



SIDDHINATH MAHAVIDYALAYA

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Estd. - 2013

SHYAMSUNDARPUR PATNA • PANSKURA • PURBA MEDINIPUR • PIN - 721139 • Phone - 03228-255030
email - siddhinathmahavidyalaya@gmail.com

Green Audit Report

of

Siddhinath Mahavidyalaya

Vill+ P. O.- Shyamsundarpur Patna, P.S.- Panskura, Dist.-
PurbaMedinipur, Pin-721139, State - West Bengal, India

30 April 2023

by

Dr. Barun Shankar

GuptaEHS Auditor

(ISO 14001:2015 & ISO 45001:2018)



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Introduction

Siddhinath Mahavidyalay, S. S. Patna, Purba Medinipur, West Bengal, is affiliated to Vidyasagar University of West Bengal. The college conducted “Environment and Green Audit” in the academic year 2022-2023. The primary objective of the audit was to check the environmentally benign practices followed by Siddhinath Mahavidyalaya, and to document statements of environment practices followed by the institute for environmentally sustainable development.

Scope

The audit covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- Green campus initiative and Environmental Monitoring

Methodology

The following methodology was followed

Onsite Visit

Field visit was conducted to verify and approximate the status of the green cover, infrastructure, administrative practices and waste management strategies.

Focus Group Discussion

The discussion was held with the in-charge members of the college on various aspects of Green Audit to approximate the resources and awareness towards environmental issues at the institutional level.



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Observations

S.No.	Area	Facilities	Total units	Capacity	Units
1	Built Environment	Built area	937	n.a.	sqm
2	Energy consumption (Electricity)	WBSEDCL Supply	n.a.	3	kVA
		Lights (fluorescent)	19	0.76	kW
		Lights (LED)	68	1.36	kW
		Fan	85	4.75	kW
		Gensets	nil	-	kVA
		Solar panels	4	2	kWp
		AC	2	2.5, 1.5	tonne
		Water pump	3	3	kW
		Other Motor	1	1	Hp
3	Water consumption	Point Source, groundwater	Water pump	n.a.	l/hr
		Water reservoir	5	n.a.	Kl
4	Water Treatment	R/O	3	n.a.	l/hr
5	Wastewater Treatment	STP	nil	-	MLD
6	Biogas	Pucca / kaccha	nil	-	kg
7	Bio composting / vermi composting	Units	3	n.a.	kg
8	E-waste	Stocking point	1	10	Kg
8	Green Campus	Trees	42	n.a.	No's
		Garden area / landscaping and beautification	n.a.	430	sqm
		Pond	1	N.a.	sqm
		e-waste management	1	n.a.	No's

*n.a. – Not applicable



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1. Water Management

Conservation and optimum use of water for the use and development within campus for drinking, gardening etc purposes is one of the primary focus of the institute. There are two primary sources of water, namely-

- i. Water pond – fed by surface water and groundwater. The ponds are located to act as rainwater reservoir as well as to support important activities like farming and gardening within campus. The pond bank and the pond water support local aquatic ecosystem.



Figure 1: Water pond and related ecosystem, Siddhinath Mahavidyalaya

- ii. Bore water - extracted by electrically operated pump to full the requirements. The extracted water is stored in overhead tank. This water is used for washroom, gardening and other activities. The water is fed into purifier for getting drinking quality water. The institute has 5kl capacity water reservoir.
- iii. Rain Water harvesting - The surface run off is collected in the ponds within the campus. Currently there is no rain water harvesting facility the deeply recharges the ground water.



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The type of wastewater is domestic waste water or the sewage water that mostly comes from several toilets / washbasins of the college and from the canteen. In addition, the RO water purifier produces waste water.

Recommendations – Water Management

- Point water sources for generation and disposal to be streamlined and regularly documented.
- The Reverse Osmosis (RO) system uses electricity during and produces RO waste during the day-long operation. Prefilter accessories and RO waste recycling may be done to ensure that the equipment is in good condition and is producing minimum waste
- Use of drip/sprinkler irrigation system to minimize water use in gardening and / or farming
- Rainwater harvesting system to be made for groundwater recharge.

1. Energy Management

Energy usage and consumption is crucial for the institute for conducting day-to-day activities. The energy sources, energy monitoring, lighting, appliances, natural gas and vehicular emissions contribute to the pattern of consumption. The primary source of energy is electrical energy College campus has 19 fluorescent and 68 LED bulbs. Electricity usage is saved by using LED bulbs. The campus contains ceiling / table fans in use. The entire campus including common rooms are equipped with LED lamps / LED tube lights. The desktop Computers are set to automatic power saving mode when not in use.

E-vehicle

The institute encourages the use of battery operated three-wheelers for shared travel to-and-fro home and institute. This reduces the consumption of energy at a larger scale.

Renewable energy

The institute harnesses energy in the form of Renewable solar energy (2 kWp). The solar energy is harvested for outdoor lighting and water pump operation.



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Figure 2: Solar panel based outdoor lighting, Siddhinath Mahavidyalaya



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Figure 3: Solar power based backup water pump, Siddhinath Mahavidyalaya



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Recommendations – Energy Management

- The college should create lanes / mark pedestrian and bike-track within campus, thereby motivating young students to use zero-energy bicycles.
- The college should plan for procuring renewable energy options on any energy-purchasing tender, thereby reducing the dependence on the State Electric Supply grid and move towards carbon neutral campus.
- Solar panel powered sensor based LED lights should be installed to reduce power consumed for lighting.
- The college campus administration should run power-switch-off mock drill on regular basis to generate energy conservation awareness among students.
- All electrical appliances to be kept in annual maintenance contract and cleaning to be done periodically, for maximum yield.

1. Waste Management Practices

Liquid Waste – The college campus generates domestic water waste that are now discarded in the drainage system.

Solid / municipal waste – College campus and surrounding locality generates solid municipal waste that are dumped as landfills. The campus is ‘Clean and Green’ by its own virtue due to proximity to rural area.

Horticultural waste – College campus has 430 sqm of lush greenery, garden and 42 number of trees. College campus has 01 pond. Horticultural waste is generated that is recycled / reused through the 03 composting facilities.

E – Waste: College campus has one (01 nos.) e-waste collection point for discarded Electronics.

Food Waste – The college campus has one canteen for students, faculty members and staff. The canteen generates food waste. The reasons for food waste may be variable low-high demand of cooked food during working hours, thereby, non-consumed food pile up.

Recyclable materials like paper based materials, plastic, glass and metal containers are available in the surrounding. The open campus tends to attract these recyclable items that end up as a land-fill in surrounding areas.



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Hazardous Waste – College campus does not produce chemical / biological laboratory waste. However, RO sludge, cosmetics / paints, cleaning services and detergents eventually become waste as well.

Construction debris and waste – College campus generates construction debris and waste material. Recycling of the debris and waste for other purposes is recommended

Recommendations – Waste Management

- College may tie-up with external CPCB/ SPCB authorised agencies for collection, proper disposal and maximum utilization of e-waste, hazardous waste.
- College authority may initiate proper disposal method and advanced coupon-purchase system in the common canteen to reduce food waste. In addition, the college should promote hygienic low calorie ‘home style’ food to attract young students towards eco-awareness.
- The college authority should immediately install Recyclable materials collection bin and sell /auction to the scrap vendors time to time.
- Signage on ‘Reduce-Recycle-Reuse’, ‘Litter free campus’, and ‘Ban Single Use Plastic’ to be placed at appropriate places for awareness.



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1.Green Campus and Environmental Monitoring

The college is geographically located in rural context with close proximity to the Kansavati river. The natural surrounding provides a green feel to the campus.

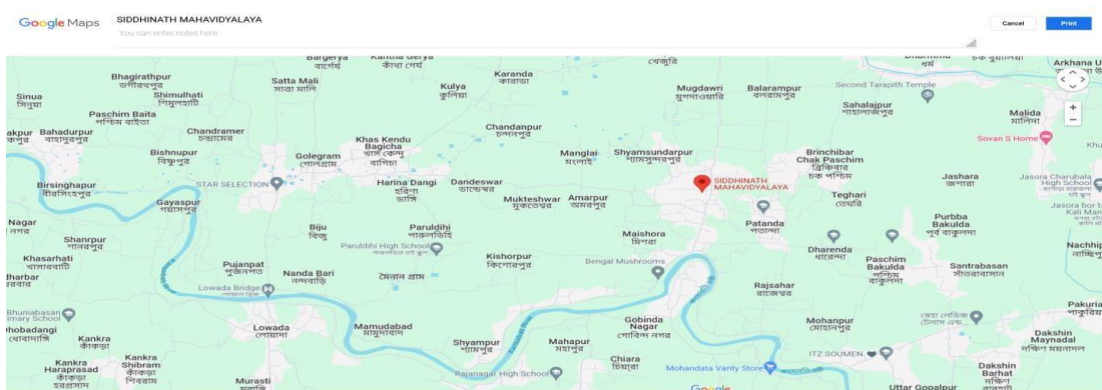


Figure 4: Location and surroundings of Siddhinath Mahavidyalaya (GoogleMaps) College campus has 430 sqm of lush greenery, garden and 42 number of trees. College campus has 01 pond.



Figure 5: Greenery in campus, Siddhinath Mahavidyalaya



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Figure 6: Campus greenery, Siddhinath Mahavidyalaya



Figure 7: Campus greenery, Siddhinath Mahavidyalaya



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Use of Bicycle

The institute encourages the students and other members to use bicycle that are zero-emission modes of transportation.

Recommendations – Green campus and Environmental monitoring

- The college should put local / scientific names on all trees to create a knowledge environment
- The ‘Save Water’, ‘Save Energy’, ‘Save Environment’ signage to be placed in appropriate locations
- The Environment Management Plan (EMP) to be issued by the college for measuring, monitoring the environmental mitigation and the signage containing aims & objectives are to be placed in appropriate places within campus.

Conclusion

Siddhinath Mahavidyalaya is a college that predominantly focuses on social science and humanities courses. However, the environmental protection initiatives taken by the management are substantial. The installation of solar panel, environmental awareness programmes, greenery preservation in campus is highly appreciable. Few recommendations were made to lead into greener prosperous future in context of Green Campus.



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Scope

Energy consumption by equipment/ appliances in buildings and outdoor places

Aims and Objectives

1. To assess energy consumption and energy management plans of Siddhinath Mahavidyalaya.
2. To identify the energy efficiency, conservation and energy savings opportunities within the premises

Observation

1. Units consumed from the State Electricity Board supply

The electrical equipment are located in college campus that includes faculty room, principal cabin, office, library, classrooms, student common room, canteen, open ground, washrooms and support services storage etc.

The Figure 1, shows the consumption pattern, which is based on the data provided by the college.



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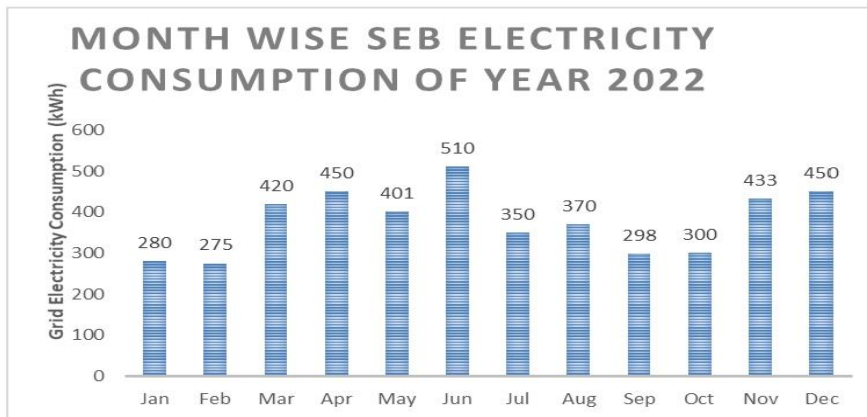


Figure 1: Energy consumed by electric equipment in the year 2022

The college has installed solar power plant. The energy harnessed in Year 2022 is provided in Figure 2.

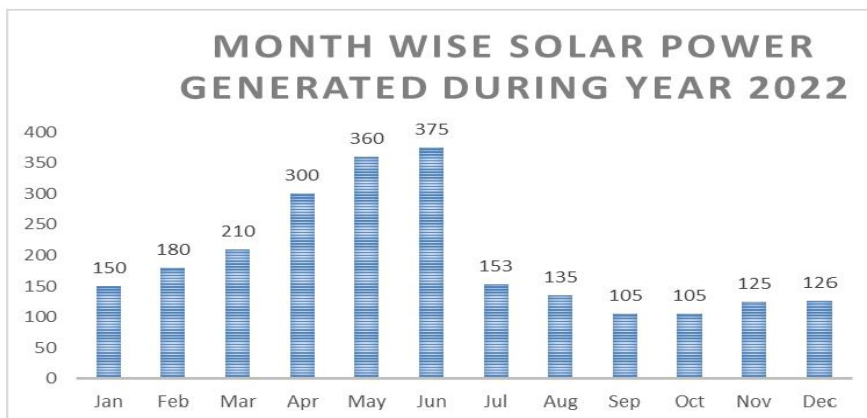


Figure 2: Solar plant and Solar powered equipment output, year 2022



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2. Inventory Analysis

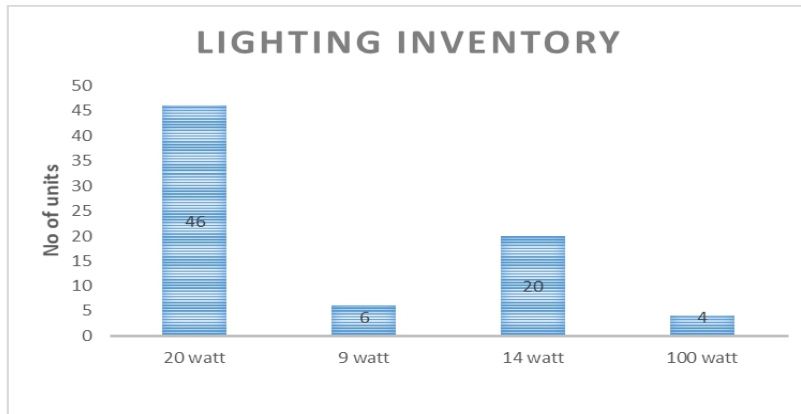


Figure 3: Consumption by lighting units within campus of Siddhinath Mahavidyalaya, Panskura.

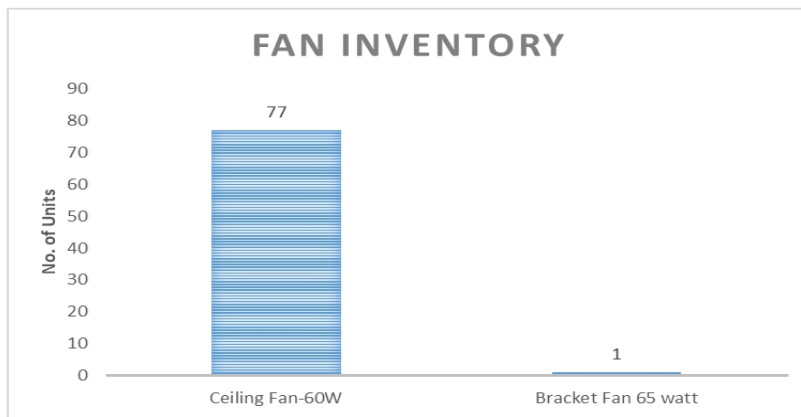


Figure 4: Consumption by Fan within campus of Siddhinath Mahavidyalaya, Panskura.



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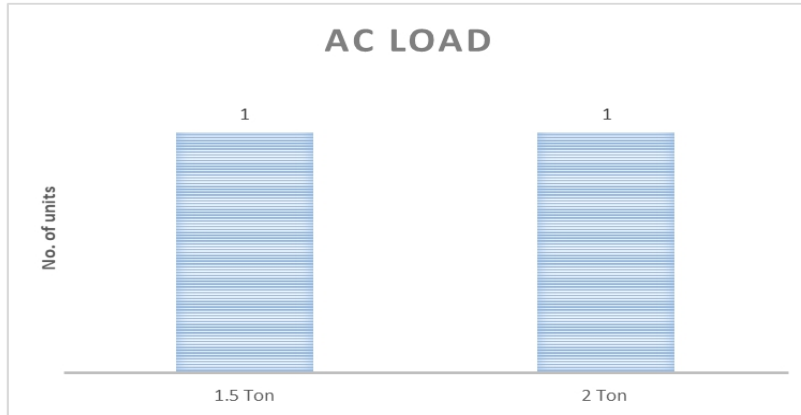


Figure 5: Consumption by AC units within campus of Siddhinath Mahavidyalaya, Panskura.

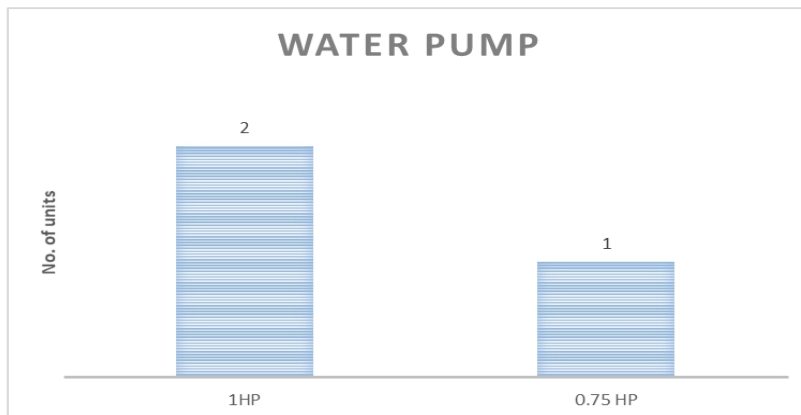


Figure 6: Consumption by motors used for pumping water



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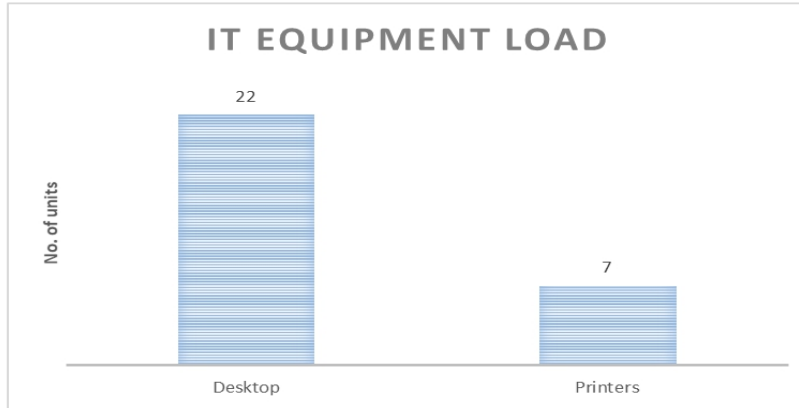


Figure 7: Consumption by electronic appliances used specifically for IT

3. Energy Consumption

Table 1: Annual consumption by electrical appliances and equipments within campus of Siddhinath Mahavidyalaya, Panskura.

Sl. No.	Appliances and Equipment's annual usage	Energy Consumption (kWh) per yr., approx.
A	Lighting Inventory (180 days, 6h / day)	
	20 watt	994
	9 watt	58
	14 watt	302
	100 watt	432
B	Fan inventory (7 months, 4h/day, 20 day/ month)	
	Ceiling Fan-60W	2587
	Bracket Fan 65 watt	36
C	AC inventory (4 months, 20 day/ month, 4 h/ day)	
	1.5 Ton	480
	2 Ton	640
D	Water Pump inventory (2h, 280 days)	
	1HP	418
	0.75 HP	209
E	IT equipment inventory (2h,150 days)	
	Desktop	1320



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	Printers	105
F	Other load taking units	—
	Water Chiller	—
	Drinking Water Purifier	—
G	Grand Total (A+B+C+D+E+F)	7,581

4. Recommendations

Power consumption depends on the extent of use and the energy rating of the appliances / equipment. Higher star ratings indicate greater energy efficiency, meaning the appliances will use less electricity.

1. During next purchases, tenders may be floated to procure appliances of BEE, above three star, rating to reduce energy consumption.
2. Installation of sensor based electrification items like fans, lights, pump etc. can save energy.
3. Communicating the awareness, to all stakeholders, that unnecessary use of lights, fans and computers at places where no one is doing any work, may reduce energy consumption.
4. Availing the opportunity to install rooftop solar panel off-grid/ on-grid system may reduce the dependence on the power supply by the State Electricity Board.