

7.1.2.1 Alternate sources of energy and energy conservation measures

- The sustainable practices of the institution places emphasis on the "generation of renewable sources of energy.
- Solar panels with a net capacity of 33 KW are installed on the campus to minimise the use of non-renewable energy.

Institutional initiatives for energy conservation,

1. Installation of solar panels in college and hostel
 2. On grid systems in college and hostel
 3. Off grid system in college and hostel
 4. Installation of LED lights
 5. Motion sensor lights
 6. Motion sensor camera
 7. Providing energy-saving reminders in all areas
 8. Construction of a sufficient number of windows and ventilation for natural light and air passage
 9. Construction of biogas plants
 10. Equipment with energy efficiency (4-5 star AC, refrigerator etc)
 11. Laboratory instruments with thermostat
 12. Regular monitoring laboratory equipment and immediate rectification of any problems
- **LED lights** are installed in the campus to **minimize the power consumption**.
 - **Motion sensor** lights, which **trigger** a response only when motion is detected, are installed in the refreshment area.
 - A **motion sensor camera** that uses motion activation to turn on rather than recording 24 hours is installed in the animal house.
 - **Adequate windows and doors** in all rooms and labs allow natural light to enter, minimising the usage of bulbs and tubes during the daytime.
 - Reminder boards bearing the message "**switch off lights and fans**" are provided in all areas.
 - **Biogas** is the main source of cooking energy in the Ladies Hostel, minimising the use of LPG.



1. Solar panels



Solar panels in college



Solar panels in college



Solar panels in hostel

2. On grid system in college and hostel

Solar OnGrid Consumer (Generator)

Consumer No.	1155910018649	Consumer Name	ADMINISTRATOR NIRMALA COLLEGE PHARMACY
SPIN	559100116	Plant Capacity	43 KW
Grid Connected On	02-05-2023		

Bank Statement for 202307 (Generator)

Units Imported	3978 kWh	Units Exported	303 kWh
Bank Opening	0	Billed Consumption	3675 kWh
Bank Closing	0		

On grid system in college -KSEB report



On grid system in college



Solar OnGrid Consumer (Generator)

Consumer No.	1155915028013	Consumer Name	FR CHERIAN
SPIN	559100154	Plant Capacity	9 KW
Grid Connected On	22-03-2023		

Bank Statement for 202309 (Generator)

Units Imported	3364 kWh	Units Exported	4 28 kWh
Bank Opening	0	Billed Consumption	2936 kWh
Bank Closing	0		

On grid system in hostel -KSEB report



On grid system in hostel

2. Off grid system in college and hostel



Off grid system in college

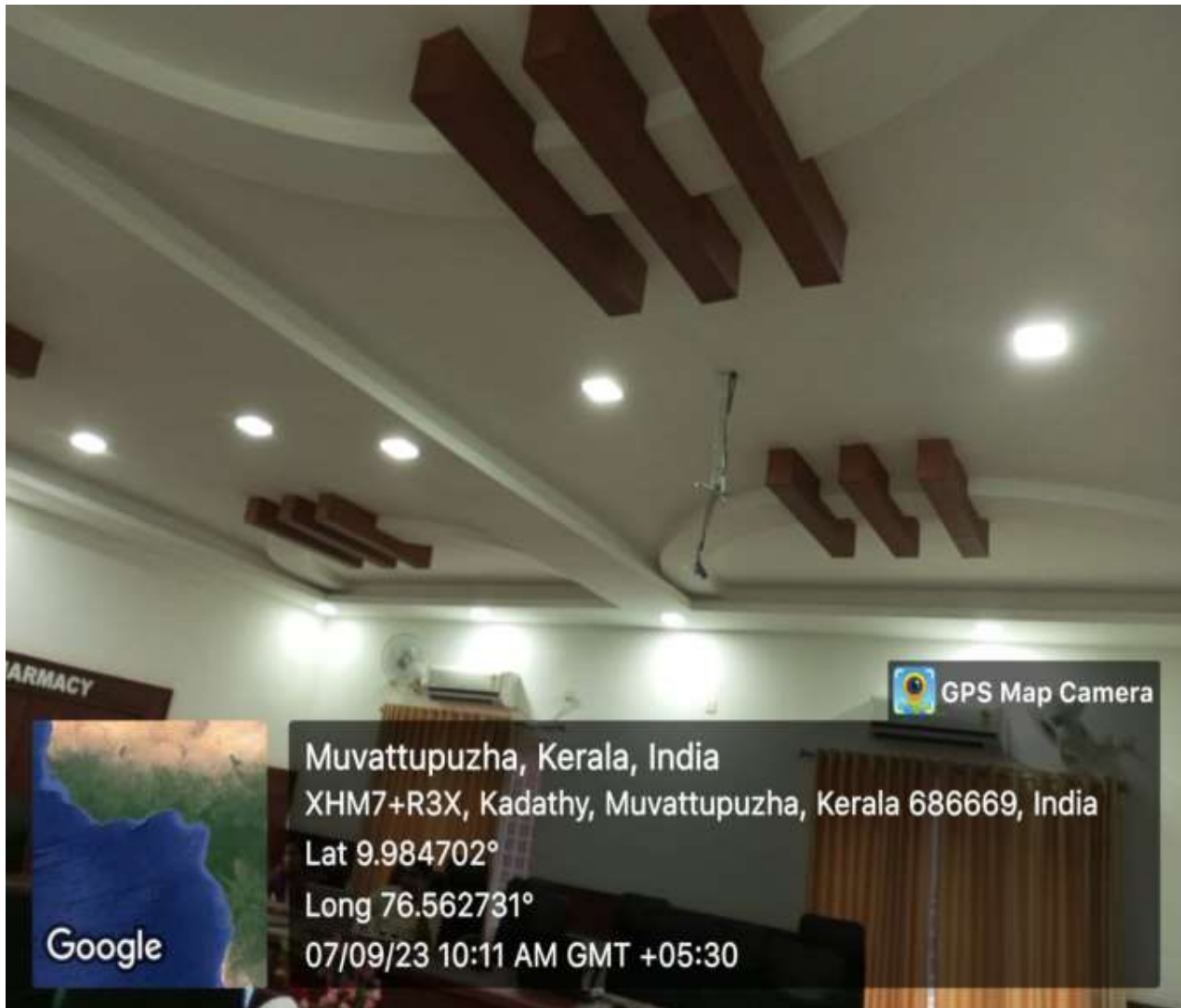


Off grid system in hostel

4. LED lights



LED Lights in digital library

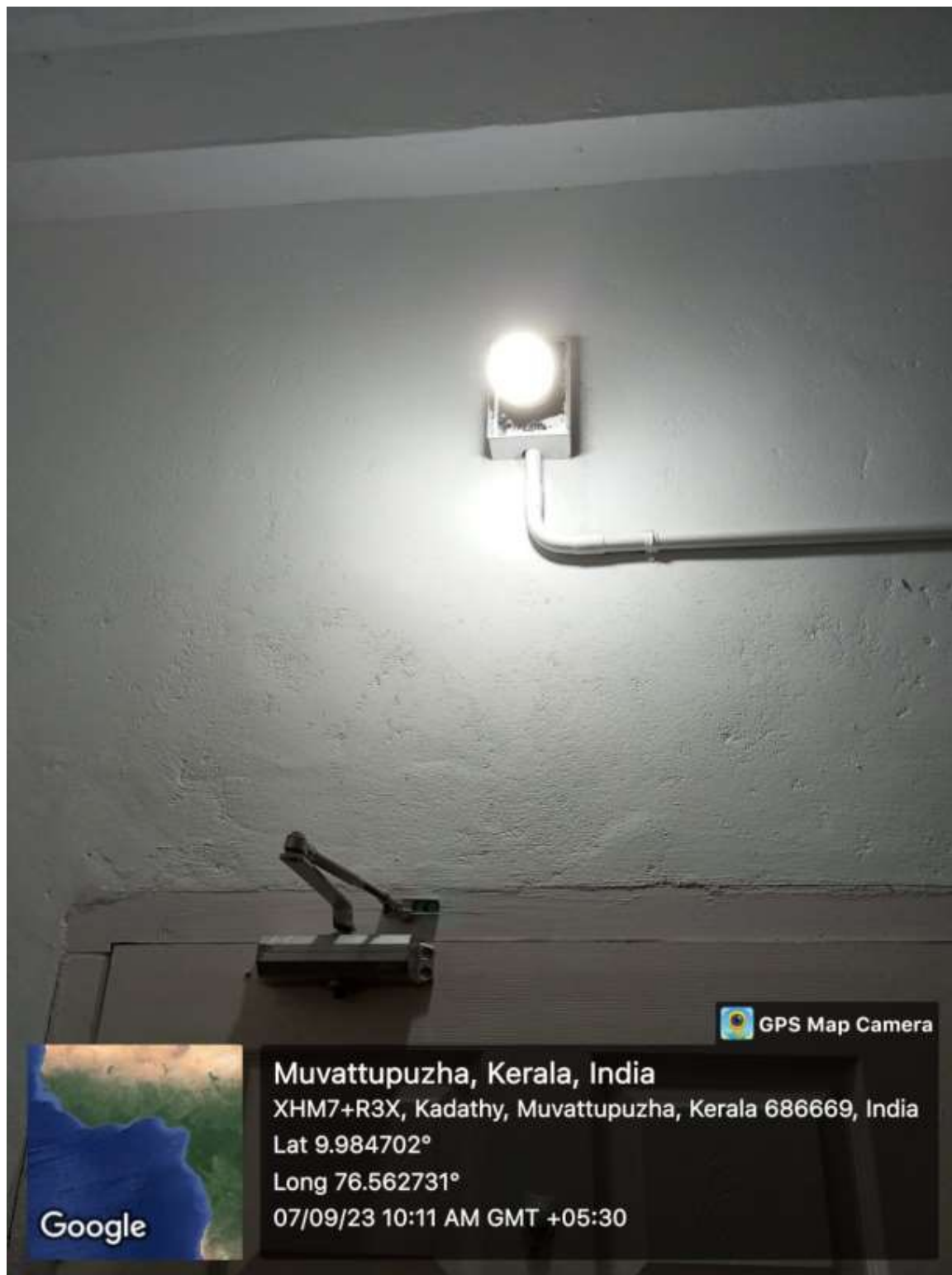


LED Lights in GD hall



LED lights in compound

5. Motion sensor light



Motion sensor light in refreshment area

6.Motion sensor Camera



Motion sensor camera in animal house

7. Energy saving reminder



Energy saving reminder in class room

8. Well-ventilated rooms



Class room

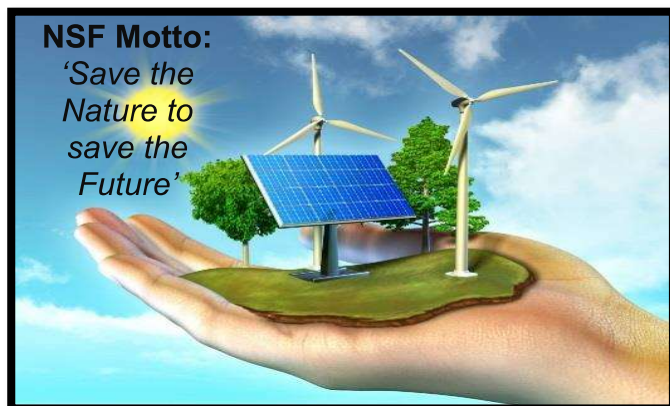


Labs

Report of Light Intensity Measurement at the Campus



TECHNICAL REPORT OF ENERGY AUDIT



Submitted to

**NIRMALA COLLEGE OF PHARMACY MUVATTUPUZHA
ERNAKULAM DT, KERALA-686 661, INDIA**

Date of Audit: 26.07.2023

Valid till: 27.07.2025

Submitted by



NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement)
**ISO QMS (9001:2015), EMS (14001:2015), OHSMS (45001:2018) & EnMS
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Table 10. Standards for Comparison

S.No	Building Type	Space Type	Illuminances (LUX)
1.	Barracks / Dormitories	Bed Rooms	300
		Laundry Rooms	
2.	Educational Buildings	Play Room, Nursery, Classroom, Lecture Hall	400
		Computer Practice Rooms	300
3.	Office Buildings	Single Offices, Open plan Offices	400
		Conference Rooms	300
4.	Hospitals	General ward Lighting	300
		Simple Examination	500
		Examination and Treatment Ward	1000
5.	Hotels and Restaurants	Kitchen	500
		Buffet	100
6.	Sports Facilities	Sports halls	300
7.	Circulation areas	Corridors and Stairs	500
		Cloak Rooms, Wash Rooms, Bath Rooms, Toilets	300
8.	Industrial areas	Metal working / Welding	300
		Simple Assembly	300
		Difficult Assembly	1000
		Exacting Assembly	3000-10000

Reference set of values for LUX

Source: lumitronlighting.com www.lumitronlighting.com/lighting_nowledge/LUX

Table 11. Light intensity measured at various locations in the Institute

S.No	Type of Spaces	Illuminances (LUX)
1.	Class room	385 ± 4
2.	Auditorium	408.33 ± 2.0
3.	Seminar hall	436 ± 3
4.	Library	465 ± 2.6
5.	Laboratory	444 ± 3.6
6.	Canteen	505.67 ± 3.5
7.	Open area	506.33 ± 0.5



8.	Parking area	494.33 \pm 2.0
	Mean	455.58
	SE	2.61
	CD	4.65

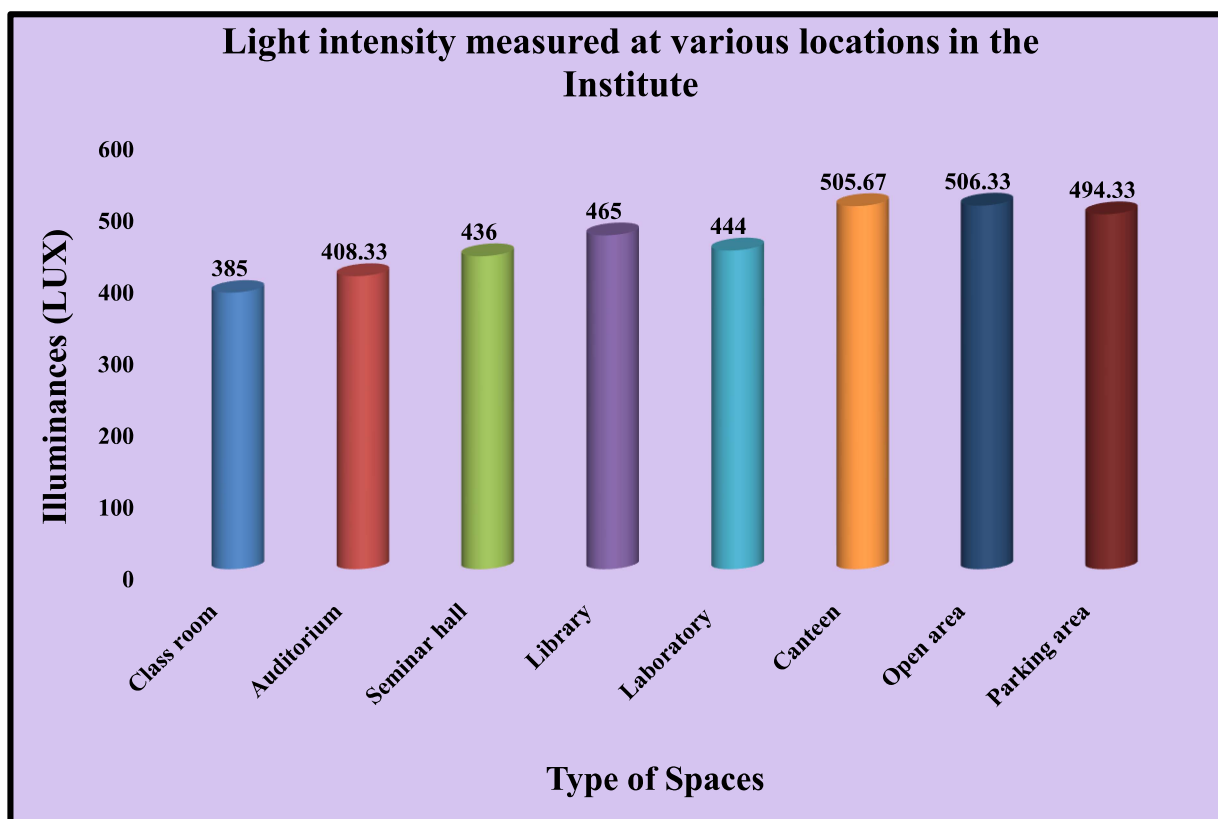


Figure 4. Light intensity measured at various locations in the Institute

9. Biogas plant



Biogas plant in hostel

10. Equipment with energy efficiency



Energy stored refrigerator

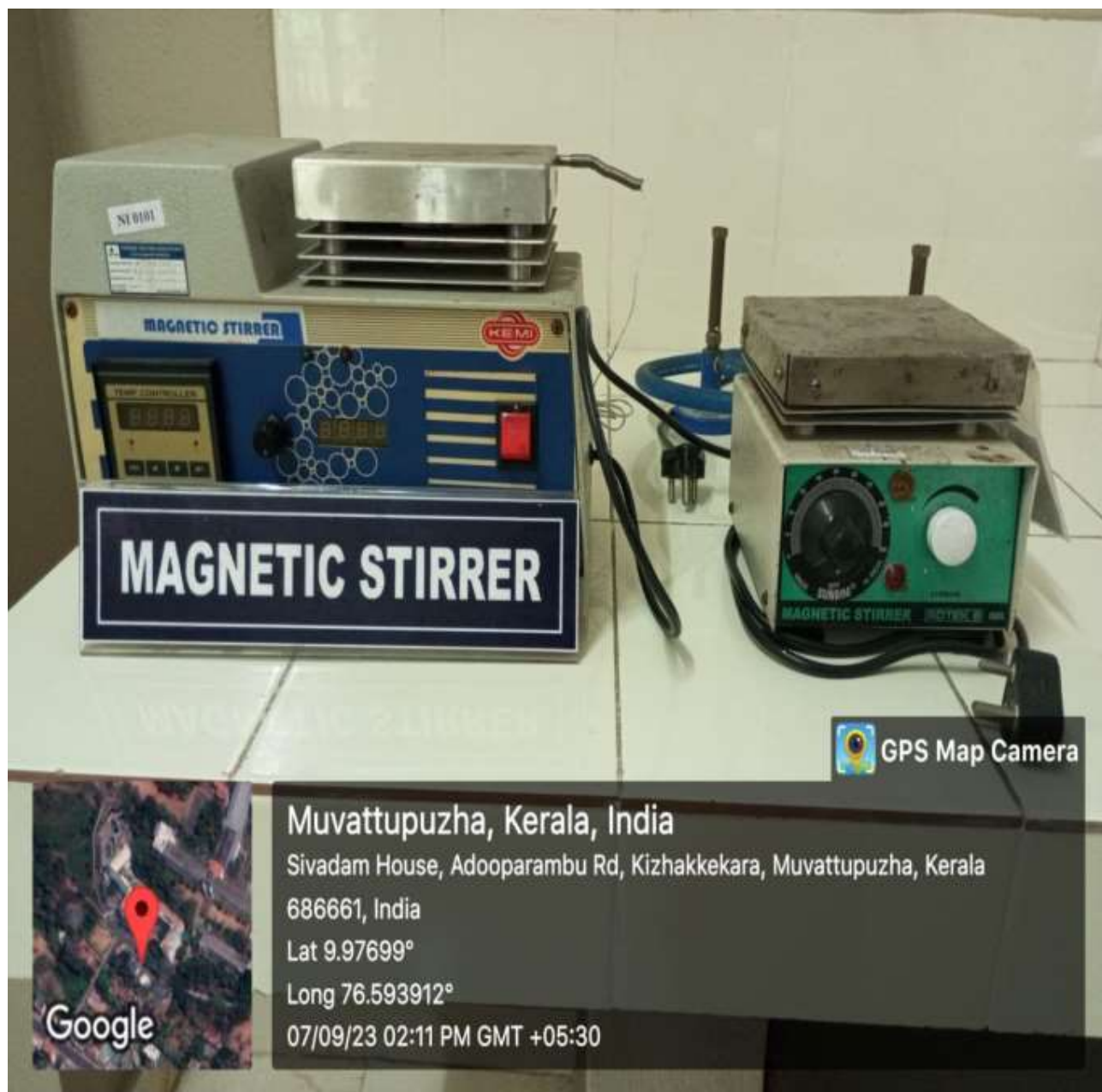


Energy star rated air conditioner

11.Laboratory instruments with thermostat



Water bath with thermostat



Magnetic stirrer



Incubator



Hot air oven