae	
78.	<i>Pongamia pinnata</i>	7	Ungu	Fabaceae	
79.	<i>Mangifera indica</i>	10	Mavu	Anacardiaceae	
80.	<i>Artocarpus heterophyllus</i>	2	Plavu	Moraceae	
81.	<i>Swietenia mahagony</i>	20	Mahagony	Meliaceae	

82.	<i>Gmelina arborea</i>	6	Kumizhu	Verbenaceae	
83.	<i>Bauhinia purpurea</i>	2	Mandaram	Fabaceae	
84.	<i>Syzygium cumini</i>	4	Njaval	Myrtaceae	
85.	<i>Azadiracta indica</i>	1	Veppu	Meliaceae	
86.	<i>Casuarina equisetifolia</i>	14	Kattadi	Casuarinaceae	
87.	<i>Saraca indica</i>	3	Asokam	Fabaceae	
88.	<i>Trema orientalis</i>	7	Nukhamaram	Ulmaceae	
89.	<i>Tectona grandis</i>	8	Thekku	Verbenaceae	
90.	<i>Canarium strictum</i>	2	Pandham	Burseraceae	
91.	<i>Xanthoxylum rhetza</i>	2	Kuyittii	Rutaceae	
92.	<i>Aegle marmelos</i>	6	Koovalam	Rutaceae	
93.	<i>Cassia fistula</i>	5	Kanikonna	Fabaceae	
94.	<i>Canthium traqvincoricum</i>	1	Kaara	Rubiaceae	
95.	<i>Ficus auticulata</i>	2	Garden Athi	Moraceae	
96.	<i>Terminalia catappa</i>	3	India Badham	Combretaceae	
97.	<i>Simarouba glauca</i>	3	Lakshmitharu	Simaroubaceae	
98.	<i>Calophyllum inophyllum</i>	1	Punna	calophyllaceae	
99.	<i>Persea macrantha</i>	1	Kulirmavu	Lauraceae	
100	<i>Wrightia tinctoria</i>	2	Danthapala	Apocynaceae	
<b>Total</b>		<b>380</b>			

**EN**\_ Endangered; **CR**\_ Critically Endangered; **VU**\_ Vulnerable; **R**\_ Rare; **LRNT**\_ Lower Risk /Near Threatened.

**Annexure 2.** Scientific name, family, local name, habit, habitat, distribution and status of some of the rare tree species that are conserved in the Payyanur College ‘Santhisthal’ are given below.

1. Scientific Name: *Actinodaphne malabarica* Balakr.

**Family:** Lauraceae

**Habit:** Large tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic, southern Western Ghats

**Uses:** Medicinal. Leaf infusion useful in the treatment of urinary disorders and diabetes, timber, fuel wood.

**Key characters:** Leaves elliptic, acuminate, base acute. Flowers pedicelled. Fruit berry globose.

**IUCN status:** Rare (Nayar, 1997)

**No. of seedlings planted:** 2

2. Scientific Name: *Aglaia malabarica* Sasidh.

**Family:** Meliaceae

**Habit:** Small to medium Tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to southern Western Ghats (Kerala)

**Uses:** Medicinal.

**Key characters:** Leaves simple, lanceolate, acuminate, base acute or obtuse, glabrous. Bark reddish brown. Fruit berry.

**IUCN status:** Critically Endangered (Nayar, 1997).

**No. of seedlings planted:** 2

3. Scientific Name: *Aporosa lindleyana* (Wt.) Bail.

**Family:** Euphorbiaceae

**Habit:** Large Tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to Western Ghats

**Uses:** Fruit edible. Timber yielding, as fuel wood

**Key characters:** Leaves simple, alternate, spiral; stipules oblong-lanceolate, acute, caducous. Flowers unisexual, dioecious; male flowers in axillary catkins; female flowers in condensed cymes.

**No. of seedlings planted:** 3

4. Scientific Name: *Artocarpus hirsutus* Lam.

**Family:** Moraceae

**Habit:** Large tree

**Habitat:** Semi evergreen and moist deciduous forests, also in the plains

**Distribution:** Endemic to southern Western Ghats

**Uses:** Timber, fruit edible

**Key characters:** Leaves broadly ovate or elliptic, acuminate, base truncate, coriaceous. Bark brownish-black. Flowers in spikes, free in male flowers, tubular in female. Fruit aggregate. Seeds globose.

**IUCN status:** Locally Threatened

**No. of seedlings planted:** 2

5. Scientific Name: *Baccaurea courtallensis* (Wight) Muell.-Arg.

**Family:** Euphorbiaceae

**Habit:** Tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to Peninsular India

**Uses:** Fruit edible



**Key characters:** Leaves alternate, often clustered towards the branch tips. Bark white. Flowers dioecious, in densely clustered, slender racemes. Fruit capsule, globose, tomentose, red. Seeds 3, oblong, arillate.

**IUCN status:** Locally Rare

**No. of seedlings planted:** 1

6. Scientific Name: *Cullenia exarillata* Robyns

**Family:** Bombacaceae

**Habit:** Large tree

**Habitat:** Semi evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Fruit edible, Timber yielding.

**Key characters:** Leaves simple, oblong-lanceate to elliptic, base rounded or subacute, apex acuminate, coriaceous. Flowers yellow, in dense fascicles on old wood. Fruits capsule globose. Seeds large, arillate.

**IUCN status:** Locally Rare

**No. of seedlings planted:** 3

7. Scientific Name: *Calophyllum austroindicum* Kosterm. ex Stevens

**Family:** Clusiaceae

**Habit:** Tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Timber yielding

**Key characters:** Leaves coriaceous above, acute, base cuneate, rigidly coriaceous. Bark rough. Flowers short axillary and panicles. Fruit ellipsoid, greenish purple, smooth.

**IUCN status:** Locally Rare

**No. of seedlings planted:** 2

8. Scientific Name: *Cinnamomum sulphuratum* Nees in Wall.

**Family:** Lauraceae

**Habit:** Medium tree

**Habitat:** Evergreen and shola forests

**Distribution:** Endemic to Western Ghats

**Key characters:** Bark reddish- brown with aromatic smell. Leaves elliptic to linear-elliptic. Panicles terminal and axillary, pedicels. Fruit berry, ellipsoid

**IUCN status:** Locally Threatened

**No. of seedlings planted:** 2

9. Scientific Name: *Cyathocalyx zeylanica* Champ. ex Hook. f. & Thoms.

**Family:** Annonaceae

**Habit:** Small to medium tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to south India & Sri Lanka

**Key characters:** Leaves elliptic-oblong, caudate, acuminate, base acute or obtuse, glabrous. Flowers solitary or in pairs. Berry ovoid. Seeds compressed.

**IUCN status:** Locally Rare

**No. of seedlings planted:** 5

10. Scientific Name: *Dillenia bracteata* Wight

**Family:** Dilleniaceae

**Habit:** Medium tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to Western Ghats

**Key characters:** Leaves simple, Alternate, spiral. Bark grayish- brown. Flowers bisexual, racemes Seed dark reddish- brown to black arillate, glabrous.

**No. of seedlings planted:** 1

11. Scientific Name: *Diospyros pruriens* Dalz.

**Family:** Ebenaceae

**Habit:** Small tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to Western Ghats

**Key characters:** Leaves oblong-lanceolate, acute, subcordate. male flowers in cymes, female flowers axillary fascicles, sessile; fruit capsule.

**IUCN status:** Locally Rare

**No. of seedlings planted:** 2

12. Scientific Name: *Dipterocarpus indicus* Bedd.

**Family:** Dipterocarpaceae

**Habit:** Large tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to Western Ghats

**Uses:** Timber, oil yielding

**Key characters:** Leaves ovate, acute, base truncate or acute. Bark smooth, gray inside. Flowers axillary racemes, white with pink tinge. Fruit wings oblong, reddish brown.

**IUCN status:** Endangered (IUCN, 2011)

**No. of seedlings planted: 2**

13. Scientific Name: *Elaeocarpus serratus* L. var. *weibelii* Zmarzty

**Family:** Elaeocarpaceae

**Habit:** Medium tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to Peninsular India

**Key characters:** Leaves elliptic- oblong, acute at both ends, distantly serrate, glabrous above and glabrescent below. Drupe ovoid or globose.

**No. of seedlings planted: 2**

14. Scientific Name: *Flacourtia montana* Graham

**Family:** Flacourtiaceae

**Habit:** Small to medium tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to India

**Key characters:** Leaves ovate, acuminate or acute, base acute or rounded, crenate, glabrous except the midrib below. Capsule orange-yellow.

**IUCN status:** Locally Rare

**No. of seedlings planted: 3**

15. Scientific Name: *Gluta travancorica* Bedd.

**Family:** Anacardiaceae

**Habit:** Large tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Timber

**Key characters:** Spathulate leaves and cream-coloured flowers. The bark is smooth, pinkish grey.

**IUCN status:** Lower Risk/near threatened

(IUCN 2011)

**No. of seedlings planted: 1**

16. Scientific Name: *Hopea parviflora* Bedd.

**Family:** Dipterocarpaceae

**Habit:** Large trees

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to Western Ghats

**Uses:** Timber yielding

**Key characters:** Leaves lanceate, base rounded to acute, apex acute. Bark splitting into elongated pieces, rusty brown or greyish. Flowers pedicelled, glabrous, in axillary and terminal, dense pubescent panicles. Nuts glabrous

**IUCN status:** Endangered, (IUCN 2011).

**No. of seedlings planted: 5**

17. Scientific Name: *Humboldtia vahliana* Wight

**Family:** Caesalpiaceae

**Habit:** Medium tree

**Habitat:** Along river banks in semi evergreen and evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Key characters:** Leaves even-pinnate, stipules foliaceous, coriaceous. Racemes corymbiform, axillary and cauline. Pods oblanceate, brownish- velvety. Seeds discoid

**IUCN status:** Locally Rare

**No. of seedlings planted: 5**

18. Scientific Name: *Hydnocarpus pentandra* (Buch.-Ham.) Oken

**Family:** Flacourtiaceae

**Habit:** Medium tree

**Habitat:** Semi evergreen and moist deciduous forests, also in the plains

**Distribution:** Endemic to Western Ghats

**Key characters:** Leaves elliptic- oblong, base rounded to obliquely, cuneate, apex acuminate. Flowers in axillary cymes. Fruit berry, globose.

**IUCN status:** Locally Threatened

**No. of seedlings planted: 4**

19. Scientific Name: *Lagerstroemia microcarpa* Wight

**Family:** Lythraceae

**Habit:** Large tree

**Habitat:** Moist deciduous forests, also in the plains

**Distribution:** Endemic to Western Ghats

**Key characters:** Leaves opposite, elliptic-lanceate, base broadly cuneate, apex acuminate. Bark smooth. Flowers pedicillate, pubescent, in terminal panicles. Fruit capsule. seed 3-4 in each cell, flat, winged.

**No. of seedlings planted: 3**

20. Scientific Name: *Mastixia arborea* (Wight) Bedd.

**Family:** Cornaceae

**Habit:** Medium tree

**Habitat:** Shola and evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Timber yielding

**Key characters:** Leaves simple, alternate, broadly elliptic to oblong-elliptic, base cuneate, apex caudate-acuminate, thin-coriaceous. Flowers bisexual, in terminal, cymose panicles. Drupe ellipsoid.

**IUCN status:** Lower Risk/least concern (2011)

**No. of seedlings planted: 1**

21. Scientific Name: *Mesua thwaitesii* Planch. & Triana

**Family:** Clusiaceae

**Habit:** Large tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to south India and Sri Lanka

**Key characters:** Leaves oblong, acuminate at apex, acute at base, thickly coriaceous, pale green above, glaucous, white beneath. Flowers in terminal cymes, sessile. Capsule 3-5 cm across, depressed globose, acute, greenish yellow, surrounded by enlarged sepals and bracts; seeds 2 or 3, plano-convex or trigonous, brown.

**IUCN status:** Locally restricted

**No. of seedlings planted: 2**

22. Scientific Name: *Oroxylum indicum* (L.) Benth. ex Kurz



**Family:** Bignoniaceae

**Habit:** Small to medium tree

**Habitat:** Moist deciduous forest and also in the plain

**Distribution:** Endemic to south India & Sri Lanka

**Key characters:** Leaves pinnae opposite, ovate or elliptic, acuminate, base rounded or cordate. Fruit capsule. Seeds 5-6 cm long.

**IUCN status:** Locally Threatened

**No. of seedlings planted: 2**

23. Scientific Name: *Otonephelium stipulaceum* (Bedd.) Radlk.

**Family:** Sapindaceae

**Habit:** Medium tree

**Habitat:** Evergreen and semi evergreen trees

**Distribution:** Endemic to southern Western Ghats

**Key characters:** Leaves even-pinnate, base cuneate, apex acuminate .

Inflorescence an axillary panicle. Fruit ellipsoid, densely echinate Fruits druoee, ellipsoid. Seeds arillate

**IUCN status:** Locally Rare

**No. of seedlings planted: 1**

24. Scientific Name: *Palaquium bourdilloni* Brandis

**Family:** Sapotaceae

**Habit:** Large tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Fruit edible

**Key characters:** Leaves simple, alternate, spiral, crowded towards the apex, ovate to sublanceolate. Flowers bisexual, creamy white, solitary or in 2-8 flowered axillary clusters. Fruit glabrous, obovoid; seeds 1 or 2, ellipsoid or suborbicular.

**IUCN status:** Endangered (IUCN, 2000)

**No. of seedlings planted: 1**

4. Scientific Name: *Pittosporum neelgherrense* Wight & Arn.

**Family:** Pittosporaceae

**Habit:** Small [trees](#)

**Habitat:** [Evergreen](#) forests

**Distribution:** [Endemic](#) to the southern Western Ghats

**Key characters:** [Leaves simple](#), [Inflorescence](#) few flowered [racemes](#); [flowers](#) yellow; [pedicel](#) up to 1 cm long.

**IUCN status:** Locally Threatened

**No. of seedlings planted: 5**

25. Scientific Name: *Poeciloneuron pauciflorum* Bedd.

**Family:** Bonnetiaceae

**Habit:** Medium tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Medicinal

**Key characters:** Leaves simple, entire or rarely gland-tinged, opposite or sometimes whorled. Flowers bisexual and unisexual, solitary in cymes or thyrses. Fruit berry, septicidal or septifugal, capsule

**IUCN status:** Critically Endangered (IUCN, 2000)

**No. of seedlings planted: 1**

26. Scientific Name: *Polyalthia fragrans* (Dalz.) Bedd.

**Family:** Annonaceae

**Habit:** Large tree

**Habitat:** Semi evergreen and evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Key characters:** [Bark](#) smooth, greenish-grey, [blaze](#) pink. Cluster of [1-seeded berries](#), [ovoid](#).

**IUCN status:** Rare

**No. of seedlings planted: 1**

27. Scientific Name: *Pterospermum rubiginosum* Hey. ex Wt. & Arn.

**Family:** Sterculiaceae

**Habit:** Large tree

**Habitat:** Evergreen and semi evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Uses:** Timber yielding, medicinal

**Key characters:** Leaves simple, ovate-lanceolate, obliquely cordate at base, acuminate at apex, glabrous. Flowers white, solitary, axillary, fragrant. Fruit capsule, glabrous. Bark grayish brown. Flowers axillary. Fruit capsule.

**IUCN status:** Locally threatened (IUCN, 2011)

**No. of seedlings planted:** 3

28. Scientific Name: *Radermachera xylocarpa* (Roxb.) K. Schum.

**Family:** Bignoniaceae

**Habit:** Medium tree

**Habitat:** Dry and moist deciduous forests

**Distribution:** Endemic to Peninsular India

**Uses:** medicine. Timber

**Key characters:** Leaves ovate or elliptic, acuminate, base truncate or obtuse. Fruit capsule. Seeds 1.5cm long including the wings.

**No. of seedlings planted:** 3

29. Scientific Name: *Sageraea laurina* Dalz.

**Family:** Annonaceae

**Habit:** Medium tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to Western Ghats

**Key characters:** Leaves oblong-lanceolate, cuneate or sometimes rounded at base, acute at apex, glabrous. Flowers solitary or in small fascicles on short tubercles below the leaves, sometimes axillary with a few bracts at the base Ripe carpels glabrous.

**IUCN status:** Lower Risk/near threatened (IUCN, 2000)

**No. of seedlings planted:** 2

30. Scientific Name: *Tabernaemontana heyneana* Wall.

**Family:** Apocynaceae

**Habit:** [Trees](#),

**Habitat:** [Evergreen](#) forests and common in moist [deciduous](#) forest

**Distribution:** Endemic to southern Western Ghats

**Key characters:** [Branchlets terete](#), [glabrous](#).

**IUCN status:** Low Risk

**No. of seedlings planted:** 1

31. Scientific Name: *Terminalia travancorensis* Wight & Arn.

**Family:** Combretaceae

**Habit:** Large trees

**Habitat:** Wet Evergreen forests

**Distribution:** Endemic to Western Ghats

**Uses:** Timber

**Key characters:** Trunk with clear bole; bark grey, smooth; blaze brown. Leaves simple, opposite or sub opposite and alternate Inflorescence axillary, paniced spikes, inflorescence axis and pedicel rusty puberulous; flowers white.

**IUCN status:** Locally Rare

**No. of seedlings planted: 5**

32. Scientific Name: *Turpinia malabarica* Gamble

**Family:** Staphyleaceae

**Habit:** Medium tree

**Habitat:** Evergreen forest

**Distribution:** Endemic to south India and Sri Lanka

**Key characters:** Bark greyish- brown. Leaves elliptic or elliptic-lanceolate, acuminate, base rounded, coriaceous. Flowers dull yellow, in axillary or terminal panicles. Fruit berry.

**IUCN status:** Locally Rare

**No. of seedlings planted: 1**

33. Scientific Name: *Vatica chinensis* L.

**Family:** Dipterocarpaceae

**Habit:** Large tree

**Habitat:** Evergreen forests, also planted avenue tree

**Distribution:** Endemic south India & Sri Lanka

**Key characters:** Leaves ovate to lanceolate, base rounded, apex acuminate, Panicles axillart. Fruit indehiscent, subglobose, puberlulous, pericarp coriaceous.

**IUCN status:** Critically Endangered

**No. of seedlings planted: 4**

34. Scientific Name: *Vepris bilocularis* (Wight & Arn.) Engl.

**Family:** Rutaceae

**Habit:** Medium tree

**Habitat:** Ever green and semi evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Key characters:** Leaves 1-3 foliate, alternate, leaflets elliptic- oblong, base cuneate, apex acuminate. Flowers in axillary or terminal, unisexual. Fruits berry, oblong or globose. Seeds 2- grooved.

**IUCN status:** Rare (Nayar, 1997)

**No. of seedlings planted: 2**

35. **Scientific Name:** *Madhuca bourdillonii* (Gamble) H.J. Lam.

**Family:** Sapotaceae

**Habit:** Large tree

**Habitat:** Semi-evergreen forests

**Distribution:** Endemic to southern Western Ghats

**Key characters:** Trees, to 30 m high, bark 6-8 mm thick, surface greyish-brown, shallowly fissured; blaze pink-red; latex milky white; younger branches fulvous tomentose. Leaves simple, alternate, crowded at the tip of branchlets. Fruit a berry, green, smooth, ovoid.

**IUCN status:** Endangered (Nayar, 1997)

**No. of seedlings planted: 4**

36. **Scientific Name:** *Syzygium occidentale* (Bourd.) Gandhi

**Family:** Myrtaceae

**Habit:** Small tree

**Habitat:** Evergreen forests along banks of rivers

**Distribution:** Endemic to southern Western Ghats

**IUCN status:** Vulnerable (Nayar, 1997)

**No. seedlings planted: 2**

37. **Scientific Name:** *Syzygium stocksii* (Duthie) Gamble

**Family:** Myrtaceae

**Habit:** Medium sized tree

**Habitat:** Evergreen forests

**Distribution:** Endemic to southern Western Ghats

**IUCN status:** Endangered (Nayar, 1997)

**No. of seedlings planted: 2**

38. **Scientific Name:** *Hopea racophloea* Dyer in Hook. f.

**Family:** Dipterocarpaceae

**Habit:** Large tree

**Habitat:** Evergreen Forests



**Distribution:** Endemic to Peninsular India

**IUCN Status:** Endangered (Nayar, 1997)

**No. seedlings planted: 2**

39. Scientific Name: *Kingiodendron pinnatum* (Roxb. ex DC.) Harms

**Family:** Caesalpinaceae

**Habit:** Large trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**IUCN status:** Endangered

**No. of seedlings planted: 2**

35. Scientific Name: *Chukrasia tabularis* A. Juss.

**Family:** Meliaceae

**Habit:** Large trees

**Distribution:** Indo-Burma

**Habitat:** Evergreen Forests

**No. of seedlings planted: 5**

36. Scientific Name: *Goniothalamus cardiopetalus* (Dalz.) Hook. f.

**Family:** Annonaceae

**Habit:** Small trees

**Distribution:** Endemic to southern Western Ghats

**Habitat:** Evergreen Forests

**No. of seedlings planted: 1**

37. Scientific Name: *Knema attenuata* (Hook. f. & Thoms.) Warb.

**Family:** Myristicaceae

**Habit:** Small trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to Western Ghats

**No. of seedlings planted: 1**

38. Scientific Name: *Syzygium cumini* (L.) Skeels

**Family:** Myrtaceae

**Habit:** Large trees

**Habitat:** Evergreen and semi evergreen forests, also in the plains

**Distribution:** Indo-Malesia

**No. of seedlings planted: 2**

39. Scientific Name: *Bauhinia phoenicea* Wight & Arn.

**Family:** Caesalpiniaceae

**Habit:** Woody climber

**Local name:** Vallimandaram

**Habitat:** Evergreen Forests

**Distribution:** Endemic to Western Ghats

**No. of seedlings planted: 3**

40. Scientific Name: *Myristica beddomei* King

**Family:** Myristicaceae

**Habit:** Medium trees

**Habitat:** Evergreen Forests

**Local name:** Adakapayin/Kattujathi

**Distribution:** Endemic to Western Ghats & Sri Lanka

**No. of seedlings planted: 1**

41. Scientific Name: *Polyalthia coffeoides* Hook. f. & Thoms.

**Family:** Annonaceae

**Habit:** Medium trees

**Local name:** Nedunar

**Habitat:** Evergreen and semi-evergreen Forests

**Distribution:** Endemic to south India & Sri Lanka

**No. of seedlings planted: 3**

42. Scientific Name: *Nothopegia heyneana* (Hook. f.) Gamble

**Family:** Anacardiaceae

**Habit:** Small trees

**Distribution:** Endemic to Western Ghats

**Habitat:** Evergreen Forests

**No. seedlings planted: 1**

43. Scientific Name: *Beaumontia jerdoniana* Wight

**Family:** Apocynaceae  
**Habit:** Woody Climber  
**Local name:** Swethapushpi  
**Habitat:** Evergreen Forest  
**Distribution:** Endemic to Western Ghats  
**No. of seedlings planted: 2**

44. Scientific Name: *Celastrus paniculatus* Willd.

**Family:** Celastraceae  
**Habit:** Woody climber  
**Local name:** Jyothishmrithy  
**Habitat:** Moist deciduous forest  
**Distribution:** South Asia  
**No. of seedlings planted: 2**

45. Scientific Name: *Kunstleria keralensis* C.N. Mohanan C & N. Nair

**Family:** Fabaceae  
**Habit:** Woody Climber  
**Habitat:** Evergreen forests  
**Distribution:** Endemic to southern Western Ghats (Kerala)  
**IUCN status:** Vulnerable (Nayar, 1997)  
**No. of seedlings planted: 2**

46. Scientific Name: *Syzygium mundagam* (Bourd.) Chithra in Henry

**Family:** Myrtaceae  
**Habit:** Small trees  
**Local name:** Kattuchamba  
**Distribution:** Endemic to southern Western Ghats  
**Habitat:** Evergreen forests  
**No. of seedlings planted: 1**

47. Scientific Name: *Butea monosperma* (Lam.) Taub.

**Family:** Fabaceae  
**Habit:** Small trees  
**Habitat:** Moist deciduous Forest

**Local name:** Plasu/Chamatha

**Distribution:** Tropical Asia

**No. of seedlings planted: 1**

48. Scientific Name: *Erycibe paniculata* Roxb.

**Family:** Convolvulaceae

**Local Name:** Irumbithali/Nakkuvally

**Distribution:** India

**Habit:** Woody Climber

**Habitat:** Semi evergreen forests and Sacred Groves

**No. of seedlings planted: 2**

49. Scientific Name: *Derris brevipes* (Benth.) Baker in Hook. f.

**Family:** Fabaceae

**Local Name:** Pannivally/Nanjuvally

**Habit:** Woody Climber

**Distribution:** Western Ghats

**Habitat:** Evergreen Forest

**No. of seedlings planted: 2**

50. Scientific Name: *Sarcostigma kleinii* Wight & Arn.

**Family:** Icacinaceae

**Local Name:** Odal

**Distribution:** Indo-Malesia

**Habit:** Woody climber

**Habitat:** Evergreen Forests

**No. of seedlings planted: 2**

51. Scientific Name: *Hopea ponga* (Dennst.) Mabb.

**Family:** Dipterocarpaceae

**Local Name:** Nayiruppu/Kambakam

**Distribution:** Endemic to southern Western Ghats

**IUCN status:** Vulnerable

**Habit:** Trees

**Habitat:** Evergreen Forests

**No. of seedlings planted: 3**

52. Scientific Name: ***Vateria indica*** L.

**Family:** Dipterocarpaceae

**Local Name:** Vellapayin

**Distribution:** Endemic to Western Ghats

**Habit:** Trees

**Habitat:** Evergreen Forests

**No. of seedlings planted: 3**

53. Scientific Name: ***Cynometra travancorica*** Bedd.

**Family:** Caesalpiniaceae

**Local Name:** Koori

**IUCN status:** Endangered

**Habit:** Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**No. of seedlings planted: 2**

54. Scientific Name: ***Cynometra beddomei*** Bedd.

**Family:** Caesalpiniaceae

**Local Name:** Cheru Koori

**IUCN status:** Endangered

**Habit:** Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**No. of seedlings planted: 1**

55. Scientific Name: ***Filicium decipiens*** (Wight & Arn.) Thw.

**Family:** Sapindaceae

**Local Name:** Neeroli

**IUCN status:** Endangered

**Habit:** Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats;

**No. of seedlings planted: 1**

56. Scientific Name: ***Humboldtia brunonis*** Wall.



**Family:** Caesalpinaceae

**Local Name:** Katasokam

**Habit:** Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**No. of seedlings planted:** 2

57. Scientific Name: *Memecylon randerianum* SM & MR Almeida

**Family:** Melastomataceae

**Local Name:** Koovachekki

**Habit:** Small Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**No. of seedlings planted:** 5

58. Scientific Name: *Desmos lawii* (Hook. f. & Thoms.) Safford

**Family:** Annonaceae

**Habit:** Woody climbers

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**No. of seedlings planted:** 2

59. Scientific Name: *Cinnamomum malabattrum* (Burm. f.) Blume

**Family:** Lauraceae

**Local Name:** Karappa

**Habit:** Small Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to southern Western Ghats

**No. of seedlings planted:** 7

60. Scientific Name: *Myristica malabarica* Lam.

**Family:** Myristicaceae

**Local Name:** Kattujathi

**Habit:** Medium Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to Western Ghats

**Status:** Vulnerable

**No. of seedlings planted:** 1

61. Scientific Name: *Diospyros paniculata* Dalz.

**Family:** Ebenaceae

**Local Name:** Karumaram

**Habit:** Medium Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to Peninsular India

No. of seedlings planted: 2

62. Scientific Name: *Saraca asoca* (Roxb.) de Wilde.

**Family:** Caesalpinaceae

**Local Name:** Asokam

**Habit:** Small Trees

**Habitat:** Evergreen Forests

**Distribution:** Endemic to Peninsular India

**Status:** Vulnerable

No. of seedlings planted: 5

63. Scientific Name: *Mimusops elengi* L.

**Family:** Sapotaceae

**Habit:** Large trees

**Habitat:** Evergreen Forests

**Local Name:** Ilanji

**No. of seedlings planted:** 3

64. Scientific Name: *Phaeanthus malabaricus* Bedd.

**Family:** Annonaceae

**Habit:** Small trees

**Habitat:** Evergreen forests

**Local Name:** Kunukipanal

**Distribution:** Endemic to southern Western Ghats (Kerala)

**No. of seedlings planted:** 1

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# PAYYANUR COLLEGE, PAYYANUR

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# ഔഷധവനം MEDICINAL TREE CONSERVATION GARDEN

*Jointly with*



**PAYYANUR COLLEGE NSS UNIT 11 - 2016-18**  
**M.S. SWAMINATHAN RESEARCH FOUNDATION**  
**PAYYANUR COLLEGE BIODIVERSITY CLUB**  
**&**  
**DEPT. OF BOTANY, PAYYANUR COLLEGE, PAYYANUR**



Saplings of 100 medicinal tree species used in the traditional Indian systems of medicine including many endemic and endangered species of Western Ghats have been planted and established a 'Medicinal Tree Conservation Garden' (Oushadavanam) at Payyanur College Campus jointly with National Service Scheme unit 11 of Payyanur College, MS Swaminathan Research Foundation, Payyanur Biodiversity Club and Department of Botany. In the garden medicinal trees like Tiphala, Nalpamara, Dasamoola etc. are demonstrated. Planting has been done during November, December, 2016 February, June, July, August, 2017 and June, July 2018.

The garden formally inaugurated on 8th August 2018 by **Rtn. Dr. ANIL KURIAKOSE** (District Chair, Awards, RI Dist. 3202) **Sri. K.RAMACHANDRAN** (President, Payyanur Educational Society) was the Guest of Honour.

### Related Activities

- ◆ Biodiversity Clubs in 10 Schools
- ◆ Nature Camp for Biodiversity Club members
- ◆ Biodiversity Register preparation in selected schools
- ◆ Biodiversity Awareness Classes





## MEDICINAL TREE SPECIES CONSERVED

SI.No.	Scientific name	Common Name
1.	<i>Alangium salviifolium</i> L.	Ankolam
2	<i>Gluta travancorica</i> L.	Chenkurinji
3	<i>Ancistrocladus heyneanus</i> L.	Modiravally
4	<i>Annona reticulata</i> L.	Aaatha
5	<i>Wrightia tinctoria</i> L.	Dhanthapaala
6	<i>Holarrhena pubescens</i> L.	Kudagapaala
7	<i>Oroxylum indicum</i> L.	Palakapayyani
8	<i>Cullenia exarillata</i> L.	Mullanpaali
9	<i>Cordia obliqua</i> L.	Pasakaimaram
10	<i>Lophopetalum wightianum</i> L.	Venkotta
11	<i>Calophyllum austroindicum</i> L.	Kattupunna
12	<i>Calophyllum inophyllum</i> L.	Punna
13	<i>Garcinia gummi-gutta</i> (L.) Robs.	Kudampuli
14	<i>Mesua ferrea</i> L.	Nagamaram
15	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Thanni
16	<i>Terminalia catappa</i> L.	Badam
17	<i>Terminalia cuneata</i> Roth	Neermaruthu
18	<i>Dillenia pentagyna</i> Roxb.	Pattipunna
19	<i>Vateria indica</i> L.	Vellakunthirikam
20	<i>Vatica chinensis</i> L.	Vellapain
21	<i>Diospyros melanoxylon</i> Roxb.	Beediyilamaram
22	<i>Elaeocarpus tuberculatus</i> Roxb.	Badraksham/Mukkanni
23	<i>Aporosa lindleyana</i> (Wight) Baill.	Eachil
24	<i>Baccaurea courtallensis</i> (Wight) Muell.	Mootilpazham
25	<i>Bischofia javanica</i> Blume	Neeli
26	<i>Briedelia retusa</i> (L.) A. Juss.	Mulluvenga
27	<i>Mallotus philippensis</i> (Lam.) Muell.	Sindoori
28	<i>Phyllanthus acidus</i> (L.) Skeels	Arinelli
29	<i>Phyllanthus emblica</i> L.	Nelli
30	<i>Bauhinia purpurea</i> L.	Chuvannamandaram
31	<i>Cassia fistula</i> L.	Kanikonna
32	<i>Humboldtia vahliana</i> Wight	Katasokam
33	<i>Kingiodendron pinnatum</i> Roxb.	Ennapayin
34	<i>Saraca asoca</i> Roxb.	Asokam
35	<i>Tamarindus indica</i> L.	Pulimaram
36	<i>Butea monosperma</i> Lam.	Chamatha/Plasu
37	<i>Pterocarpus marsupium</i> Roxb.	Venga
38	<i>Pterocarpus santalinus</i> L.	Rakthachandanam
39	<i>Hydnocarpus pentandra</i> Buch.	Marotti
40	<i>Flacourtia jangomas</i> Lour.	Chalirpazham/Lavalloika

41	<i>Flacourtia montana</i> Graham	Chalirpazham
42	<i>Nothapodytes nimmoniana</i> Graham	Peenari
43	<i>Actinodaphne bourdillonii</i> Gamble	Mulakunaari
44	<i>Cinnamomum malabattrum</i> Burm. F.	Kattukaruppa
45	<i>Careya arborea</i> Roxb.	Pezhu
45	<i>Couroupita guianensis</i> Aublet	Samudrakaya
46	<i>Strychnos nux-vomica</i> L.	Kaanjiram
47	<i>Fagraea ceilanica</i> Thunb.	Modakam
48	<i>Woodfordia fruticosa</i> (L.) Kurz	Tahthiri
49	<i>Magnolia champaca</i> (L.) Baill.	Chempakam
50	<i>Thespesia populnea</i> L.	Poovarasu
51	<i>Memecylon randerianum</i> SM	Katukasavu
52	<i>Memecylon edule</i> Roxb.	Kayampoo
53	<i>Azadirachta indica</i> A.Juss.	Veppu
54	<i>Dysoxylum malabaricum</i> Bedd.	Akil
55	<i>Melia dubia</i> Cav.	Malaveppu
56	<i>Trichilia connaroides</i> Wight	Kurangatti
57	<i>Artocarpus heterophyllus</i> Lam.	Plavu
58	<i>Artocarpus hirsutus</i> Lam.	Anjili
59	<i>Manjifera indica</i> L.	Mavu
60	<i>Ficus benghalensis</i> L.	Peral
61	<i>Ficus racemosa</i> L.	Athi
62	<i>Ficus religiosa</i> L.	Arayal
63	<i>Ficus auriculata</i> Lour.	Seemaathi
64	<i>Ficus microcarpa</i> L.	Ithi
65	<i>Pimenta dioica</i> L.	Sarvasugandhi
66	<i>Psidium guajava</i> L.	Pera
67	<i>Syzygium aqueum</i> Burm.f.	Chamba
68	<i>Syzygium cumini</i> L.	Njaval
69	<i>Syzygium malaccense</i> L.	Apple Chamba
70	<i>Syzygium zeylanicum</i> (L.) DC.	Poochapazham
71	<i>Chionanthus mala-elengi</i> Dennst.	Malaelenji
72	<i>Olea dioica</i> Roxb.	Edala
73	<i>Averrhoa bilimbi</i> L.	Bilumbi
74	<i>Averrhoa carambola</i> L.	Carambola
75	<i>Carallia brachiata</i> (Lour.) Merr.	Venkana
76	<i>Acronychia pedunculata</i> (L.) Miq.	Kanali
77	<i>Aegle marmelos</i> (L.) Correa	Koovalam
78	<i>Citrus limon</i> (L.) Burm. f.	Naragam
79	<i>Clausena indica</i> (Dalz.) Oliver	Kattukariveppu
80	<i>Melicope lunu-ankenda</i> Gaertn.	Kambilimaram



81	<i>Naringi crenulata</i> Roxb.	Naringi
82	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	Kuyitti
83	<i>Santalum album</i> L.	Chandanam
84	<i>Dimocarpus longan</i> Lour.	Malampoovam
85	<i>Schleichera oleosa</i> Lour.	Poovam
86	<i>Palaquium ellipticum</i> Dalz.	Paali
87	<i>Mimusops elengi</i> L.	Elengi
88	<i>Simarouba glauca</i> DC.	Laksmitharu
89	<i>Quassia indica</i> (Gaertn.) Nootb.	Karinjotta
90	<i>Turpinia malabarica</i> Gamble	Koori
91	<i>Pterospermum rubiginosum</i> Heyne	Ellootti
92	<i>Pterospermum reticulatum</i> Wight	Malavuram
93	<i>Sterculia guttata</i> Roxb.	Naripedukku
94	<i>Symplocos cochinchinensis</i> Lour.	Pachotti
95	<i>Gmelina arborea</i> Roxb.	Kumizhu
96	<i>Alstonia scholaris</i> L.	Ezhilampala
97	<i>Tabernaemontana heyneana</i> L.	Koonampala
98	<i>Caryota urens</i> L.	Pana
99	<i>Arenga wightii</i> L.	Njetipana
100	<i>Hopea ponga</i> L.	Attirupe



*Giving breath to dying wealth*

# Planting 2016 November onwards



*Giving Breath to  
Dying Wealth*



# Inauguration - on 8th August 2018

Inaugurated by **Rtn. Dr. ANIL KURIAKOSE** (District Chair, Awards, RI Dist. 3202) and **Sri. K.RAMACHANDRAN** (President, Payyanur Educational Society) was the Guest of Honour.



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# സഞ്ജീവനി

## HERBAL GARDEN

## DEPT. OF BOTANY, PAYYANUR COLLEGE, PAYYANUR

*Supported by*

**ROTARY CLUB OF PAYYANUR**





**A herbal garden (SANJEEVANI) has been established in about 1 acres in the Botany Department premises including a Green House. More than 200 species of medicinal plants used in the traditional Indian system of medicine including many endemic and endangered species of Western Ghats are conserved here.**

1	<i>Andrographis atropurpurea</i> (Dennst.) Alston	Kattu Kiriyaath	ACANTHACEAE
2	<i>Andrographis paniculata</i> (Burm. f.) Wall.	Kiriyaath	ACANTHACEAE
3	<i>Asystasia gangetica</i> (L.) Anders	Uppiliyam	ACANTHACEAE
4	<i>Asystasia crispata</i> Benth.	Kattuvilipadakam	ACANTHACEAE
5	<i>Blepharis maderaspatensis</i> (L.) Roth	Murikooti	ACANTHACEAE
6	<i>Clinacanthus nutans</i> Lind.	Vishamooli	ACANTHACEAE
7	<i>Hemigraphis colorata</i> Hallier f.	Murikooti	ACANTHACEAE
8	<i>Hygrophila ringens</i> (L.) Steud.	Kozhimullan	ACANTHACEAE
9	<i>Hygrophila schulli</i> (Buch.-Ham.) M. R	Vayalchulli	ACANTHACEAE
10	<i>Justicia adhatoda</i> L.	Adalodakam	ACANTHACEAE
11	<i>Justicia gendarussa</i> Burm. f.	Vathamkolli	ACANTHACEAE
12	<i>Ruellia tuberosa</i> L.	Velipadakam	ACANTHACEAE
13	<i>Strobilanthes ciliatus</i> Nees	Karikurinj	ACANTHACEAE
14	<i>Achyranthes aspera</i> L.	Kadalady	AMARANTHACEAE
15	<i>Aerva lanata</i> (L.) Juss.	Cheroola	AMARANTHACEAE
16	<i>Alternanthera brasiliana</i> (L.) Kuntze	Choracheera	AMARANTHACEAE
17	<i>Alternanthera sessilis</i> (L.) R. Br.	Ponnamkanni	AMARANTHACEAE
18	<i>Amaranthus hybridus</i> L.	Pachacheera	AMARANTHACEAE
19	<i>Amaranthus spinosus</i> L.	Mullancheera	AMARANTHACEAE
20	<i>Amaranthus viridis</i> L.	Kuppacheera	AMARANTHACEAE
21	<i>Cyathula prostrata</i> (L.) Blume	Cherukadalady	AMARANTHACEAE
22	<i>Uvaria narum</i> (Dunal) Wall.	Narampanal	ANNONACEAE
23	<i>Centella asiatica</i> (L.) Urban	Muthil	APIACEAE
24	<i>Eryngium foetidum</i> L.	Mysoremalli	APIACEAE
25	<i>Ichnocarpus frutescens</i> (L.) R. Br.	Palvally	APOCYNACEAE
26	<i>Rauvolfia tetraphylla</i> L.	Kattugandhi	APOCYNACEAE
27	<i>Rauvolfia serpentina</i> (L.) Benth.	Sarpagandhi	APOCYNACEAE
28	<i>Acorus calamus</i> L.	Vayambu	ARACEAE
29	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Kattuchena	ARACEAE
30	<i>Cryptocoryne retorspiralis</i> (Roxb.) Kunth	Palancheera	ARACEAE
31	<i>Pothos scandens</i> L.	Pothuvaly	ARACEAE
32	<i>Aristolochia indica</i> L.	Urithooki	ARISTOLOCHIACEAE
33	<i>Thottea siliquosa</i> (Lam.) Ding	Alpam	ARISTOLOCHIACEAE
34	<i>Wattakaka volubilis</i> (L. f.) Stapf	Vattakakka	ASCLEPIADACEAE
35	<i>Cosmostigma racemosum</i> (Roxb.) Wight	Kakkavally	ASCLEPIADACEAE
36	<i>Heliotropium indicum</i> L.	Thekkada	BORAGINACEAE
37	<i>Cleome viscosa</i> L.	Kattukaduku	CAPPARACEAE
38	<i>Celastrus paniculatus</i> Willd.	Kilithenipanji	CELASTRACEAE
39	<i>Evolvulus nummularius</i> (L.) L.	Vishnukranthi	CONVOLVULACEAE
40	<i>Xenostegia tridentata</i> (L.) Austin	Prasarani	CONVOLVULACEAE
41	<i>Costus speciosus</i> (Koenig) J.E.	Channakoova	COSTACEAE
42	<i>Costus pictus</i> D. Don	Insulinpacha	COSTACEAE
43	<i>Sansevieria roxburghiana</i> Schult.	Katukapel	DRACAENACEAE
44	<i>Baliospermum montanum</i> (Willd.) Muell.	Nagadhanthi	EUPHORBACEAE
45	<i>Euphorbia hirta</i> L.	Kuzhinagapala	EUPHORBACEAE
46	<i>Euphorbia tirucalli</i> L.	Thirucalli	EUPHORBACEAE
47	<i>Jatropha curcas</i> L.	Kadalavanaku	EUPHORBACEAE

48	<i>Phyllanthus amarus</i> Schum.	Keezharnelli	EUPHORBIACEAE
49	<i>Ricinus communis</i> L.	Avanakuu	EUPHORBIACEAE
50	<i>Senna alata</i> (L.) Roxb.	Anathakara	FABACEAE
51	<i>Senna tora</i> (L.) Roxb.	Thakara	FABACEAE
52	<i>Mimosa pudica</i> L.	Thottavady	FABACEAE
53	<i>Clitoria ternatea</i> L.	Sangupushpam	FABACEAE
54	<i>Desmodium gangeticum</i> (L.) DC.	Orila	FABACEAE
55	<i>Desmodium triflorum</i> (L.) DC.	Nilamparnda	FABACEAE
56	<i>Desmodium triquetrum</i> (L.) DC.	Orila	FABACEAE
57	<i>Curculigo orchioides</i> Gaertn.	Nilapana	HYPOXIDACEAE
58	<i>Hyptis suaveolens</i> L.	Naarikadu	LAMIACEAE
59	<i>Leucas aspera</i> Willd.	Thumba	LAMIACEAE
60	<i>Mentha arvensis</i> L.	Puthina	LAMIACEAE
61	<i>Ocimum sanctum</i> L.	Krishnathulasi	LAMIACEAE
62	<i>Ocimum basilicum</i> L.	Ramathulasi	LAMIACEAE
63	<i>Orthosiphon stamineus</i> Benth.	Poochameesa	LAMIACEAE
64	<i>Coleus aromaticus</i> Benth.	Panikoorkka	LAMIACEAE
65	<i>Coleus zeylanica</i> Benth	Iruveli	LAMIACEAE
66	<i>Leea indica</i> Burm.	Nankku	LEEACEAE
67	<i>Aloe vera</i> L.	Kattarvaazha	LILIACEAE
68	<i>Asparagus racemosus</i> Willd.	Sathavary	LILIACEAE
69	<i>Gloriosa superba</i> L.	Menthanni	LILIACEAE
70	<i>Lobelia nicotianifolia</i> Roth	Kattupugayila	LOBELIACEAE
71	<i>Abelmoschus moschatus</i> Medik.	Kasthoorivenda	MALVACEAE
72	<i>Hibiscus hispidissimus</i> Griff.	Paichapuli	MALVACEAE
73	<i>Sida beddomei</i> Jacob	Vallikurunthotti	MALVACEAE
74	<i>Sida rhombifolia</i> L.	Kurunthootti	MALVACEAE
75	<i>Sida acuta</i> Burm. f.	Anakurunthotti	MALVACEAE
76	<i>Maranta arundinacea</i> L.	Koova	MARANTACEAE
77	<i>Memecylon randerianum</i> SM	Kattukasavu	MELASTOMATACEAE
78	<i>Tinospora cordifolia</i> Willd.	Chittamruthu	MENISPERMACEAE
79	<i>Tinospora sinensis</i> Lour.	Anamruthu	MENISPERMACEAE
80	<i>Embelia tsjeriam-cottam</i> Roem.	Kattucheera	MYRSINACEAE
81	<i>Boerhavia diffusa</i> L.	Thazhuthama	NYCTAGINACEAE
82	<i>Oxalis corniculata</i> L.	Puliyarila	OXALIDACEAE
83	<i>Biophytum reinwardtii</i> Zucc.	Mukkutti	OXALIDACEAE
84	<i>Pandanus amaryllifolius</i> Roxb.	Ramba	PANDANACEAE
85	<i>Plumbago zeylanica</i> L.	Vellakoduveli	PLUMBAGINACEAE
86	<i>Plumbago indica</i> L.	Chethikoduveli	PLUMBAGINACEAE
87	<i>Talinum portulacifolium</i> Forssk.	Sambarcheera	PORTULACACEAE
88	<i>Chassalia curviflora</i> Wall.	Amalपुरi	RUBIACEAE
89	<i>Cardiospermum halicacabum</i> L.	Uzhinja	SAPINDACEAE
90	<i>Bacopa monnieri</i> L.	Brahmi	SCROPHULARIACEAE
91	<i>Datura metel</i> L.	Ummam	SOLANACEAE
92	<i>Physalis minima</i> L.	Mottampuli	SOLANACEAE
93	<i>Solanum capsicoides</i> All.	Kattuchunda	SOLANACEAE
94	<i>Solanum torvum</i> Sw.	Anachunda	SOLANACEAE
95	<i>Vitex negundo</i> L.	Karinochi	VERBENACEAE
96	<i>Cissus quadrangularis</i> L.	Chnaglamparanda	VITACEAE
97	<i>Alpinia calcarata</i> Rosc.	Chittaratha	ZINGIBERACEAE
98	<i>Cleome burmannii</i> Wight	Kattukaduku	CAPPARACEAE
99	<i>Ipomoea pes-tigridis</i> L.	Pullichuvadi	CONVOLVULACEAE
100	<i>Ipomoea obscura</i> (L.) Ker-Gawl.	Thiruthali	CONVOLVULACEAE



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# ജോൺസിവനം

CONSERVATION GARDEN FOR ENDEMIC TREES OF WESTERN GHATS

*Jointly with*



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**M.S. SWAMINATHAN RESEARCH FOUNDATION**

**&**

**DEPT. OF BOTANY, PAYYANUR COLLEGE, PAYYANUR**



## 'SHANTHISTHAL' (JOHNCYVANAM) 2013-2018

In Collaboration with Kerala State Biodiversity Board and with the technical support of Department of Botany and M. S. Swaminathan Research Foundation Payyanur college Biodiversity Club established a conservation garden ('Shanthisthal') of Rare Endemic and Threatened flowering plants (RET plants) at Payyanur college campus in 1 acre area. Two hundred and thirty seven seedlings of 71 species of Rare Endemic and Threatened (RET) flowering plants (Angiosperms) of the Western Ghats coming in 29 families have been planted and conserved in the garden. Dr. P.S. Easa, former Director of Kerala Forest Research Institute formally inaugurated the garden as 'Johncyvanam' on 21<sup>st</sup> October, 2016 (in the name of Prof. Johncy Jacob, former professor of Department of Zoology, Payyanur College) and dedicated to the founders and retired teachers of Payyanur College.

More than 65% of these species are coming under various threat categories of IUCN (Nayar, 1997). Among these *Vatica chinensis*, *Poeciloneuron pauciflorum*, *Nothopogia heyneana* and *Aglaiia malabarica* are 'Critically Endangered' (CR) tree species and *Syzygium occidentale*, *Kunstleria keralensis*, *Saraca asoca*, *Myristica malabarica* and *Palaquium bourdillonii* listed as 'Vulnerable' (VU). Nine tree species like *Dipterocarpus indicus*, *Hopea parviflora*, and *Syzygium stocksii* are coming under the category "Endangered" (E). *Humboldtia vahliana* *Vepris bilocularis*, *Phaeanthus malabaricus* and *Actinodaphne malabarica* are coming under the 'Rare' (R) category of IUCN Red Data Book. Thirteen plants are coming under the IUCN category of 'Locally Rare'. Some of them are *Baccaurea courtallensis*, *Cullenia exarillata*, *Diospyros pruriens*, *Flacourtia montana*, *Otonophelium stipulaceum*, *Artocarpus hirsutus*, and *Cinnamomum sulphuratum*. *Gluta travancorica*, and *Sageraea laurina* are coming under the category of 'Lower Risk' or 'Near Threatened'. *Mesua thwaitesii* is listed under the category "Locally Restricted". *Aporosa lindleyana*, *Elaeocarpus serratus* var. *weibelii*, *Lagerstroemia microcarpa*, *Polyalthia fragrans*, and *Radermachera xylocarpa* etc. are some of the common endemic tree species of the Western Ghats that are conserved in the garden.

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## Western Ghats Endemic flowering plant species planted in the Payyanur College 'Johncy Vanam'

SL. No	Scientific name	Local Name	Family	Status
1.	<i>Actinodaphne malabarica</i> Balakr.	Pattuthalli	Lauraceae	R
2.	<i>Aglaia malabarica</i> Sasisdh.	Chuvanna Cheeralam	Meliaceae	CR
3.	<i>Aporosa lindeleyana</i>	Vetti	Euphorbiaceae	
4.	<i>Artocarpus hirsutus</i> Lam.	Anjili	Moraceae	
5.	<i>Baccaurea courtallensis</i> (Wight) Muell.	Mootilpazham	Euphorbiaceae	
6.	<i>Calophyllum austroindicum</i> Kosterm.	Cholappunna	Clusiaceae	
7.	<i>Cinnamomum malabratrum</i>	Karappa	Lauraceae	
8.	<i>Cinnamomum sulphuratum</i> Nees.	Kattukaruva	Lauraceae	
9.	<i>Cullenia exarillata</i> Robyns	Mullanpali	Bombacaceae	
10.	<i>Cyathocalyx zeylanica</i> Champ. ex Hook. f. & Thoms.	Kodavazha	Annonaceae	
11.	<i>Dillenia bracteata</i> Wight	Kattupunna	Dilleniaceae	
12.	<i>Diospyros paniculata</i> Dalz.	Karivella	Ebenaceae	
13.	<i>Diospyros pruriens</i> Dalz.	Illakkatta	Ebenaceae	
14.	<i>Dipterocarpus indicus</i> Bedd.	Kalpayin	Dipterocarpaceae	EN
15.	<i>Elaeocarpus serratus</i> L. var. <i>weibelii</i> Zmarzty	Badraksham	Elaeocarpaceae	
16.	<i>Filicium decipens</i> (Wight & Arn.) Thw.	Irumbarakki	Spaindeaceae	
17.	<i>Flacourtia montana</i> Graham	Chalir	Flacourtiaceae	
18.	<i>Gluta travancorica</i> Bedd.	Chenkurinji	Anacardiaceae	LRNT
19.	<i>Goniothalamus cardiopetalus</i> Bedd.	-	Annonaceae	
20.	<i>Hopea ponga</i> (Bedd.) van Sloot.,	Eeyakam	Dipterocarpaceae	EN
21.	<i>Hopea parviflora</i> Bedd	Irumbakam	Dipterocarpaceae	EN
22.	<i>Hopea racophloea</i> Dyer in Hook. f.	Nadualipongu	Dipterocarpaceae	EN
23.	<i>Humboldtia brunoniana</i>	Kattashokam	Caesalpiniaceae	
24.	<i>Humboldtia vahliana</i> Wight	Attuvanchi	Caesalpiniaceae	R
25.	<i>Knema attenuate</i>	Chorapayin	Myristicaceae	
26.	<i>Hydnocarpus pentandra</i> (Buch.-Ham.) Oken	Marotti	Flacourtiaceae	

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27.	<i>Lagerstroemia microcarpa</i> Wight	Venthekku	Lythraceae	
28.	<i>Mastixia arborea</i> (Wight) Bedd.	Vella adambu	Cornaceae	
29.	<i>Mesua thwaitesii</i> Planch. & Triana	Nangu	Clusiaceae	
30.	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz	Palakapayyani	Bignoniaceae	
31.	<i>Otonephelium stipulaceum</i> (Bedd.) Radlk.	Poripoovam	Sapindaceae	
32.	<i>Palaquium bourdillonii</i> Brandis	Pali	Sapotaceae	VU
33.	<i>Pittosporum neelgherrense</i> Wight & Arn.	Analivegam	Pittosporaceae	
34.	<i>Poeciloneuron pauciflorum</i> Bedd.	Pulivayila	Clusiaceae	CR
35.	<i>Polyalthia fragrans</i> (Dalz.) Bedd.	Nedunar	Annonaceae	
36.	<i>Pterospermum rubiginosum</i> Heyne.	Ellootti	Sterculiaceae	
37.	<i>Radermachera xylocarpa</i> (Roxb.) K.	Pambukaimara	Bignoniaceae	
38.	<i>Sageraea laurina</i> Dalz.	Kanakaitha	Annonaceae	LRNT
39.	<i>Tabernaemontana heyneana</i> Wall	Koonanpala	Apocynaceae	
40.	<i>Terminalia travancorensis</i> Wight & Arn.	Kattukadukka	Combretaceae	
41.	<i>Turpinia malabarica</i> Gamble	Aluknumaram	Staphyleaceae	
42.	<i>Vateria indica</i>	Vellapayin		
43.	<i>Vatica chinensis</i> L.	Adakkapayin	Dipterocarpaceae	CR
44.	<i>Vepris bilocularis</i> (Wight & Arn.) Engl.	Moothasari	Rutaceae	R
45.	<i>Madhuca bourdillonii</i> (Gamble) H.J. Lam.	Thandidiyan	Sapotaceae	EN
46.	<i>Syzygium occidentale</i> (Bourd.) Gandhi	Attuchamba	Myrtaceae	VU
47.	<i>Syzygium stocksii</i> (Duthie) Gamble	Kollinjaval	Myrtaceae	EN
48.	<i>Syzygium mundagam</i> (Bourd.) Chithra	Kattuchamba	Myrtaceae	
49.	<i>Syzygium cumini</i> L.	Njaval	Myrtaceae	
50.	<i>Kingiodendron pinnatum</i> (Roxb. ex DC.) Harms	Ennapayin	Caesalpiniaceae	EN
51.	<i>Chukrasia tabularis</i> A. Juss.	Chuvanna Akil	Meliaceae	
52.	<i>Myristica beddomei</i> King	Kattujathi	Myristicaceae	
53.	<i>Myristica malabarica</i> Lam.	Kattujathi	Myristicaceae	VU
54.	<i>Cynometra beddomei</i> Prain	Cherukoori	Caesalpiniaceae	EN
55.	<i>Cynometra travancorica</i> Bedd.	Koori	Caesalpiniaceae	EN

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56.	<i>Polyalthia coffeoides</i> L.	Nedunar	Annonaceae	
57.	<i>Phaeanthus malabaricus</i> Bedd.	Kunukipanal	Annonaceae	Rare
58.	<i>Nothopegia heyneana</i> (Hook. f.) Gamble	Kattucheru	Anacardiaceae	CR
59.	<i>Saraca asoca</i> (Roxb.) de Wilde	Asokam	Caesalpiniaceae	VU
60.	<i>Mimusops elengi</i> L.	Elenji	Sapotaceae	
61.	<i>Schleichera oleosa</i> (Lour.) Oken	Poovam	Sapindaceae	
62.	<i>Memecylon randerianum</i> SM	Koovachekki	Melastomataceae	
63.	<i>Desmos lawii</i> (Hook. f. & Thoms.) Safford		Annonaceae	
64.	<i>Bauhinia phoenicea</i> Wight & Arn.	Vallimandaram	Caesalpiniaceae	
65.	<i>Beaumontia jerdoniana</i> Wight	Swedapushpi	Apocynaceae	
66.	<i>Celastrus paniculatus</i> Willd.	Jyothishmrithi	Celastraceae	
67.	<i>Kunstleria keralensis</i> Mohanan	Mutharivalli	Fabaceae	VU
68.	<i>Erycibe paniculata</i> Roxb.	Erumathali	Convolvulaceae	
69.	<i>Sarcostigma kleinii</i> Wight & Arn.	Odal	Icacinaceae	
70.	<i>Derris brevipes</i> (Benth.) Baker	Pannivalli	Fabaceae	

EN\_ Endangered; CR\_ Critically Endangered; VU\_ Vulnerable;  
R\_ Rare; LRNT\_ Lower Risk /Near Threatened.



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## SPECIES DETAILS



Total  
107

Total number of species reported from this region



Migratory  
15

Total number of migratory bird species reported from this region



Threatened  
3

Number of bird species that are listed as globally threatened as per IUCN [IUCN](#)



High Priority  
0

Number of bird species that are listed as High Conservation Priority in [State of India's Birds](#)



Schedule I  
8

Number of bird species that are listed in Schedule 1 of the [Wild Life \(Protection\) Amendment Act \(WLPA\)](#)



Endemic  
5

Number of bird species that are endemic to India

### SoIB Conservation Priority Species

High Priority	0
Moderate Priority	13

### CITES Appendix Species

Appendix I	0
Appendix II	13

### CMS Appendix Species

Appendix I	0
Appendix II	36

## IUCN RED LIST



Critically Endangered  
0



Endangered  
0



Vulnerable  
0



Near Threatened  
3

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

## IUCN RED LIST SPECIES

Species	IUCN Status	Frequency of Reporting
Woolly-necked Stork <i>Ciconia episcopus</i>	Near Threatened	1%
Oriental Darter <i>Anhinga melanogaster</i>	Near Threatened	1%
Black-headed Ibis <i>Threskiornis melanocephalus</i>	Near Threatened	2%

## ENDEMIC SPECIES

Species	Endemic Region	Frequency of Reporting
Indian Peafowl <i>Pavo cristatus</i>	Indian Subcontinent	6%
Red Spurfowl <i>Galloperdix spadicea</i>	Mainland India	21%
Blue-faced Malkoha <i>Phaenicophaeus viridirostris</i>	Indian Subcontinent	17%
Grey-bellied Cuckoo <i>Cacomantis passerinus</i>	Indian Subcontinent	1%
Common Hawk Cuckoo <i>Hierococcyx varius</i>	Indian Subcontinent	8%
Jerdon's Nightjar <i>Caprimulgus atripennis</i>	Indian Subcontinent	10%
Yellow-wattled Lapwing <i>Vanellus malabaricus</i>	Indian Subcontinent	12%
Indian Scops Owl <i>Otus bakkamoena</i>	Indian Subcontinent	<1%

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

ENDEMIC SPECIES		
Species	Endemic Region	Frequency of Reporting
Jungle Owlet <i>Glaucidium radiatum</i>	Indian Subcontinent	1%
White-cheeked Barbet <i>Psilopogon viridis</i>	Mainland India	46%
Brown-capped Pygmy Woodpecker <i>Yungipicus nanus</i>	Indian Subcontinent	4%
Black-rumped Flameback <i>Dinopium benghalense</i>	Indian Subcontinent	21%
Plum-headed Parakeet <i>Psittacula cyanocephala</i>	Indian Subcontinent	4%
Indian Pitta <i>Pitta brachyura</i>	Indian Subcontinent	6%
Orange Minivet <i>Pericrocotus flammeus</i>	Indian Subcontinent	2%
Black-headed Cuckooshrike <i>Lalage melanoptera</i>	Indian Subcontinent	1%
Malabar Woodshrike <i>Tephrodornis sylvicola</i>	Western Ghats	2%
Jerdon's Bushlark <i>Mirafra affinis</i>	Indian Subcontinent	16%
Ashy Prinia <i>Prinia socialis</i>	Indian Subcontinent	1%
White-browed Bulbul <i>Pycnonotus luteolus</i>	Indian Subcontinent	43%
Yellow-browed Bulbul <i>Acritillas indica</i>	Western Ghats & Sri Lanka	10%

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

ENDEMIC SPECIES		
Species	Endemic Region	Frequency of Reporting
Rufous Babbler <i>Argya subrufa</i>	Western Ghats	12%
Jungle Babbler <i>Argya striata</i>	Indian Subcontinent	6%
Yellow-billed Babbler <i>Argya affinis</i>	Indian Subcontinent	59%
Malabar Starling <i>Sturnia blythii</i>	Western Ghats	1%
Indian Robin <i>Copsychus fulicatus</i>	Indian Subcontinent	29%
Tickell's Blue Flycatcher <i>Cyornis tickelliae</i>	Indian Subcontinent	1%
Pale-billed Flowerpecker <i>Dicaeum erythrorhynchos</i>	Indian Subcontinent	9%
Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	Indian Subcontinent	50%
Loten's Sunbird <i>Cinnyris lotenius</i>	Indian Subcontinent	10%
Jerdon's Leafbird <i>Chloropsis jerdoni</i>	Indian Subcontinent	3%
White-browed Wagtail <i>Motacilla maderaspatensis</i>	Indian Subcontinent	1%



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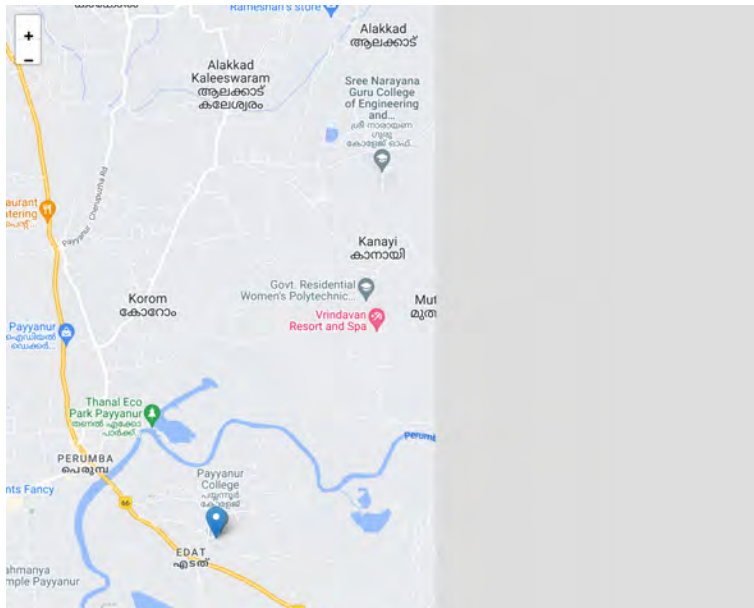
## MOST COMMON SPECIES



# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur



Top Hotspots	No of Species
Payyanur College	105

## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Lesser Whistling Duck <i>Dendrocygna javanica</i>	Low	Least Concern	None	Schedule-II
Indian Peafowl <i>Pavo cristatus</i>	Low	Least Concern	Indian Subcontinent	Schedule-I
Red Spurfowl <i>Galloperdix spadicea</i>	Low	Least Concern	Mainland India	Schedule-II
Rock Pigeon <i>Columba livia</i>	Low	Least Concern	None	Not protected
Spotted Dove <i>Spilopelia chinensis</i>	Low	Least Concern	None	Schedule-II
Yellow-footed Green Pigeon <i>Treron phoenicopterus</i>	Low	Least Concern	None	Schedule-II
Greater Coucal <i>Centropus sinensis</i>	Low	Least Concern	None	Schedule-II
Blue-faced Malkoha <i>Phaenicophaeus viridirostris</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Asian Koel <i>Eudynamys scolopaceus</i>	Low	Least Concern	None	Schedule-II

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Grey-bellied Cuckoo <i>Cacomantis passerinus</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Common Hawk Cuckoo <i>Hierococcyx varius</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Jerdon's Nightjar <i>Caprimulgus atripennis</i>	NA	Least Concern	Indian Subcontinent	Schedule-II
Little Swift <i>Apus affinis</i>	Low	Least Concern	None	Schedule-II
Asian Palm Swift <i>Cypsiurus balasiensis</i>	Low	Least Concern	None	Schedule-II
Yellow-wattled Lapwing <i>Vanellus malabaricus</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Red-wattled Lapwing <i>Vanellus indicus</i>	Low	Least Concern	None	Schedule-II
Asian Openbill <i>Anastomus oscitans</i>	Low	Least Concern	None	Schedule-II
Woolly-necked Stork <i>Ciconia episcopus</i>	Moderate	Near Threatened	None	Schedule-II
Oriental Darter <i>Anhinga melanogaster</i>	Low	Near Threatened	None	Schedule-II
Little Cormorant <i>Microcarbo niger</i>	Low	Least Concern	None	Schedule-II
Purple Heron <i>Ardea purpurea</i>	Low	Least Concern	None	Schedule-II
Little Egret <i>Egretta garzetta</i>	Low	Least Concern	None	Schedule-II
Cattle Egret <i>Bubulcus ibis</i>	Low	Least Concern	None	Schedule-II
Indian Pond Heron <i>Ardeola grayii</i>	Low	Least Concern	None	Schedule-II



# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Black-headed Ibis <i>Threskiornis melanocephalus</i>	Low	Near Threatened	None	Schedule-II
Oriental Honey Buzzard <i>Pernis ptilorhynchus</i>	Low	Least Concern	None	Schedule-II
Crested Serpent Eagle <i>Spilornis cheela</i>	Low	Least Concern	None	Schedule-I
Booted Eagle <i>Hieraaetus pennatus</i>	Low	Least Concern	None	Schedule-I
Crested Goshawk <i>Accipiter trivirgatus</i>	Moderate	Least Concern	None	Schedule-I
Shikra <i>Accipiter badius</i>	Low	Least Concern	None	Schedule-I
Eurasian Sparrowhawk <i>Accipiter nisus</i>	Low	Least Concern	None	Schedule-I
Black Kite <i>Milvus migrans</i>	Low	Least Concern	None	Schedule-II
Brahminy Kite <i>Haliastur indus</i>	Low	Least Concern	None	Schedule-I
Indian Scops Owl <i>Otus bakkamoena</i>	NA	Least Concern	Indian Subcontinent	Schedule-II
Jungle Owlet <i>Glaucidium radiatum</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Spotted Owlet <i>Athene brama</i>	NA	Least Concern	None	Schedule-II
White-throated Kingfisher <i>Halcyon smyrnensis</i>	Low	Least Concern	None	Schedule-II
Green Bee-eater <i>Merops orientalis</i>	Low	Least Concern	None	Schedule-II
Blue-tailed Bee-eater <i>Merops philippinus</i>	Low	Least Concern	None	Schedule-II

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

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## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Indian Roller <i>Coracias benghalensis</i>	Moderate	Least Concern	None	Schedule-II
Coppersmith Barbet <i>Psilopogon haemacephalus</i>	Low	Least Concern	None	Schedule-II
White-cheeked Barbet <i>Psilopogon viridis</i>	Low	Least Concern	Mainland India	Schedule-II
Eurasian Wryneck <i>Jynx torquilla</i>	Low	Least Concern	None	Schedule-II
Brown-capped Pygmy Woodpecker	Moderate	Least Concern	Indian Subcontinent	Schedule-II
Black-rumped Flameback <i>Dinopium benghalense</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Rose-ringed Parakeet <i>Psittacula krameri</i>	Low	Least Concern	None	Schedule-II
Plum-headed Parakeet <i>Psittacula cyanocephala</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Vernal Hanging Parrot <i>Loriculus vernalis</i>	Low	Least Concern	None	Schedule-II
Indian Pitta <i>Pitta brachyura</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Small Minivet <i>Pericrocotus cinnamomeus</i>	Low	Least Concern	None	Schedule-I
Orange Minivet <i>Pericrocotus flammeus</i>	Moderate	Least Concern	Indian Subcontinent	Schedule-II
Large Cuckooshrike <i>Coracina macei</i>	Moderate	Least Concern	None	Schedule-II
Black-headed Cuckooshrike <i>Lalage melanoptera</i>	Low	Least Concern	Indian Subcontinent	Schedule-II

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

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## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Indian Golden Oriole <i>Oriolus kundoo</i>	Low	Least Concern	None	Schedule-II
Black-hooded Oriole <i>Oriolus xanthornus</i>	Low	Least Concern	None	Schedule-II
Ashy Woodswallow <i>Artamus fuscus</i>	Low	Least Concern	None	Schedule-II
Malabar Woodshrike <i>Tephrodornis sylvicola</i>	Moderate	Least Concern	Western Ghats	Schedule-II
Common Woodshrike <i>Tephrodornis pondicerianus</i>	Moderate	Least Concern	None	Schedule-II
Common Iora <i>Aegithina tiphia</i>	Low	Least Concern	None	Schedule-II
Black Drongo <i>Dicrurus macrocercus</i>	Low	Least Concern	None	Schedule-II
Ashy Drongo <i>Dicrurus leucophaeus</i>	Low	Least Concern	None	Schedule-II
Bronzed Drongo <i>Dicrurus aeneus</i>	Low	Least Concern	None	Schedule-II
Greater Racket-tailed Drongo <i>Dicrurus paradiseus</i>	Low	Least Concern	None	Schedule-II
Black-naped Monarch <i>Hypothymis azurea</i>	Low	Least Concern	None	Schedule-II
Indian Paradise-flycatcher <i>Terpsiphone paradisi</i>	Low	Least Concern	None	Schedule-II
Brown Shrike <i>Lanius cristatus</i>	Low	Least Concern	None	Schedule-II
Rufous Treepie <i>Dendrocitta vagabunda</i>	Low	Least Concern	None	Schedule-II
House Crow <i>Corvus splendens</i>	Low	Least Concern	None	Not protected

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Large-billed Crow <i>Corvus macrorhynchos</i>	Low	Least Concern	None	Schedule-II
Jerdon's Bushlark <i>Mirafra affinis</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Common Tailorbird <i>Orthotomus sutorius</i>	Low	Least Concern	None	Schedule-II
Grey-breasted Prinia <i>Prinia hodgsonii</i>	Low	Least Concern	None	Schedule-II
Ashy Prinia <i>Prinia socialis</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Plain Prinia <i>Prinia inornata</i>	Low	Least Concern	None	Schedule-II
Blyth's Reed Warbler <i>Acrocephalus dumetorum</i>	Low	Least Concern	None	Schedule-II
Clamorous Reed Warbler <i>Acrocephalus stentoreus</i>	Low	Least Concern	None	Schedule-II
Barn Swallow <i>Hirundo rustica</i>	Moderate	Least Concern	None	Schedule-II
Wire-tailed Swallow <i>Hirundo smithii</i>	Low	Least Concern	None	Schedule-II
Red-vented Bulbul <i>Pycnonotus cafer</i>	Low	Least Concern	None	Schedule-II
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	Low	Least Concern	None	Schedule-II
White-browed Bulbul <i>Pycnonotus luteolus</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Yellow-browed Bulbul <i>Acritillas indica</i>	Moderate	Least Concern	Western Ghats & Sri Lanka	Schedule-II
Green Warbler <i>Phylloscopus nitidus</i>	NA	Least Concern	None	Schedule-II



# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

## COMPLETE LIST OF SPECIES

Species	SoIB Priority	IUCN	Endemic Region	WLPA
Greenish Warbler <i>Phylloscopus trochiloides</i>	Low	Least Concern	None	Schedule-II
Puff-throated Babbler <i>Pellorneum ruficeps</i>	Low	Least Concern	None	Schedule-II
Rufous Babbler <i>Argya subrufa</i>	Moderate	Least Concern	Western Ghats	Schedule-II
Jungle Babbler <i>Argya striata</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Yellow-billed Babbler <i>Argya affinis</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Chestnut-tailed Starling <i>Sturnia malabarica</i>	Low	Least Concern	None	Schedule-II
Malabar Starling <i>Sturnia blythii</i>	Low	Not Recognised	Western Ghats	Schedule-II
Common Myna <i>Acridotheres tristis</i>	Low	Least Concern	None	Schedule-II
Orange-headed Thrush <i>Geokichla citrina</i>	Moderate	Least Concern	None	Schedule-II
Asian Brown Flycatcher <i>Muscicapa dauurica</i>	Low	Least Concern	None	Schedule-II
Brown-breasted Flycatcher <i>Muscicapa muttui</i>	Low	Least Concern	None	Schedule-II
Indian Robin <i>Copsychus fulicatus</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Oriental Magpie Robin <i>Copsychus saularis</i>	Low	Least Concern	None	Schedule-II
Tickell's Blue Flycatcher <i>Cyornis tickelliae</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Pale-billed Flowerpecker <i>Dicaeum erythrorhynchos</i>	Low	Least Concern	Indian Subcontinent	Schedule-II

# BIRDS OF PAYYANUR COLLEGE

State: Kerala

District: Kannur

COMPLETE LIST OF SPECIES				
Species	SoIB Priority	IUCN	Endemic Region	WLPA
Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Purple Sunbird <i>Cinnyris asiaticus</i>	Low	Least Concern	None	Schedule-II
Loten's Sunbird <i>Cinnyris lotenius</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Jerdon's Leafbird <i>Chloropsis jerdoni</i>	Low	Least Concern	Indian Subcontinent	Schedule-II
Golden-fronted Leafbird <i>Chloropsis aurifrons</i>	Low	Least Concern	None	Schedule-II
Scaly-breasted Munia <i>Lonchura punctulata</i>	Low	Least Concern	None	Schedule-II
White-rumped Munia <i>Lonchura striata</i>	Low	Least Concern	None	Schedule-II
Western Yellow Wagtail <i>Motacilla flava</i>	Moderate	Least Concern	None	Schedule-II
White-browed Wagtail <i>Motacilla maderaspatensis</i>	Low	Least Concern	Indian Subcontinent	Schedule-II

DATA CONTRIBUTIONS	
Number of Observations	3759
Number of Lists	230
Number of Unique Lists	154
Number of Hours	108
Number of Observers	23