



ENVIRONMENT AUDIT REPORT CONSLITATION REPORT



MAHARSHI PANINI SANSKRIT EVAM VEDIC VISHWAVIDYALAYA UJJAIN (M.P)

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

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Environment Audit Report Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya Ujjain (M.P) Year 2022-23



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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)

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CERTIFICATE OF ISO 9001:2015

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	This is to certify that:				
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18-E SECTOR, SUDAM	A NAGAR, INDORE - 452009, MADHYA PR	ADESH, INDIA			
Has been assessed by	SAGACI and found to comply with the red	juirements of			
	ISO 9001:2015				
Quali	Quality Management System				
1	Certification Scope				
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ENVIRONMENT AUDIT TEAM

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

- **4** Mr. Rajesh Kumar Singadiya [Director & Accredited Energy Auditor AEA-0284]
- **4** Ms. Laxmi Raikwar [Energy Engineer]
- **4** Mr. Ajay Nahra [Sr.Project Engineer]
- **4** Mr. Charchit Pathak [Sr.Project Engineer]
- **4** Mr. Mohan Choudhary [Electrical Engineer]
- **4** Mr. Praveen Punasiya [Field Engineer]





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 conserve water and increase the productivity of the university.

RECOMMENDATION

FRESH WATER MONITORING SYSTEM:

- Installation of "Cloud based (IoT based) ground water extraction monitoring system" for bore well to quantify fresh water consumption per day in the university.
- Install water flow meters (Mechanical or Electronics) in distribution network, like university administration building, hostel, and guest house for quantify per day water consumption and waste water generation in the university campus.

DRIP WATER IRRIGATION AND SPRINKLER SYSTEM

- **Use drip water irrigation system for plant and trees.**
- Use sprinkler water system for Lawn area in the university campus.

SEWAGE TREATMENT PLANT (STP)

Install Sewage Treatment Plant (STP) to recycle of waste water. Output of STP plant can be utilized for watering in the garden. At present fresh water is utilized 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 the university campus to reduce water consumption.

USE EFFICIENT URINAL TAPS

Replacing existing inefficient fixtures with water sensor labeled flushing urinal can save between 0.5 to 04 liters per flush without sacrificing performance. Installation of water saving flushing urinal will not only reduce water use in facilities but also save money on water bills.





INSTALLATION OF WATER OVERFLOW SENSOR IN TANKS

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

INSTALLATION OF RAIN WATER HARVESTING SYSTEM:

Installation of Rain Water Harvesting (RWH) system in university campus as well as university residence area. Details of rain water harvesting potential are calculated and given in chapter-03.

WASTE WATER TREATMENT PLANT (ETP PLANT)

There is requirement to install Effluent Treatment Plant (ETP) waste water generated from lab activity from university department. All waste water generated from lab activity is collected in separate tank and it should be treated in ETP plant.

COLLECTION OF REVERSE OSMOSIS (RO) REJECTED WATER

There is good potential to collect rejected waste water from RO plants. It is highly recommended to collect above rejected water in separate tank and utilize for other activity like gardening and washroom.

CONDUCT QUALITY TEST OF DRINKING AND STP WATER

It is recommended to conduct periodically water testing and prepare a report of drinking and STP water outlet to ensure quality of drinking water as well as outlet of STP water is up to the mark.

AWARENESS AND TRAINING PROGRAMME

4 Conduct seminars, workshops and exhibitions on water and environmental education.





CHAPTER-1 INTRODUCTION

1.1 About University

The university expands in a lush green valley area in about 25 acres of land on Dewas road near the famous city of Ujjain. After entering through a grand gate, we enter the first academic campus of the university entitled "Panchavati". This complex gives the impression of an ancient Gurukul due to the five buildings with a huge platform in the middle and a beautiful fragrant garden. This place provides immense joy and peace to the new visitors. As we walk in the Panchavati along the greenery gradually we come across an elevated path which leads us to Patanjali Hostel. The mesmerizing university campus has foundation lands allotted for a spacious educational building, administrative building, and huge auditorium etc. where buildings are yet to be constructed. As we move towards the hostel complex, we can see a huge ground, where construction of a multipurpose playground, observatory etc. is proposed.



Figure 1.1: Satellite Image Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya Ujjain (M.P)





The university also contains an open auditorium, Nakshatravatika, Navagraha Vatika, Sarovar, Yagyashala, Library, Museum of Vedic Yagya Equipments, Astrology Laboratory, Psychology Laboratory, Language Lab, Sanskrit Gallery, Educational Subhashit Moral & a Fruit Garden. The university also plans to develop its concept of construction of residential houses. In future, this campus will be a center of attraction and inspiration for students, academicians and travelers from India and abroad.

VISION

🔸 भारतीयज्ञानपरम्परायाः निरन्तरप्रवाहाय नवाचाराः

To integrate the timeless wisdom of ancient Indian knowledge with modern innovation and progress across diverse disciplines

MISSION

म् प्राच्यसंस्कृतज्ञानविज्ञानपरम्परां प्रसारयितुं नवाचारैः सह परम्परागतशिक्षणपद्धतिम् अनुसृत्य शिक्षणं शोधकार्यं च कर्तुं दीपशिखारूपेण स्वस्य प्रतिष्ठापनम्।

- **4** To serve as a beacon of Sanskrit heritage, thereby fostering a dynamic learning environment where tradition meets innovation.
- Through rigorous scholarship, research excellence and community engagement we aim to be a catalyst for personal growth, cultural enrichment and societal information hence ensuring the enduring relevance of Sanskrit wisdom in the contemporary world





CORE VALUES

- **Excellence:** Commitment to high academic standards, rigorous research, and continuous improvement in teaching and learning.
- **Integrity:** Upholding honesty, ethical behavior, and accountability in all aspects of academic and administrative activities.
- **4 Diversity and Inclusion:** Fostering a diverse community of students, faculty, and staff.
- **Innovation:** Encouraging creativity, curiosity, and entrepreneurship in education, research, and community engagement.
- Collaboration: Emphasizing teamwork, interdisciplinary cooperation, and partnerships within the university and with external stakeholders to advance knowledge and solve global problems.
- Service and Social Responsibility: Engaging in meaningful service to the community, promoting civic engagement, and addressing societal needs through education, research, and outreach.
- Freedom of Inquiry and Expression: Safeguarding academic freedom, intellectual curiosity, and open exchange of ideas as fundamental principles of scholarly pursuit and democratic society.
- Global Citizenship: Cultivating global awareness, cultural competence, and a sense of responsibility towards addressing global issues and promoting peace and justice worldwide.
- Student-Centeredness: Prioritizing the holistic development, well-being, and success of students through personalized support, mentorship, and opportunities for growth and leadership.
- Sustainability: Committing to environmental stewardship, sustainable practices, and responsible resource management in campus operations and educational initiatives.
- These core values often serve as a compass guiding the university's decisions, actions, and priorities, shaping its identity and contributing to its impact on society.





1.2 School/Departments of University

- 🖊 School of Veda, Vedanta & Sahitya
- Lepartment of Veda
- 🕹 Department of Vyakarana
- **4** Department of Sanskrit Sahitya
- Department of Jyotish
- Lepartment of Vastu
- **U**epartment of Jyotirvigyan
- Lepartment of Vishishta Sanskrit
- Lepartment of Darshana
- ♣ Department of Yoga
- **4** Department of Education
- Department of SSPGVSK
- School of Kala
- 4 School of Darshana
- ♣ School of Prachin Vigyana

Facilities of the University Campus

- ↓ Wi-Fi enabled campus
- \rm Hostel
- \rm Canteen
- **4** Ragging free campus
- **4** CCTV surveillance campus
- 4 Girls' common room
- **4** Boys' common room
- 4 24x7 Security
- **4** Manuscript Repository
- **4** Sanskrit Fledged Campus

Academic

- ♣ ICT classroom
- **4** Computer lab
- Library
- Psychology Lab
- \rm Museum

Spiritual

- 4 Yoga and meditation center
- Lord Shiva temple
- Yagyashala
- \rm 🕹 Goshala



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1.3 University Infrastructure





Conference Hall



Library



Classroom



Yoga Bhavan

Classroom





1.4 Environment Monitoring Committee

विश्वविद्यालय avidyalaya दिनांक - 30/05/2023
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1.5 Environment Water Auditing

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

1.6 Objectives of Environment (Water) Audit

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

The Specific Objectives

- **4** 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 university.

1.7 Target Areas of Environment (Water) 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.





1.8 Methodology followed for conducting Environment (Water) audit

Step 1: Walk Through Survey

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

Step 2: Secondary Data Collection

- **4** Analyse historic water use and waste water generation.
- Field measurements for estimating current water use.
- **4** Metered & unmetered supplies.
- **Understanding of "base" flow and usage trend at site.**
- Past water bills.
- **Waste water treatment scheme & costs etc.**

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

- Freparation of water flow diagram to quantify water use at various locations
- **Waste water flow measurement and sampling plan**

Step 4: Conduction of Detailed Environment (Water) Audit & Measurements

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

Step 5: Preparation of Environment (Water) Audit Report

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





CHAPTER- 2 WATER CONSUMPTION AND WASTE WATER SOURCES

2.1 Source of Fresh Water and Use Areas:

The main source of freshwater is the bore wells for the university. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project. Details of the bore well & pumps are given in table 2.1

Table: -2.1 Details of fresh water sources.

Sr. No	Fresh Water Sources	Location	Motor Power (HP)	Input power (kW)	Water Flow (m ³ /hr)	Running hours /day	Total Water supply (m ³ /day)
1	Borewell-1	Panchavati Area	2	2.84	2.9	1	2.9
2	Borewell-2	Patanjali Bhavan	2	3.26	5.2	2	10.4



Patanjali Bhavan



Observation:

- It is observed that water flow meter is required to quantify the ground water extraction per day. It will help to monitor per day water consumption of the university.
- **4** The average fresh water extraction from bore-well is 13.3 m3 per day.





2.2 Water flow chart for Bore well no.1



2.3 Water flow chart for Bore well no.2







2.4 Water Storage Capacity in Various building

There are different type of tanks are available in the university campus for water storage like Underground RCC tank, PVC tanks.

Table: 2.2 Details of water storage capacity at Panchavati Area

Panchavati Area						
Sr. No.	Location	Tank capacity (Liter)	Tank quantity (No.)	Type of tank		
1	Registrar office	750	1	PVC		
2	Finance department	750	2	PVC		
3	VC office	750	1	PVC		
4	Underground tank	10000	1	RCC		

2.5 Photographs of water storage tanks



Water Storage Tank in the University Campus (Panchavati Pariser)

Patanjali Bhavan, Yogbhavan + Sandipani						
Sr. No.	Location	Tank capacity (Liter)	Tank quantity (No.)	Type of tank		
1	Patanjali bhavan	750	3	PVC		
2	Underground tank	10000	1	RCC		
3	Yoga bhavan	1000	1	PVC		

Observation:

It was observed that water overflow controller is required to control overflow from water tanks.



2.5 Photographs of water storage tanks



Fig: 1 Water Storage Tank of the University Campus (Patanjali Bhavan)

2.6 Water uses areas in the University Campus

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

Sr.	Name of Building/Department/Section	No of Taps	No of Washbasin	No of Urinal
1	Panchavati Area	2	1	0
2	VC Office	2	1	0
3	Registrar Office	2	1	2
4	Near Office	0	1	0
5	Yoga bhavan	4	1	0
6	Patanjali bhavan Ground floor	4	3	4
7	Patanjali bhavan First floor	6	2	2
8	Total	20	10	8

Table: 2.4 Details of washroom and Uses Taps in various areas





2.7 Waste water generation sources



Figure: -2.6 Waste Water Generation sources

At present waste water generated from, washrooms, and wash basins, is discharge into drain line. It should be collected and treated in STP plant. The outlet of STP system should be reused in other activity after that treated water should be reused in activities like gardening, toilet and wash room etc.

Observation:

Water generated from above area can be collect and treat in sewage treatment plant (STP) and after that output can be used in watering in the plant in the campus.





2.8 Fresh Water uses for Gardening

One of major contribution of fresh water consumption is watering for plants and garden in university campus. There is good potential for water saving by adopts "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.







CHAPTER- 3 RAIN WATER HARVESTING SYSTEM

3.1. Rain water harvesting system

There is good potential for develop rain water harvesting system in University .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.
- **4** Collection.
- **4** Transport.
- Infiltration or storage tank and use.

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









3.2 Rainwater Harvesting Potential of the university

The university has total build-up area is about 765.27 m². The average annual rainfall 0.943 m and runoff coefficient 0.88 are considered for commercial building. Accordingly, above figures and consideration, estimated rainwater harvesting potential for the university is about 635.05 m3/year. The following Mathematical Equation is used for the calculation.

RWH Potential = Rain fall (m) x Area of catchment (m²) x Run off coefficient



Figure:-3.2 Proposed Rainwater harvesting system





ANNEXURE-I ENERGY, ENVIRONMENT AND GREEN POLICY







Green Campus Policy

A Green Campus is a place where environment friendly practices and education combine to promote sustainable and eco-friendly practices in the campus. The green campus concept offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental conditions along with social and economic needs of the mankind.

The impact of humans on the environment is expanding, posing serious environmental problems. To reduce the negative impacts that human activity has on the ecosystem-effects that in turn change how we relate to the planet and to one another unprecedented effort is needed. To make a significant shift, it will be required to include all methods of problem solutions. In view of the above background, Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya has evolved its green campus policy so as to contribute maximum to mother earth and environmental protection.

Objectives of the Green Campus Policy

The objectives of green campus policy of the Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya Ujjain are as follows:

- To make all possible efforts to keep its premises, compound and surroundings green through creating awareness, plantation and protection of trees and plants etc.
- To contribute collectively in developing an eco-friendly sustainable campus and disseminate the concept of e-friendly culture to the nearby community and wherever possible.
- To continuously improve the efficient use of all resources, including energy and water, and to reduce consumption and the amount of waste produced, recovering and recycling waste where possible.
- To spread awareness about environmental issues among students and staff of the Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya in particular and the community in general by way of various methods.





- To develop the institution on a self-sustainable basis in the areas of power, water and cleanliness without harming nature in any manner.
- To discourage the use of plastic made products and encourage a suitable waste management mechanism.
- To make use of non-conventional methods of energy in the campus.
- To keep the university campus green, clean and environmentally friendly.







Green Campus Protocol of the University As part of its initiatives for environmental sustainability, the following instructions and guidelines are implemented by the university: No body will harm any tree, lawn and plants in the campus and strict action will be taken if found doing this. · Spreading awareness among the staff, faculty and students about the advantages of green campus. Restriction on entry of vehicles in the campus compound. Construction of pedestrian friendly pathways. Warning to both teacher and students about the dis advantages of harming nature. Putting banners and boards indicating the relevance of plantation and protection of trees and nature. Spread the importance of Energy Conservation. Promote the use of e-copies and e-documents. • Print on both sides of paper. Celebrate tree plantations and plant trees on days of celebrations Promote the usage of LED bulbs • Discourage the use of plastics made pens/bags/files/folders etc. Moreover, our university administer the pledge by students and staff members to maintain green and clean campus and its surrounding areas on an annual basis. Waste Management To ensure greenery in campus and for conservation of natural resources, Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya has a waste management mechanism to achieve the following objectives: • To increase the green cover in and around the campus. To adopt methods for waste segregation · Take appropriate actions to reduce or recycle multiple waste inside the campus. · To manage, collect and dispose e-waste appropriately





- Actions taken to reduce consumption of plastic in the campus.
- To encourage paperless work culture and recycling/ reuse of paper.
- Display waste management instructions/alerts at prominent/relevant locations in the campus.

Green Audit

Eco-friendly campus is a concept implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment.

To achieve the green policy objectives, the university aims to regularly conduct a Green Environment Audit of its campus to assess our strengths and weaknesses to further our goals of long-term sustainability. Green audit means to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities achieve values of virtue.

Green audit of "Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya " enables to assess the life style, action and its impact on the environment. This green audit was mainly focused on greening indicators like utilization of green energy (solar energy) and optimum use of secondary energy sources (petrol and diesel) in the university campus, vegetation, and carbon foot print of the campus etc.







END OF THE REPORT THANKS