



THE COCHIN COLLEGE

Koovapadam, Kochi-2

Affiliated To Mahatma Gandhi University

Re-accredited by NAAC With B+ Grade



Fourth Cycle
NAAC Accreditation 2024

Criterion 7 Institutional Values and Best Practices

DVV Clarifications

7.1. Institutional Values and Social Responsibilities

Metric No. 7.1.3.

7.1.3. Quality audits on environment and energy regularly undertaken by the Institution. The institutional environment and energy initiatives are confirmed through the following

7.1.3. Achievement Report of Clean and Green Campus Initiatives and Certificate from the external accredited auditing agency

Submitted to



National Assessment and Accreditation Council



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KOCHI - 682 002

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Achievement Report of Clean and Green Campus Initiatives undertaken by the College

1 Green Impact of Solar Power Generation

The Cochin College has an On-Grid Solar PV Power Plant with a capacity of 40 kW, capable of generating 160 kWh of electricity per day. The potential savings and environmental impact of this is assessed as follows.

1.1 Total Energy Generation by Solar

The Cochin College has an On-Grid Solar PV Power Plant with a capacity of 40 kW, capable of generating 160 kWh of electricity per day. The total energy generated per month would be:

$$160 \text{ kWh/day} \times 30 \text{ days} = 4800 \text{ kWh/month}$$

This means that the solar power plant generates 4800 kWh of electricity per month.

1.2 Monthly Energy Consumption from Bills

From the electricity bills:

- **Monthly Electricity Consumption (January):** 2070 kWh (KSEB January bill)

Thus, the solar panels generate more electricity (4800 kWh) than the college consumes monthly, providing the potential to offset the entire electricity bill.

1.3 Cost Savings

1.3.1 Monthly Cost Savings

With the current solar power plant generating more electricity than needed, the college could offset its entire electricity bill.

For the monthly bill:





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- Energy Charge for January: 19,890 (2070 kWh)

The total monthly savings would be:

$$\text{Total Monthly Savings} = \text{Energy Charge} = 19,890 \text{ (January)}$$

1.3.2 Annual Cost Savings

If the solar power plant covers the entire electricity demand each month, the annual savings would be:

$$\text{Annual Savings (January)} = 19,890 \times 12 = 2,38,680$$

1.4 Green Impact (Carbon Footprint Reduction)

Using the emission factor of 0.92 kg CO_2 /kWh, the carbon emissions avoided by generating 4800 kWh per month through solar energy are:

1.4.1 Carbon Reduction per Month

$$\text{Carbon Reduction per Month} = 4800 \text{ kWh} \times 0.92 \frac{\text{kg } CO_2}{\text{kWh}} = 4416 \text{ kg } CO_2/\text{month}$$

1.4.2 Carbon Reduction per Year

$$\text{Carbon Reduction per Year} = 4416 \text{ kg } CO_2/\text{month} \times 12 = 52,992 \text{ kg } CO_2/\text{year}$$





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Solar OnGrid Consumer (Generator)

Consumer No.	1155623000729	Consumer Name	THE COCHIN EDUCATION SOCIETY
SPIN	556200173	Plant Capacity	40 KW
Grid Connected On	17-05-2022		

Bank Statement for 202401 (Generator)

Units Imported	900 kWh	Units Exported	3060 kWh
Bank Opening	1805.4	Billed Consumption	0 kWh
Bank Closing	2378.77		

Solar Group Consumers (Beneficiaries)

Priority	Consumer #	Section
1	1155623000729	5562
2	1155629013043	5562
3	1155628028625	5562

Generated on 23.08.24 11:58 am

Registered Office: Vyudyuthi Bhavanam, Pattom, Thiruvananthapuram 695 004, Website: www.kseb.in



Mrudula Menon V.
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Principal-in-Charge
The Cochin College



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Consumption Adjustment Report

Bill Month	Consumer #	Zone Code	Import	Export	Export + Bank	Solar Energy (Bank Energy X Factor)	Adjusted from bank	Billed Cons.	Banked Balance
202312	00729	A	1080	1650	4641.27	4641.27	1080	0	3561.27
	13043	A	1660	0	3561.27	3366.82	1660	0	1706.82
202401	00729	A	900	3060	4865.4	4865.4	900	0	3965.4
	13043	A	1500	0	3965.4	3748.89	1500	0	2248.89

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FACTOR : 0-Reading Not Accepted/Door Lock -Applying Wheeling Charges 1/-Resetting Wheeling Charges



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KERALA STATE ELECTRICITY BOARD LIMITED							
DEMAND CUM DISCONNECTION NOTICE							
(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)							
Section	5562]-Electrical Section Thoppumpady		Phone#	0484-2231414		Customer Care	1912
Consumer#	1155629013043		Reg. Mob#	940xxxx473		Regular CC Bill	KSEBL GSTIN: 32AAECK2277NBZ1
Name & Mailing Address			For redressing complaints/grievance approach the concerned CGRF				
JOSE T MOOKKEN PRESIDENT COCHIN EDUCATIONAL SOCIETY, COCHIN COLLEGE BUILDING COCHIN 2, THOPPUMPADY			South: Chairperson, CGRF(South), KSEBL, Vidyuthi Bhavanam, Kottarakkara-691506, Ph:0474-2451300 Central: Chairperson, CGRF(Central), KSEBL, 220KV SubStation, Kalamassery-683503, Ph:0484-2556500 North: Chairperson, CGRF(North), KSEBL, Vidyuthi Bhavanam, Gandhi Rd., Kozhikode-673011, Ph:0495-2367820 State Electricity Ombudsman, D.H.Rd & Foreshore Rd Jn., Near Gandhi Square, Ernakulam-682016, Ph:0484-2346488				
Bill#	5562240103857		Bill Area	M01/1	DTR	COCHIN COLLEGE	
Billing Period	1/2024(Monthly)		Tariff/Phase	LT-6F/Three	Pole#	PP-30	
Bill Date	03-01-2024		Due Date	13-01-2024	DC Date	29-01-2024	
Contract Demand	(Nil) VA [75% : 0KV, 130% : 0KV]		Connected Load	49725 Watts	Security Deposit	Rs.50630.00	
Meter#	GPIAPR180004339810		Average consumption(Monthly)				
Meter Digits	6.2		Power Unit/Zone	CUMULATIVE			
Meter Type/Owner	TOD/KSEB		KWH	500			
Last Billed Rdg. Date	Prev. Rdg. Date	Prev. Meter Rdg. Status		Prst. Rdg. Date	Prst. Meter Rdg. Status		
01-12-2023	01-12-2023	Working		03-01-2024	Working		
Power Unit	Zone	Trading	Initial Reading(IR)	Final Reading(FR)	OMF	Units*	
KWH	Cumulative	Import	1265.00	1340.00	20	1500	
Remarks :			Bill Details				
Last Paid Amount - Rs.21942.00			a) Fixed Charges				
Last Payment Date - 22-08-2024			Fixed Charge(FC)				
Payable amt.(excluding ACD) as on 2024-01-17 15:30:38:Rs.9047/-			Sub Total				
			9000.00				
			Sub Total				
			0.00				
			c) Other Charges				
			Meter Rent(MR)				
			Sub Total				
			30.00				
			d) GST				
			MR-CGST				
			2.70				
			MR-SGST				
			2.70				
			Sub Total				
			5.40				
			e) Round Off				
			-0.40				
			e) Total Amt.(Bill#5562240103857) (a+c+d+e)				
			9035.00				
			f) Surcharge				
			12.00				
			g) Reconnection Fee				
			0.00				
			h) Interim Bills				
			0.00				
			i) Arrears				
			0.00				
			j) Less paid/adj.				
			-9047.00				
			k) Less Advance				
			-0.00				
			Net Payable(e+f+g+h+i-j-k)				
			0.00				
Demand for 1/2024 is Rupees Nine Thousand and Thirty Five Only							

E&OE Payment Options: Cash, Cheque, DD, MO. Online: www.kseb.in (Debit/Credit Cards, Net Banking). Other Platforms: BBPS, Friends, Akshaya, CSC, NACH

CochinNET Ver#2.4.3 dtl 20/07/2024 printed @ 23/08/2024 12:08:34

Senior Superintendent



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2 Green Impact of The Cochin College's ReforM Project

The Cochin College, through its **ReforM project** of recycling paper, has recycled approximately **1436 kg of paper** every year, thereby creating a significant green impact. Below is a detailed breakdown of the environmental benefits of recycling this amount of paper.

2.1 Trees Saved

$$\text{Trees Saved} = 1436 \text{ kg} \times \frac{17 \text{ trees}}{1000 \text{ kg}} = 24.41 \text{ trees}$$

2.2 Water Conservation

$$\text{Water Saved} = 1436 \text{ kg} \times \frac{26,500 \text{ liters}}{1000 \text{ kg}} = 38,054 \text{ liters}$$

2.3 Energy Savings

$$\text{Energy Saved} = 1436 \text{ kg} \times \frac{4000 \text{ kWh}}{1000 \text{ kg}} = 5744 \text{ kWh}$$

2.4 Landfill Space Saved

$$\text{Landfill Space Saved} = 1436 \text{ kg} \times \frac{3 \text{ m}^3}{1000 \text{ kg}} = 4.31 \text{ m}^3$$

2.5 Reduction in CO Emissions

$$\text{CO}_2 \text{ Reduction} = 1436 \text{ kg} \times \frac{1 \text{ ton CO}_2}{1000 \text{ kg}} = 1.44 \text{ tons CO}_2$$

2.6 Environmental Benefits of the ReforM Project

- 24 trees saved.
- 38,054 liters of water conserved.
- 5744 kWh of energy saved.
- 4.31 cubic meters of landfill space saved.
- 1.44 metric tons of CO emissions reduced.





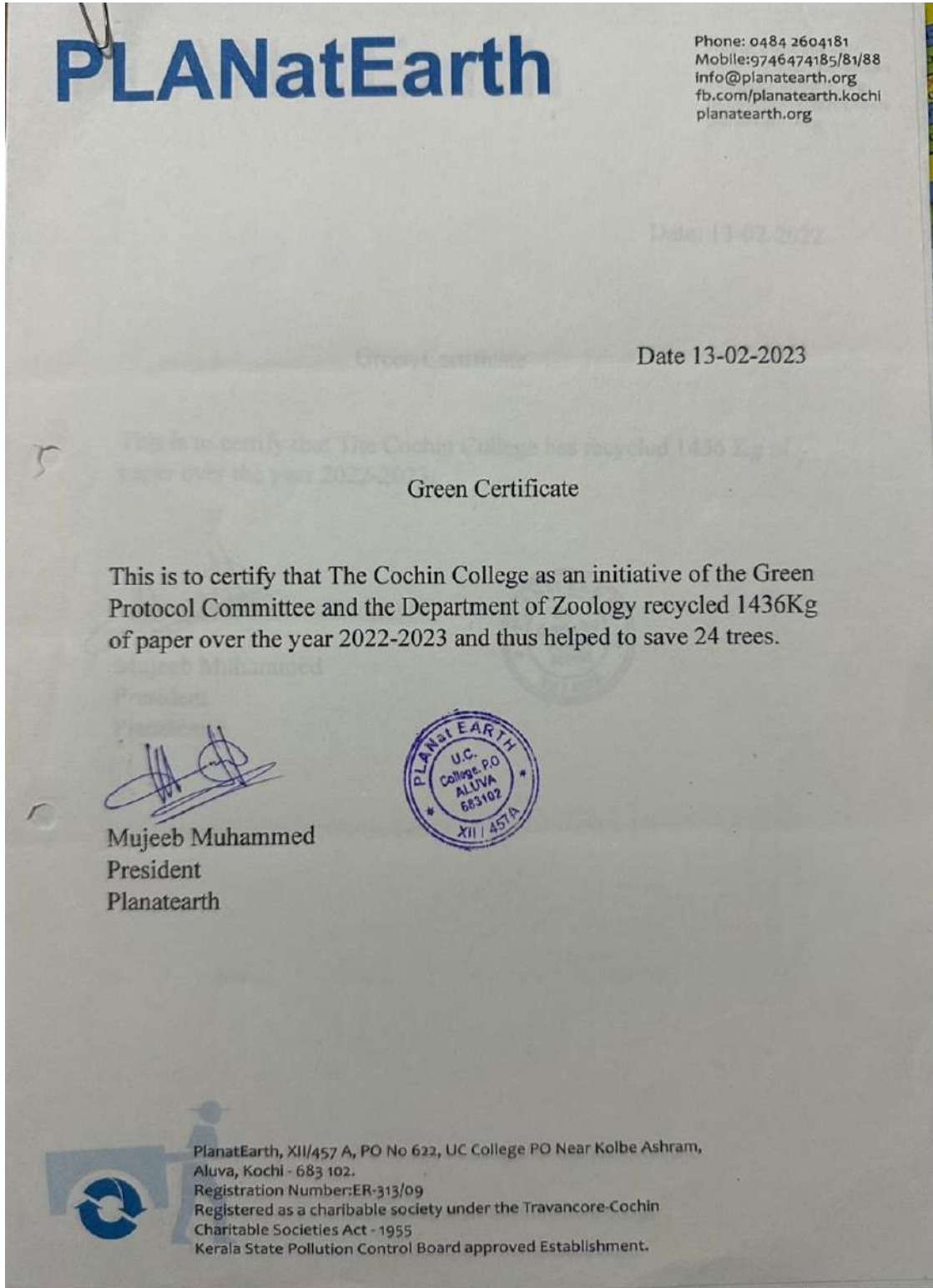
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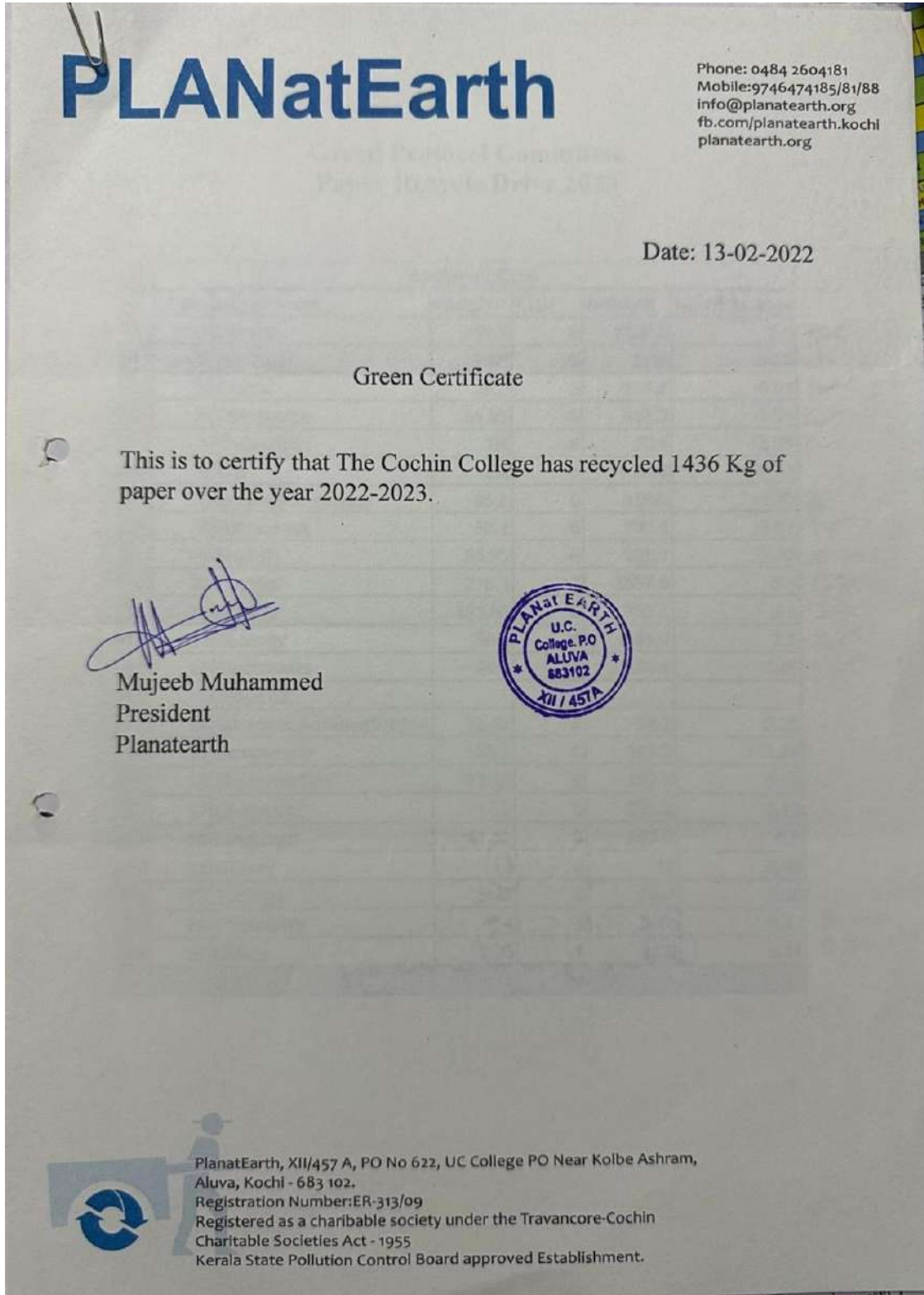
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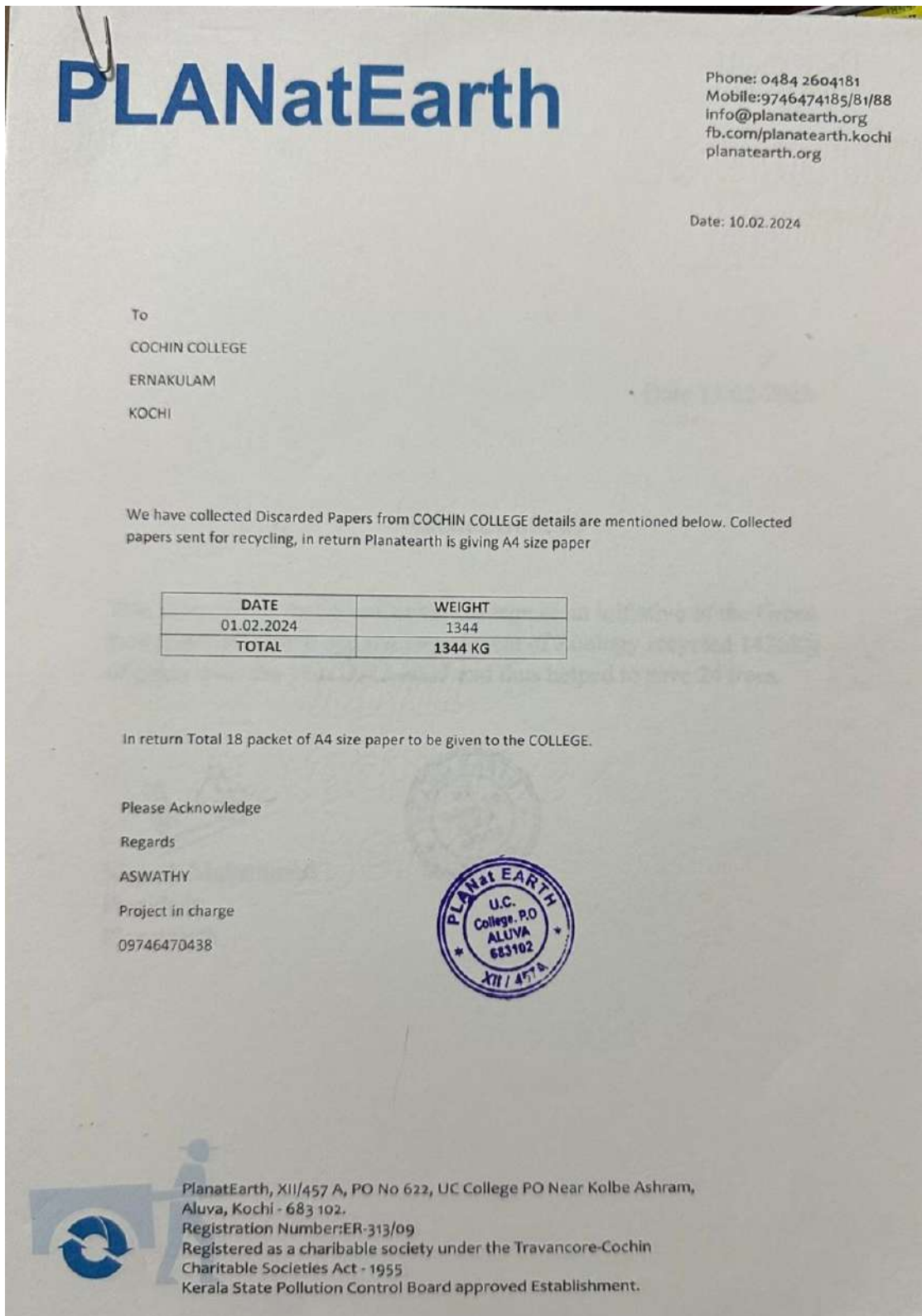
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3 Green Impact of e SSR Preparation

The Cochin College, through its Internal Quality Assurance Cell (IQAC), has adopted an electronic mode for data collection, compilation, and analysis in the preparation of the Self-Study Report (SSR). This paperless approach aligns with the institution's commitment to sustainability and significantly reduces its carbon footprint, contributing to environmental conservation.

3.1 Electronic Data Collection and Compilation Process

The process begins with data collection from multiple sources, including faculty, departments, office, management, and students. Using Google Forms, data is collected digitally, followed by electronic compilation and analysis through various digital tools. No paper is printed at any stage, resulting in significant reductions in resource use and carbon emissions.

3.2 Estimating the Environmental Impact of Paperless SSR Preparation

To quantify the environmental benefits, we can calculate the carbon footprint avoided by eliminating the need for printing 26,373 A4 sheets, which would have been used in a traditional paper-based approach.

3.2.1 Carbon Footprint from Paper

Each A4 sheet of paper typically emits 5 grams of CO_2 during production. The carbon footprint saved by not printing 26,373 sheets can be calculated as:

$$\text{Carbon Footprint (Paper)} = 26,373 \text{ A4 sheets} \times 5 \text{ g } CO_2/\text{sheet} = 131,865 \text{ g } CO_2 \text{ or } 131.87 \text{ kg } CO_2$$

3.2.2 Carbon Footprint from Ink/Toner Production

In addition to paper, printing also involves ink/toner production. The estimated emission is 0.5 grams of CO_2 per sheet for ink/toner. Thus, the carbon footprint saved from ink/toner usage is:

$$\text{Carbon Footprint (Ink/Toner)} = 26,373 \text{ A4 sheets} \times 0.5 \text{ g } CO_2/\text{sheet} = 13,186.5 \text{ g } CO_2 \text{ or } 13.19 \text{ kg } CO_2$$

3.2.3 Carbon Footprint from Printer Energy Usage

Printers consume energy during printing. A typical laser printer consumes about 0.04 kWh per 100 pages, and using the global average of 450 g CO_2 /kWh, the energy consumption and carbon footprint are calculated as:





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$$\text{Energy Consumption} = \frac{26,373 \text{ A4 sheets}}{100} \times 0.04 \text{ kWh} = 10.55 \text{ kWh}$$

$$\text{Carbon Footprint (Printer Energy)} = 10.55 \text{ kWh} \times 450 \text{ g CO}_2/\text{kWh} = 4,747.5 \text{ g CO}_2 \text{ or } 4.75 \text{ kg CO}_2$$

3.2.4 Reduction in Carbon Footprint from Compressing the File

Initial Recurring Carbon Footprint (before compression):

Initial size: 5904.88 MB

Carbon footprint per MB per year: 0.0315 kWh multiplied by 450 g CO per kWh

$$\text{Initial Carbon Footprint} = 5904.88 \times 0.0315 \times 450 \div 1000 = 83.61 \text{ kg CO}_2 \text{ per year}$$

Final Recurring Carbon Footprint (after compression):

Final size: 809.42 MB

$$\text{Final Carbon Footprint} = 809.42 \times 0.0315 \times 450 \div 1000 = 11.45 \text{ kg CO}_2 \text{ per year}$$

Reduction in Carbon Footprint:

$$\text{Reduction} = 83.61 - 11.45 = 72.16 \text{ kg CO}_2 \text{ per year}$$





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Percentage Reduction:

$$\text{Percentage Reduction} = \left(\frac{72.16}{83.61} \right) \times 100 = 86.32\%$$

3.2.5 Reduction in Cloud Storage Space and Electricity Savings

Step 1: Reduction in Cloud Storage Space

Initial Size = 5904.88 MB

Final Size = 809.42 MB

Reduction in Cloud Storage Space = 5904.88 MB – 809.42 MB = 5095.46 MB

Step 2: Savings on Electricity

Energy consumption per MB per year is approximately 0.0315 kWh. Therefore, the electricity savings are calculated as:

$$\text{Energy Savings} = 5095.46 \text{ MB} \times 0.0315 \text{ kWh/MB} = 160.51 \text{ kWh/year}$$

Step 3: Carbon Footprint Savings

Assuming each kWh generates 450 grams of CO₂, the carbon footprint savings are:

$$\text{Carbon Footprint Savings} = 160.51 \text{ kWh/year} \times 450 \text{ g CO}_2/\text{kWh} = 72.23 \text{ kg CO}_2/\text{year}$$

Summary of Results:

- Reduction in Cloud Storage Space: 5095.46 MB
- Electricity Savings: 160.51 kWh per year
- Carbon Footprint Savings: 72.23 kg CO per year





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3.3 Total Carbon Footprint Saved

The total carbon footprint saved by adopting a paperless approach can be calculated by summing the individual components:

Total Carbon Footprint = 131.87 kg CO₂ (Paper)+13.19 kg CO₂ (Ink/Toner)+4.75 kg CO₂ (Printer Energy) = 149.81 kg CO₂

Thus, the institution saved approximately 149.81 kg of CO₂ emissions by eliminating the need for printing 26,373 A4 sheets during the SSR preparation process.

4 Conclusion

The sustainable initiatives undertaken by The Cochin College, from transitioning to a paperless SSR preparation process to leveraging solar power and recycling through the ReforM project, have yielded significant environmental benefits. By adopting digital solutions, the institution has effectively reduced its carbon footprint, saving over 149.81 kg of CO emissions through paperless practices alone. The integration of solar energy has led to substantial financial savings and the avoidance of 52,992 kg of CO emissions annually, further demonstrating the college's commitment to environmental responsibility. Additionally, the ReforM project has conserved vital natural resources, saving trees, water, and energy, and reducing landfill waste. These initiatives not only highlight The Cochin College's dedication to sustainable practices but also set a valuable example for other institutions aiming to balance educational excellence with environmental stewardship. The college's efforts underscore the importance of integrating sustainability into everyday operations, contributing to a greener future for both the institution and the planet.

