



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

7.1 - Institutional Values and Social Responsibilities

Metric No. 7.1.2

The Institution has facilities and initiatives for *Alternate sources of energy and energy conservation measures, Management of the various types of degradable and nondegradable waste, Water conservation, Green campus initiatives, Disabled-friendly, barrier free environment*

Impact of Key Green initiatives

Submitted to



National Assessment and Accreditation Council



THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

Declaration on Principal

This is to declare that the the green initiatives at the college has created following impacts

Mrudula Menon V.





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochoincollege.edu.in

email: email@thecochoincollege.edu.in

Contents

1 Green Impact of e SSR Preparation	3
1.1 Electronic Data Collection and Compilation Process	3
1.2 Estimating the Environmental Impact of Paperless SSR Preparation	3
1.2.1 Carbon Footprint from Paper	3
1.2.2 Carbon Footprint from Ink/Toner Production	4
1.2.3 Carbon Footprint from Printer Energy Usage	4
1.2.4 Reduction in Carbon Footprint from Compressing the File	4
1.2.5 Reduction in Cloud Storage Space and Electricity Savings	5
1.3 Total Carbon Footprint Saved	6
2 Green Impact of Solar Power Generation	6
2.1 Total Energy Generation by Solar	6
2.2 Monthly Energy Consumption from Bills	6
2.3 Cost Savings	7
2.3.1 Monthly Cost Savings	7
2.3.2 Annual Cost Savings	7
2.4 Green Impact (Carbon Footprint Reduction)	7
2.4.1 Carbon Reduction per Month	7
2.4.2 Carbon Reduction per Year	7
3 Green Impact of The Cochin College's ReforM Project	7
3.1 Trees Saved	8
3.2 Water Conservation	8
3.3 Energy Savings	8
3.4 Landfill Space Saved	8
3.5 Reduction in CO Emissions	8
3.6 Environmental Benefits of the ReforM Project	8
4 Conclusion	8





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

Measuring the Green Impact: Quantifying the Benefits of Sustainable Initiatives at The Cochin College

1 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.

1.1 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.

1.2 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.

1.2.1 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:

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





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

1.2.2 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:

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

1.2.3 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:

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

$$\text{Carbon Footprint (Printer Energy)} = 10.55 \text{ kWh} \times 450 \text{ g } CO_2/\text{kWh} = 4,747.5 \text{ g } CO_2 \text{ or } 4.75 \text{ kg } CO_2$$

1.2.4 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_2 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:

$$\text{Reduction} = 83.61 - 11.45 = 72.16 \text{ kg } CO_2 \text{ per year}$$





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

Percentage Reduction:

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

1.2.5 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





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

1.3 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.

2 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.

2.1 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.

2.2 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.





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

2.3 Cost Savings

2.3.1 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:

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

The total monthly savings would be:

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

2.3.2 Annual Cost Savings

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

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

2.4 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:

2.4.1 Carbon Reduction per Month

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

2.4.2 Carbon Reduction per Year

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

3 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.





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

3.1 Trees Saved

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

3.2 Water Conservation

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

3.3 Energy Savings

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

3.4 Landfill Space Saved

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

3.5 Reduction in CO Emissions

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

3.6 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.

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





THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

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.

