

CERTIFICATE OF COMPLETION

This is to certify that

The Bhaskar Pandurang Hivale Education Society's

Ahmednagar college

Station Road, Ahmednagar - 414001, Maharashtra

has successfully completed

Green Audit

Dated 10/04/2023

The Report prepared by Shashwat Eco Solution Foundation, Pune

Audited by



Mrs Manisha Gawande

Lead Auditor ISO 14001 – UDN 267863



Green / Environment Audit Report

The Bhaskar Pandurang Hivale Education Society's
Ahmednagar college
Ahmednagar, Maharashtra

Audited by:

Mrs Manisha Gawande

Lead Auditor ISO 14001 – UDN 267863

Prepared by: Shashwat Eco Solution Foundation, Pune

YEAR: 2022

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Abbreviations:

Kw: Kilo watt
 lit: Litre
 RWH: Rainwater Harvesting
 IEC: Information, Education and Communication
 Yr: Year
 Kg: Kilogram
 Cu M: Cubic Meter
 Sq M: Square Meter

Reference

<https://www.encon.be/en/calculation-co2-offsetting-trees>

reference for oxygen by single tree per year:

<https://www.usda.gov/media/blog/2015/03/17/power-one-tree-very-air-we-breathe#:~:text=It%20is%20proposed%20that%20one,have%20had%20on%20our%20environment.>

1 pound = 0.453592 kg

<https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>

Disclaimer

Green Audit team has prepared this report for The Bhaskar Pandurang Hivale Education Society's Ahmednagar college, Ahmednagar, based on input data submitted by the representatives of college, complemented with the best judgement capacity of expert team. While all reasonable care has been taken in its preparation, details obtained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best judgement and no representation, warranty or undertaking, expressed or implied is made and no responsibility is accepted by audit team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report

Prepared by

Shashwat Eco Solution Foundation.

Authorised Signatory

Audited by

Mrs Manisha Gawande

ISO certified Auditor – UDN 267863

A. Background

I. About Ahmednagar College, Ahmednagar



Figure 1: College building Photo

The Bhaskar Pandurang Hivale Education Society's Ahmednagar college is established in 1947 as a first center of higher education in Ahmednagar District. It is first and oldest institution of Ahmednagar District. A premier institution of learning for traditional as well as new age subjects. The name of the college is synonymous with Quality Education. It is affiliated to the University of Pune.

II. About Green Audit:

As we know about climate change and impact on livelihood. Our resources are limited and there is need to optimize the resources for future generation. Also a need is to create socially, environmentally responsible future citizen and so' Catch Them Young! The Green Audit is one of mandate for educational Institution under NAAC -7.1.6 Quality audits on Green / environment regularly undertaken by the Institution.

a. Objective

This audit gives insight of Water foot print, carbon foot print, waste management and energy conservation

b. Methodology and Scope

i. Methodology

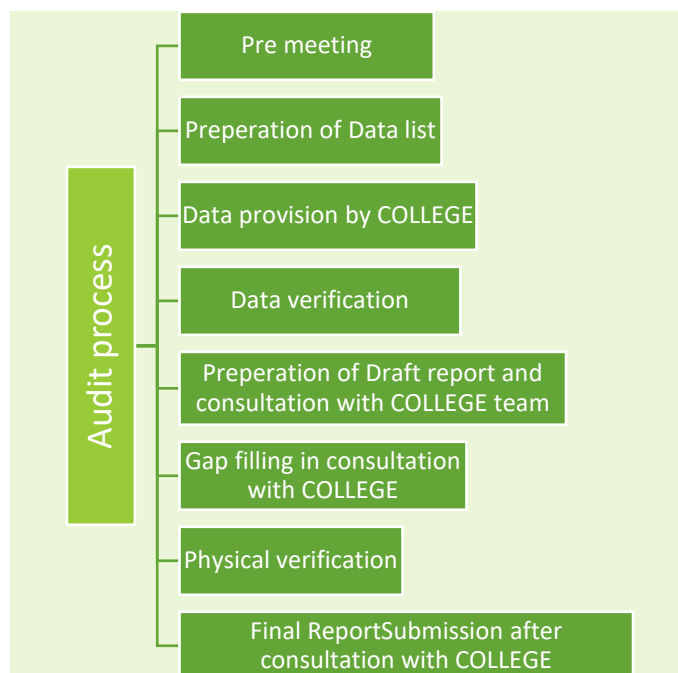


Figure 2: Green Audit process chart

ii. Scope

1. 'Green Audit' is an audit of environmental initiatives taken by educational Institutions i.e. Colleges on the basis of data available le from colleges. and the components as on executed by the Institution under below areas:
2. Solar initiative at college.
3. Power saving initiative.
4. Water saving measures and rainwater harvesting initiative
5. Waste segregation and disposal for Solid waste / composting of kitchen waste if any.
6. Pre- treatment in the form of septic tank and disposal in drainage for Liquid waste
7. Green belt (no of trees count) for carbon di oxide reduction.
8. Green learning initiative for students and any project on environment by students

c. Team of Expert:

Name of Expert	Year of Experience	Brief Experience
Mrs Manisha Gawande	25+	Certified Lead Auditor for ISO 9001, 140001 and NABL certification
Mrs Pradnya Thakur	25+	<ul style="list-style-type: none"> • Expertise in Sanitation, Solid Waste management and Water • Impact and Need assessment study • Strategy and planning • Environment Audit of Industries • Trainer for WASH
Dr Aditi Kale	25+	<ul style="list-style-type: none"> • Statistician • Management consultant

B. Baseline Data:

I. Demographic Profile of Institute:

a. Population

1. College Population:

Table 1: Population data

Sr No	College Population	Number
A	Students	4424
i	Boys	
ii	Girls	
B	Teachers	118
i	Male	90
ii	Female	28
C	Non-teaching staff	67
i	Male	62
ii	Female	5
D	Cleaning Staff	5
i	Male	2
ii	Female	3
	Total	4614
	Around	Around 5000 students

2. Hostel Population:

Hostel	Capacity of Students accommodation	Actual students' accommodation at hostel	No of Rooms	Toilet seats	Bathroom	Wash Basins
Boys Hostel		180		77		14
Girls Hostel		90		70		12
Teaching staff quarters	5	23		5		3

C. Green Components of Audit

I. Water

a. Water Consumption:

1. Source of Water: Ahmednagar Corporation and wells / Borewells in the campus
2. Total Water consumption: around 36.43 cu M/day so 7285.6 Cum/year
3. Other purpose water consumption is 26.11 Cu M /day
4. Drinking water quantity: 10.32 cu M/day
5. Waste Water Management: Water is connected to sewer line of Nagar Municipal Corporation

b. Water Treatment:

1. Drinking Water treatment system: Total 9 Water purifiers in entire campus. Capacity of purifiers 1 filters of 20, 5 filters of 50, 1 filter of 100 and 1 filter of 1000



Figure 3: Drinking water filter system at every floor with cooler

c. Water Harvesting

- Number of borewells - 3
- Rooftop rainwater harvesting is implemented rooftop area 3202 sq meter
- Annual rainfall in Ahmednagar is 531 mm.
- Percolation Pit Size – 8800 cu ft = 246.4 CuM
- Water Harvesting Potential is around **1440 cu M / Year**
- Technology used is ground water recharge with percolation pit.

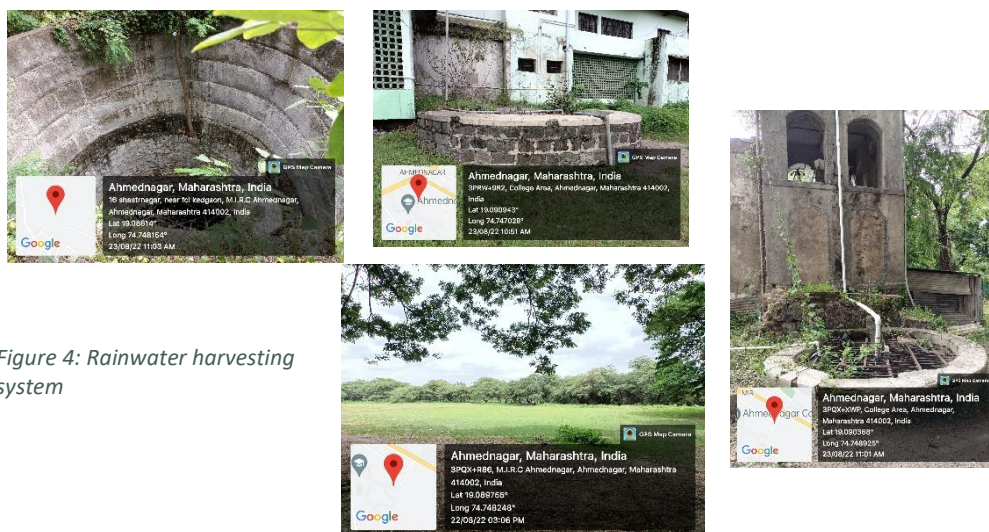


Figure 4: Rainwater harvesting system

II. Sanitation

a. Toilet infrastructure

Table 2: Sanitation Infrastructure

Toilet units	Urinals	Toilet pans	Wash basins
Gents		76	15
Ladies	-	59	5
Staff Male		18	1
Staff Female		10	1

Waste water management

i. Waste water generation:

Waste water generation is around 23.5 cum/day i.e. 4699.5 Cum/Year

ii. Treatment and disposal / reuse:

Waste water generated is discharged in the sewer line of Nagar Municipal Corporation.

III. Solid Waste Management

a. Waste generation:

- Total Waste generation: Considering the institution campus and Hostel and canteen waste generation per person per day is considered as 450 g/day/P. So total waste generation is projected as 1500kg/day = 1.5 t/day
- Dry Waste generation: 850kg/day

b. Segregated bins at the campus:



Figure 5: Two bins for waste segregation

c. Composting of wet waste:

No composting system in the campus

d. Disposal of dry and other waste:

No dry waste management. Waste is given to Ahmednagar Corporation

i. Collection and disposal of sanitary napkins:

- Sanitary napkin Vending machine and no incinerator in each toilet in each ladies' toilet block is fitted.



Figure 6 Vending Machine

IV. Clean Air

a. Plantation in the premises

Table 3: Existing plants in the campus

Sr No	Trees	Number
A	Big Trees	1120
B	Shrubs	987
B	Middle size plants	2465
	Total	4572

Area of plantation covered: 1,71,182 Sq meter



Figure 7: Plantation in the campus

- CO₂ is one of the most important greenhouse gases. Trees extract CO₂ from the air and convert it into oxygen and plant material through photosynthesis.
- Annual CO₂ offsetting rate varies from 21.77 kg CO₂/tree to 31.5 kg CO₂/tree. To compensate 1 tonne of CO₂, 31 to 46 trees are needed
- On this basis Plantation of 4572 trees consumes 100 MT of CO₂.

b. Ambient air quality:

- The average passenger vehicle emits about 404 grams of CO₂ per mile i.e 269gm CO₂/km
- No Ambient Air monitoring done by the Institution.

Conclusion:

Recommended to do Ambient air monitoring

V. Energy

a. Consumption:

- Yearly average energy consumption 50 to 60 units / month

b. Conservation measures

i. Bulb replacement

- Old bulb– 585 - 34540 Kwh power consumption
- Replacement to LED – 623 – 14300 kwh power consumption
- New installation of LED – 257 nos - 4901 Kwh power consumption.

Conclusion is 15699 Kwh power saving 6279.6 kg CO2 conservation.

- 1,000 kWh of electricity: 400 kg of CO2
- 1,000 kWh of natural gas: 181 kg of CO2
- 1L of fuel oil: 2.66 kg of CO2

ii. Solar system

Solar system is setup at Hostel building for water hot water at 60°C with following details:

- Power requirement - 23251.5 Units / per month
- Units generated by Solar system - 4780.06 units / Month
- Power given to grid – 73.72 units / Month i.e 884 Units / Year

Conclusion

- 20.55% of energy requirement is subsidized by Solar system
- 353.6 kg CO2 is conserved annually.

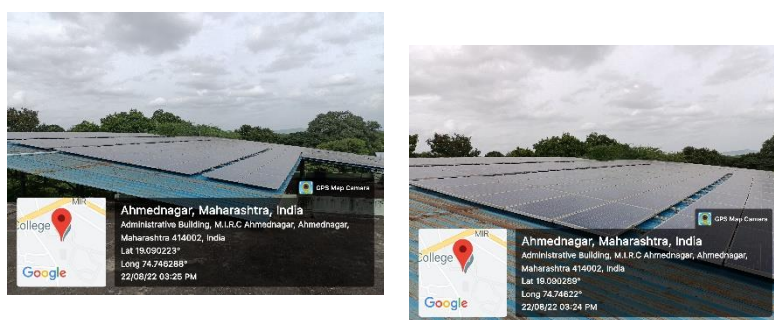


Figure 8: Solar system Photo

D. IEC with Students and Teachers

Sr. No	Date of Activity	Name of Activity	No of Participants
1	25 th June 2019	Tree plantation at Kapurwadi	16
2	21-Sep-19	Flood Prone Rescue Operation Camp University	3
3	24 July 202	Tree plantation Pakhwada	67
4	12 th Dec 2020	Cleaning awareness program	1000
			1086

E. Conclusion and Way Forward:

I. Water

Conclusion:

- Total water consumption– 36.43 cu M/day so **7285.6 Cum/year**
- Water Conservation with ground water recharge - **1440 cu M / Year**

Way Forward

- Rainwater harvesting of other building's roof tops also need to be done to ensure more recharging of rainwater.
- More IEC need to conduct for water conservation measures
- Water saving fixtures need to place at wash basins and to tabs.

II. Waste

Conclusion:

- Total Solid Waste generation– 1500kg/day = 1.5 t/day
- Total Wet waste generation – 650 kg/day.
- Need of Wet Waste Composting System
- Recyclable waste needs to collect separately for recycling and non-recyclable waste disposal need to clarify.

Way Forward

- No wet waste composting system at college place. It is recommended onsite composting and use of composting in the premises.
- Rainwater harvesting of entire roof top should be done in future.
- IEC need to conduct for segregation of waste and overall waste management for students and staff of college
- At every disposal point segregated bins should be placed.

III. Energy Conservation

Conclusion:

- Energy conservation initiatives of Solar system is good.
- Conservation measures can strengthen.

Way Forward

- LED bulb and motion sensor can initiate.
- IEC need to conduct for energy conservation.
-

IV. Air:

Conclusion:

- Plantation is done at optimal places available in the campus helps in carbon reduction.
- No ambient air monitoring observed.

Way Forward

- Ambient air monitoring need to be done twice a year pre and post monsoon.
- IEC need to be strengthen for students and teachers.
- Carbon foot print need to establish
- Climate change approach need to focus
- Efforts need to strengthen on Biodiversity activities.
