



**Environment Audit Report
Arvindbabu Deshmukh Mahavidyalaya
Bharsingi, Dist. Nagpur**



**Environment Audit Report
CONSULTATION**



Arvindbabu Deshmukh Mahavidyalaya

**Bharsingi, Tah. Narkhed, Dist. Nagpur
Year-2021-22**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

Flat No. 201, OM Apartment, 214 Indrapuri Colony,
Bhawarkuan, Indore – 452 001 (M. P.), India

0731-4948831, 7869327256

Email ID: eempirical18@gmail.com

www.eeplgroups.com

(2021-22)



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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of **Arvindbabu Deshmukh Mahavidyalaya, Bharsingi, Dist. Nagpur** for giving us an opportunity to conduct environment audit for the college

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.



Rajesh Kumar Singadiya

(Director)

M.Tech (Energy Management), PhD (Research Scholar)
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
(BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal M.P.
Lead Auditor ISO50001:2011 [EnMS] from FICCI, Delhi
Certified Water Auditor (NPC, Govt of India)
Chartered Engineer [M-1699118], The Institution of Engineers (India)
Member of ISHRAE [58150]



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Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited**,

- ✚ Mr. Rajesh Kumar Singadiya [Director & Accredited Energy Auditor AEA-0284]
- ✚ Mr. Rakesh Pathak, [Director & Electrical Expert]
- ✚ Mrs. Laxmi Raikwar Singadiya [Energy Engineer]
- ✚ Mr. Sachin Kumawat [Sr. Project Engineer]
- ✚ Mr. Ajay Nahra[Engineer]
- ✚ Mr. Charchit Pathak [Mechanical Engineer]
- ✚ Mr. Aakash Kumawat [Jr. Engineer]
- ✚ Mr. Mohan Choudhary [Sr. Electrician]

Green Monitoring Committee


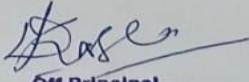
 Prakash Pawar Officiating Principal	STD : 07105 NAAC Re-accredited with 'B' Grade VSPM Academy of Higher Education ARVINDBABU DESHMUKH MAHAVIDYALAYA BHARSINGI, Dist. Nagpur - 441305	Ph : 233329
Ref.No. : ADM/2022/346		Date : 13/09/22
Energy, Environment & Green audit committee		
Energy, Environment & Green audit committee consist of following members.		
Sr. No.	Name	Designation
1.	Dr. P. D. Pawar	Chairperson
2.	Dr. M.M. Varma	Convener
3.	Dr. S. B. Thakare	Member
4.	Dr. S. P. Gudadhe	Member
5.	Dr. A. R. Gharpure	Member
6.	Dr. A. L. Gadre	Member
7.	Dr. S. R. Bansod	Member
8.	Mr. S. R. Sinkar	Member
9.	Mr. B. B. Madhavi	Member
10.	Mr. C.B. Barapatre	Administrative Member
This committee working period is for 03 year up to June 2024 and after that committee will be reconstructed.		
 Off. Principal Arvindbabu Deshmukh Mahavidyalaya, Bharsingi Dist. Nagpur		
REDMI NOTE 8 PRO AI QUAD CAMERA e-mail : admv_bharsingi@rediffmail.com website : www.adm.edu.in, Ph : 07105-233533, 233330		



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Integrated Policy

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Ref.No. : ADM/2022/346		Date 13/09/22
Integrated Energy, Environment & Green Policy		
<p>Management of our institution is committed to go green for making our nation to Atma-Nirbhar (Self-Sustainable) in area of energy and environment.</p>		
<p>Our emphasis is to:-</p> <ul style="list-style-type: none">• Ensure continuous enhancement in our energy and water conservation and usage.• Continuous monitoring the energy consumption pattern through periodic reviews and using latest informative system.• Procure and use energy efficient equipment's and products.• Create awareness regarding necessity of energy conservation and making environment pollution free to all the stakeholders by arranging awareness activity such as seminar, webinar, rallies and guest lectures etc.• Carry out regular energy, environment and green audit by certified auditors to identify the areas for improvement.		
 Off. Principal Arvindbabu Deshmukh Mahavidyalaya, Bharsingi Dist. Nagpur		
<p>REDMI NOTE 8 PRO AI QUAD CAMERA e-mail : admv_bharsingi@rediffmail.com website : www.adm.edu.in, Ph : 07105-233533, 233330</p>		



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EXECUTIVE SUMMARY

The executive summary of the environment audit report furnished in this section briefly gives the identified water conservation measures that can be implemented in a phased manner to water conservation and increase the productivity of the college

AUDIT RECOMMENDATION

+ FRESH WATER MONITORING SYSTEM:

- Installation of “**Cloud based (IoT based) ground water extraction monitoring system**” for well to quantify fresh water consumption per day in the college
- Install water flow meters (Mechanical or Electronics) on bore well distribution network, like college buildings for quantity per day water consumption and waste water generation in the college campus.

+ Waste Water Treatment Plant

There is requirement to install sewerage treatment plant (STP) for waste water generated from various activities in college campus. All waste water generated from drinking washing etc. activity is collected in separate tank and it should be treated in propose STP Plant

+ DRIP WATER IRRIGATION SYSTEM FOR GARDENING.

- Use drip water irrigation system for gardening.

+ USE EFFICIENT WATER TAPS :-

- Water saving taps either reduce water flow or automatically switch off to help save water. So, it is highly recommended to install efficient water taps in college campus to reduce water consumption



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✚ USE EFFICIENT URINAL TAPS: -

- Replacing these inefficient fixtures with water sense labelled flushing urinal can save between 0.5 to 04 litter per flush without sacrificing performance. Installing water saving flushing urinal will not only reduce water use in facilities but also save pumping energy on water bills.

✚ INSTALLATION OF WATER OVERFLOW SENSOR IN TANKS: -

It was observed that water overflow in overhead tanks after tank filling. So, it is recommended installation of water overflow sensor to avoid water overflow.

✚ WATER SPRINKLER SYSTEM

There are good potential to install water sprinkler system for lawn area in college. It will be reduced water consumption of college campus



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CHAPTER-1 INTRODUCTION

1.1 About College

Arvindbabu Deshmukh College of Arts, Science and Commerce also well known as AD College, was established in 1986. In its journey during the past 35 years it has grown in strength from 75 students from its inception to a total strength of 2000 students today. Also there are 1300 students studying in YCMOU through this college. Under the affiliation of Rashtrasant Tukadoji Maharaj University of Nagpur. College offers undergraduate and post graduates programs like B.A., B.Com. From 1986 and later in 2008 B.Sc. and M.A. has been started. The college is also identified as community college under scheme of UGC and running a skill oriented diploma course in Welding and Fabrication. Beside that the college also runs as-on courses like Fashion designing and Communicative English. Listed in first top ten for the graduation course in mass media. College having units such as N.S.S. of 250 students, college awarded with best college for N.S.S. by R.T.M.N.U., Nagpur. College having very active sport department. Every year students are performed at National, State, University level and received Gold, Silver and bronze medal. Our college organized International, National, State and University level Conferences, Seminars and Workshops in various subjects. College is popular for its cultural, sports and drama activities and infrastructural facilities.

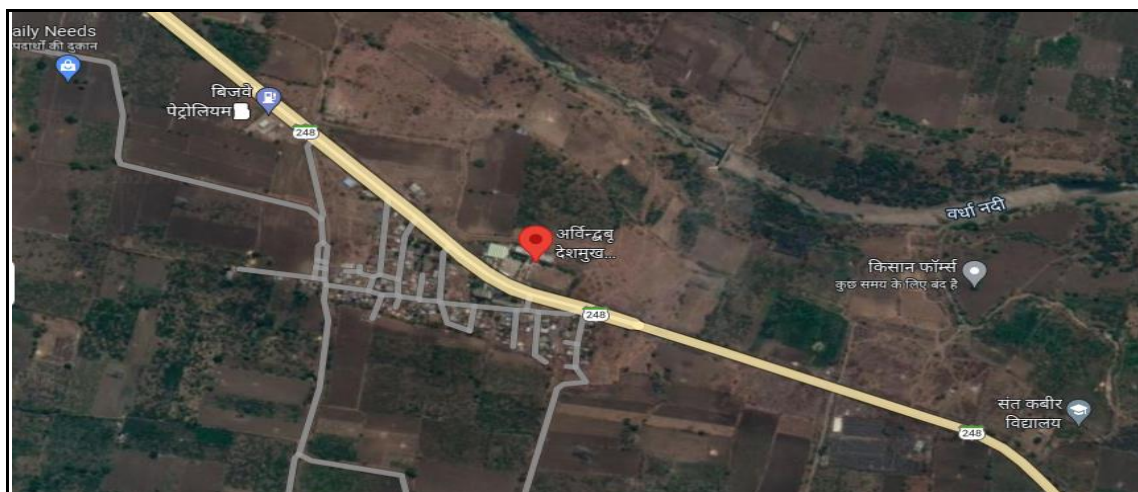


Figure 1.1: - Satellite Image of Arvindbabu Deshmukh Mahavidyalaya



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Vision and Mission:-

VISION

To become a centre of quality education by promoting high academic and social pursuit and competencies of students of rural region for all round development

MISSION

- To impart higher education for all round development of students of rural area and provide them an opportunity to made them competent for development in society
- The priority of the institution is to bring academic excellence along with personality development to compete with the rest of the world.
- The institution is located in the remote area so maximum students belong to backward communities and socio – economically weaker section so provide them opportunity to make themselves competent.
- To provide opportunity in future by providing them quality education, skilled base programme, competitive examination guidance, sports facility etc.

Sr. No.	Floor	Department
1.	Ground floor	Administration office, Principal cabin, Classrooms
2.	First floor	Examination cell, IQAC room, Classrooms, Computer lab
3.	Second Floor	Science Laboratory, Audio visual hall, classroom, Girls common room
4.	Third floor	Classrooms, Boys common room
5.	Indoor stadium area	Indoor stadium, gymnasium, college canteen,
6.	Girls hostel	Hostel rooms, Canteen, warden room
7.	Playground	Playground, Basketball court, parking

Name of Buildings in campus and Build up area of Buildings



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Sr. No.	Building	Department
1.	Main Building	3033.115 Sq. M.
2.	Indoor	1176. 15 Sq. M.
3.	Hostel	1458.114 Sq. M.
4.	Canteen	140 Sq. M.

Number of courses:-04

Name of courses: - Bachelor of Arts, Bachelor of Science, Bachelor of Commerce, Master of Arts (Marathi)

Sr. No.	Name of teaching Departments
1	Department of Marathi
2	Department of English
3	Department of History
4	Department of Political science
5	Department of Economics
6	Department of Music
7	Department of Home-economics
8	Department of Chemistry
9	Department of Botany
10	Department of Zoology
11	Department of Physics
12	Department of Mathematics
13	Department of Commerce

1.2 About Environment Auditing



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Environment audits can be a highly valuable tool for college in a wide range of ways to improve their energy, environment and economic performance. While reducing wastages and operating costs. Environment audits provide a basis for calculating the economic benefits of water conservation projects by establishing the current rates of water use and their associated cost.

1.3 Objectives of Environment Audit

The general objective of water audit is to prepare a baseline report on water conservation measures to mitigate consumption, improve quality and sustainable practices.

The specific objectives are:

- ✚ To monitor the water consumption and water conservation practices.
- ✚ To assess the quantity of water, usage, quantity of waste water generation and their reduction within the college.

1.4 Target Areas of Environment audit

This indicator addresses water sources, water consumption, irrigation, storm water, appliances and fixtures aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

1.5 Methodology followed for conducting Environment audit

Step 1: Walk through survey



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- ✚ Understanding of existing water sourcing, storage and distribution facility.
- ✚ Assessing the water demand and water consumption areas/processes.
- ✚ Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection

- ✚ Analyse historic water use and wastewater generation
- ✚ Field measurements for estimating current water use
- ✚ Metered & unmetered supplies.
- ✚ Understanding of “base” flow and usage trend at site
- ✚ Past water bills
- ✚ Wastewater treatment scheme & costs etc.

Step 3: Site Environment Audit Planning (based on site operations and practices)

- ✚ Preparation of water flow diagram to quantify water use at various locations
- ✚ Wastewater flow measurement and sampling plan

Step 4: Conduction of Detailed Environment Audit & Measurements

- ✚ Conduction of field measurements to quantify water/wastewater streams
- ✚ Power measurement of pumps/motors
- ✚ Preparation of water balance diagram
- ✚ Establishing water consumption pattern
- ✚ Detection of potential leaks & water losses in the system
- ✚ Assessment of productive and unproductive usage of water
- ✚ Determine key opportunities for water consumption reduction, reuse & recycle.

Step 5: Preparation of Environment Audit Report

- ✚ Documentation of collected & analysed water balancing and measurement details
- ✚ Projects and procedures to maximize water savings and minimize water losses.
- ✚ Opportunities for water conservation based on reduce/recycle/reuse and recharge option

CHAPTER- 2

WATER CONSUMPTION AND WASTE WATER SOURCES

2.1 Details of Source of Fresh Water and Use Areas:



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The main source of freshwater is bore well & open well for the college. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project. Details of the bore well are given in table2.1

Table: 2.1 Details of Fresh water sources

Sr. No	Source of Water	Location	Depth (ft/m)	Type of Pumps	Rated (HP)	Rated Flow (m ³ /hr)	Running Hr per day
1	Bore well	College Campus	480 ft.	Submersible	7.5	20	
2	Open well	Near Jam River	50 ft.	Submersible	7.5	20	1
3	Hand Pump	College Campus	60 ft.	-	-	-	-

Photographs of water source



Figure:- 2.1 Bore well in college campus

2.2 Water Accounting & metering system

It was observed that there is requirement of water flow meters on bore well quantify per day ground water extraction from different sources



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Fig:- 2.3 Requirement of water meter on bore well

Observation:-

Environment audit team observe that there are required water meter on bore well system.
So it is recommended to install water meter on bore wells to quantify of fresh water per day.

2.3 Water Storage Capacity in College Campus

There is different type of tank available in college for water storage like, RCC tank and PVC tanks.

Water storage tank in college campus

Type of Storage System	Location	Storage Capacity (m ³)
Tank	Admin Building	3
Tank	Admin Building	3
Tank	Admin Building	1
Tank	Canteen	1.5
Tank	Indoor stadium	2
Tank	Hostel	3
Tank	Hostel	1.5
Underground Tank	Hostel	5

Photograph of water storage tank



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2.4 Water use areas in college campus

Water is preliminary used for drinking, domestic, gardening and lab activity. Audit team visited various departments and buildings to determine appliances. The details of washroom, toilet and taps are given in table

Details of washroom and uses taps in various areas

Sr. No	Location	Hand Wash	Urinals	Toilets	Taps
1	Main Building	11	15	12	46
2	Indoor Stadium	06	2	12	22
3	Hostel Building	08	16	16	34

Photograph of water uses area in campus



2.5 Details of water cooler & RO college campus



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Details of water cooler in college campus

Sr. no.	Location	No of water cooler	RO plant
1	Main Building	10	1
2	Indoor stadium	02	
3	Hostel Building	04	
		16	1



RO plant in college campus

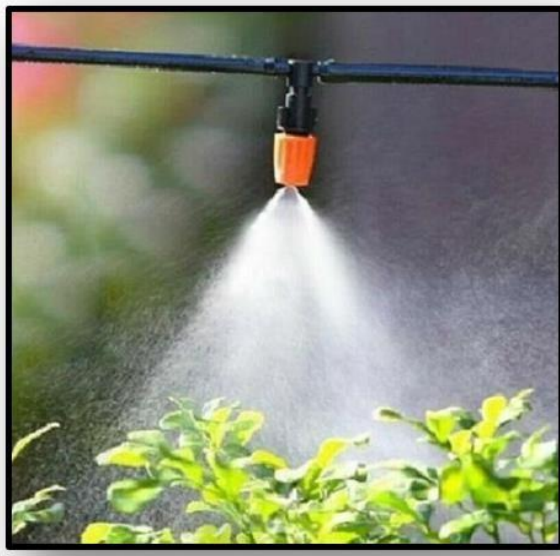
2.6 Fresh water uses for gardening:



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The one of major contribution from fresh water consumption is watering for other plants in college campus. There is good potential for water saving by adopt “Automatic Watering 360 adjustable misting nozzle irrigation dripper’s system” for plants. Adjustable drip irrigation tools to provide different amounts of water depending on the water requirements of different plants. The drip speed can be set as for indoor and outdoor plants.



Proposed Adjustable Misting Nozzle Irrigation Drippers Proposed water timer

2.7 Waste water generation sources: -

At present waste water generated from various departments canteen, & other activity like washrooms, hand wash and RO rejected etc.

Sr. No.	Location	Type of water used	Water consuming activities
1	Main Building	Fresh water	Drinking & Service
2	Indoor stadium	Fresh water	Drinking & Service
3	Hostel Building	Fresh water	Drinking & Service



CHAPTER- 3

RAIN WATER HARVESTING SYSTEM

3.1. Rain water harvesting systems

The rainwater harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later.

There are typically four components in a rainwater harvesting system:

- ✚ Roof Catchment.
- ✚ Collection.
- ✚ Transport.
- ✚ Infiltration or storage tank and use.

If rainwater is not harvested and channelized its runoffs quickly and flow out through storm-water drains. For storm-water management the recharge pits, percolation pits and porous trenches are constructed to allow storm water to infiltrate inside the soil.

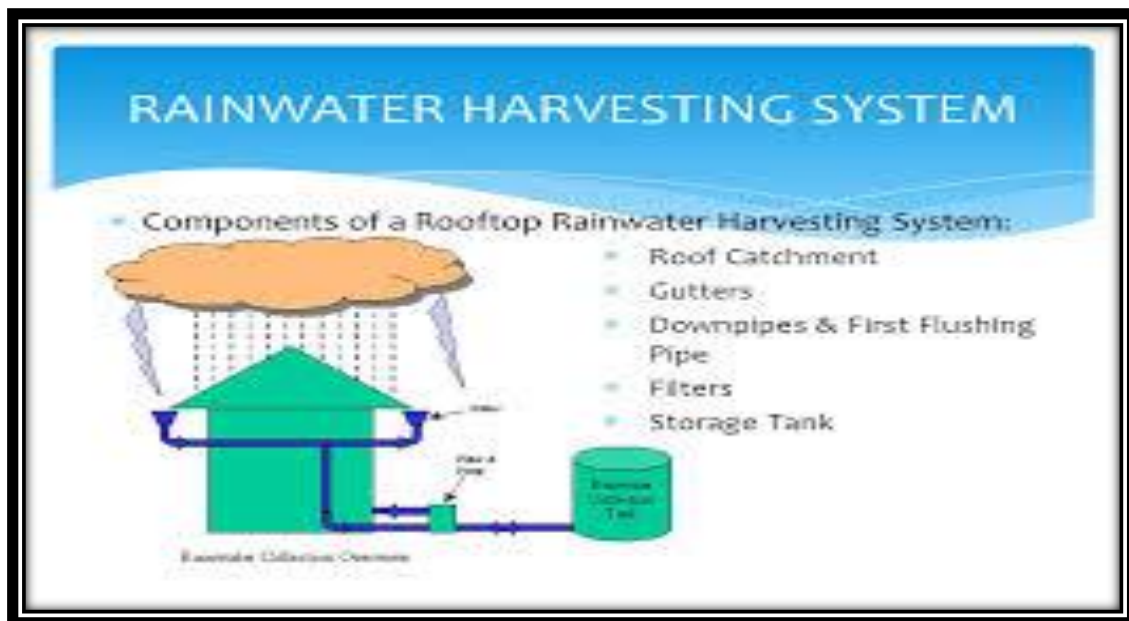


Fig: - 3.1 Components of a rooftop rainwater harvesting system

3.2 Potential of Rain Water Harvesting



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College has functional rain water harvesting unit through which the water from the terrace collected through the pipe and transport near the bore well and water bodies prepare in college premises. It help to maintain the level of water due to which problem of water scarcity solve to the some extent, especially in the season of summer. **It is appreciable.**





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END OF THE REPORT

THANKS