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ENVIRONMENTAL AUDIT

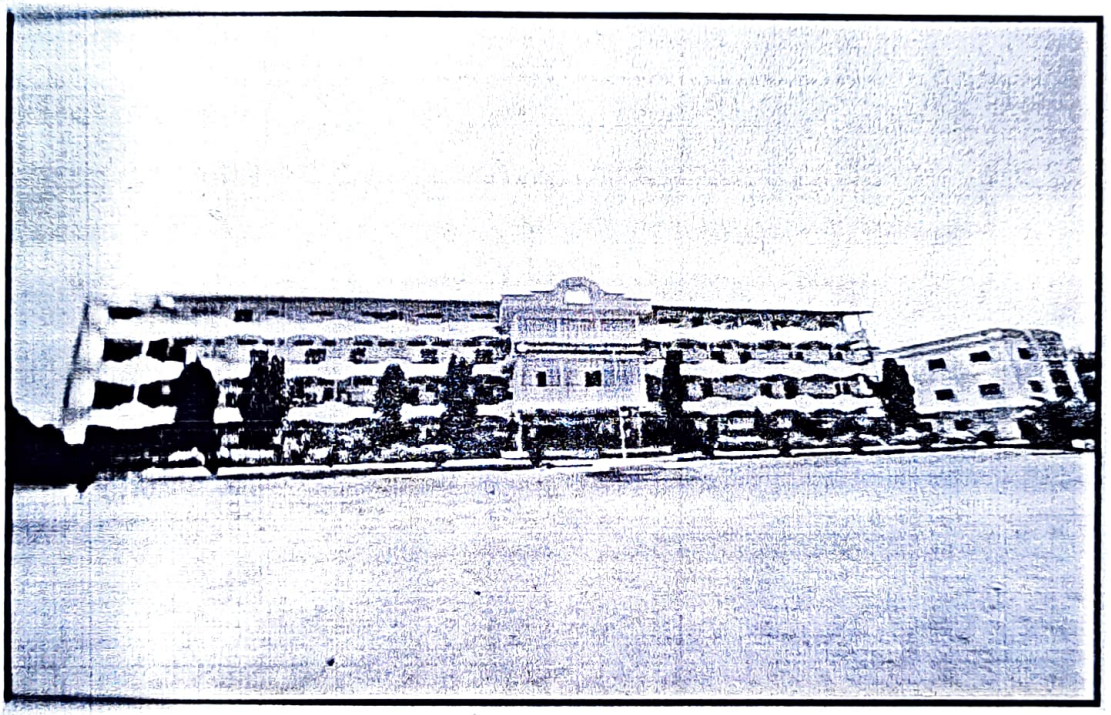
REPORT | 2020-2021

ENVIRONMENTAL AND CIVIL
ENGINEERING SOLUTIONS, SANGLI

www.envirocivilsolutions.com
envirocivilsolutions@gmail.com
+91 8329771588 +91 9665179531

HON SHRI ANNASAHEB DANGE ARTS, COMMERCE AND SCIENCE COLLEGE

HATKANANGALE



Environmental Audit Report

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Prepared by:

Environmental and Civil Engineering Solutions, Sangli

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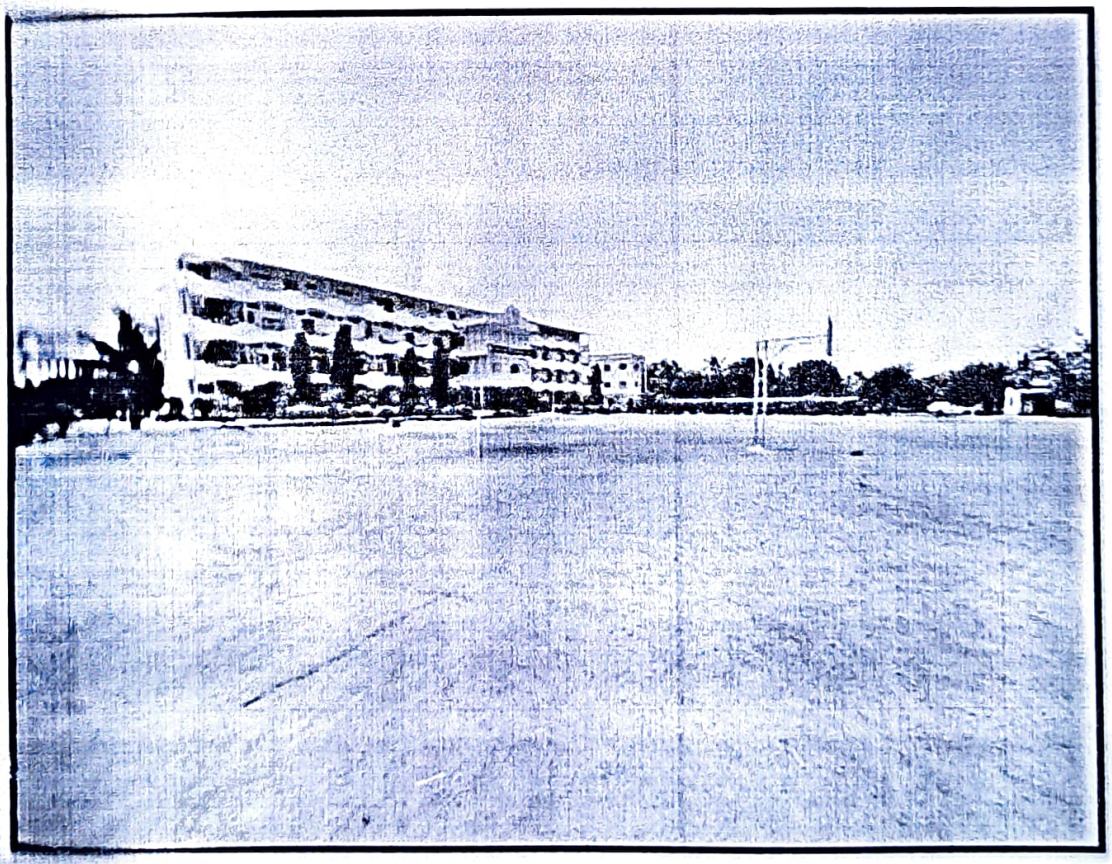
ACKNOWLEDGEMENT

ECS (Environmental and Civil Engineering Solutions) Team thanks the management of Hon. Shri Annasaheb Dange Arts, Commerce and Science College Hatkanangale for assigning this important work of Environmental Audit. We appreciate the co-operation to our team for completion of study.

Our special thanks are due to:

- Principal of the college – Mrs. Jungale
- Teaching & Supporting Staff of College



INTRODUCTION

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organisations of all kinds now recognise the importance of environmental matters and accept that their environmental performance will be scrutinised by a wide range of interested parties. Environmental auditing is used to

- Investigate
- Understand
- Identify

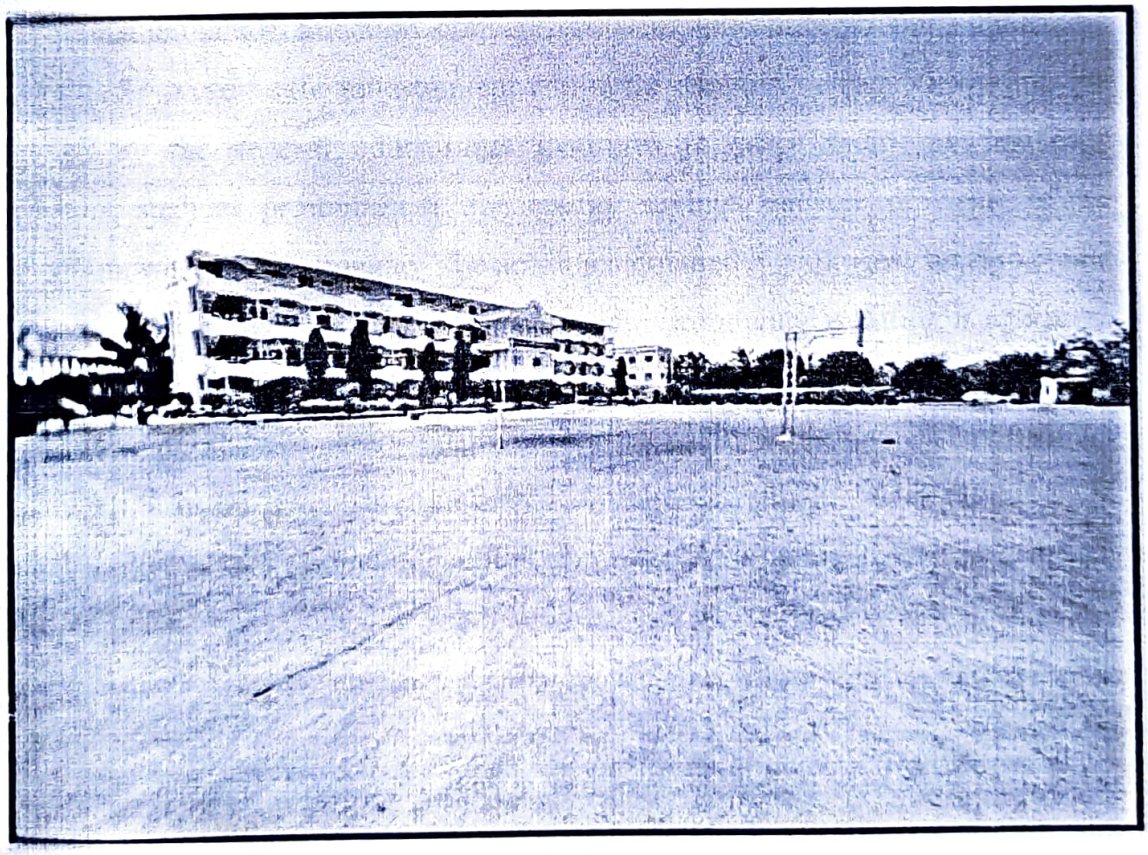


Figure 1 Campus

The term 'Environmental audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some Institutions believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Green Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

A Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. Educational institutions now a days are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. The activities pursued by colleges can also create a variety of adverse environmental impacts. Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives. Green audit is defined as an official examination of the effects a college has on the environment. As a part of such practice, internal environmental audit is conducted to evaluate the actual scenario at the campus,

OVERVIEW OF INSTITUTE

The Hon. Shri Annasaheb Dange Arts, Commerce and Science College Hatkanangale was established in the year of 1998. Institute has huge area of 2.5 hectors and has been serving the mankind in the field of arts, commerce and science. The college is situated in Hatkanangale city present in Kolhapur district. The landscaped grounds of college are widely admired for their beauty. In addition, there are cricket and football fields. The most valuable investment any educational institution can make is "Nurturing Future Leaders". With the continuous rise in expectation of essential leadership standards, the institute has torch bearers have taken a responsibility for this investment to nurture the NextGen leaders with a vision to bridge the existing skill gap. With a firm step forward to attain an academic excellence, several Centres of Excellence, computer labs, and industry-academia associations have been setup at the College in association with the top leaders. The College believes that its primary stakeholders are the students. All aspects of education focus on the core values of contributing to national development while fostering global competencies among students. The College admits students from all social milieus and empowers them through intensive mentoring and counselling to face the challenges of life and become responsible and sensitized citizens of the country.

The Dange College imparts education in various fields. Following are the departments:

1. Department of Marathi
2. Department of Hindi
3. Department of English
4. Department of History
5. Department of Geography
6. Department of Economics

7. Department of Commerce
8. Department of Physics
9. Department of Chemistry
10. Department of Botany
11. Department of Zoology
12. Department of Mathematics
13. Department of Computer science

Courses offered:

1. Bachelors of Arts
2. Bachelors of Commerce
3. Bachelors of Computer Application
4. Masters in Commerce
5. Masters in Arts

OBJECTIVE AND SCOPE

The broad aims/benefits of the eco-auditing system would be:

- Environmental education through systematic environmental management approach.
- Improving environmental standards.
- Benchmarking for environmental protection initiatives.
- Sustainable use of natural resource in the campus.
- Financial savings through a reduction in resource use.
- Curriculum enrichment through practical experience.
- Development of ownership, personal and social responsibility for the College campus and its environment.
- Enhancement of College profile.
- Developing an environmental ethic and value systems in young people.

WATER AUDIT

INTRODUCTION

Water audit for the "Dange College" was carried out. The purpose of the water audit is to provide a thorough understanding of the water uses by identifying and measuring all water using fixtures, appliances, and practices in order to recommend potential water saving efficiencies.

PRIMARY DATA

Sr. No.	Title	Information
1	**Name of building**	Dange College
2	**Address**	Hatkanangale 416109
4	**Name of company under which water audit is carried out**	Environmental and Civil Engineering Solutions, Sangli
6	**Number of floors**	G + 2 (Variable)
7	**Category of building**	Educational Institute
8	**Nearest ESR location**	Water Tank Area
9	**Water supply hours**	6:00 am to 10.00 am daily
10	**Water meter present**	No

POPULATION DETAILS

Title	Information
Fixed population (Working staff and Students)	Gents: 62 + 334 = 396
	Ladies: 23 + 186 = 209
Variable population (Visiting persons)	Gents: 11
	Ladies: 9

SOURCE INFORMATION

Title	Information
Sources of water	Municipal corporation water and Bore well
Connection details	1.5" PVC pipe inlet and 1" outlet distribution

STORAGE DETAILS

Title	Information
Overhead tank type	PVC tank
Location	On terrace
Number of tanks	**Hostel Section:** PVC: 2000 X 1 tank **Junior College:** PVC: 2000 X 2 tanks **Library building:** PVC: 2000 X 1 tank **Canteen:** PVC: 500 X 1 tank **Main Building:** PVC: 1000 X 3 tanks
Motor connection details	1.0 hp
Pumping period	1.5 hour daily
Underground sump	NA
Capacity of underground sump	NA

WATER USAGE FOR FLUSHING

Toilet	Number of users	Water consumption
Gents toilet	600 users	600 X 12 lit = 7200
Washbasin	918 users	918 X 0.75 lit = 689
Ladies toilet	318 users	318 X 15 lit = 4770
Toilet cleaning	350 liters	350 liters
Floor cleaning	120 liters	120 liters
Gardening	500 liters	500 liters
Total		**13,629 lit**

WATER USED FOR DRINKING

Since there is ample amount of fresh water supply still most of the staff carry their own water bottle. RO is present and visitors mostly drink this RO water. There are RO cans present in the office section too.

CONCLUSION

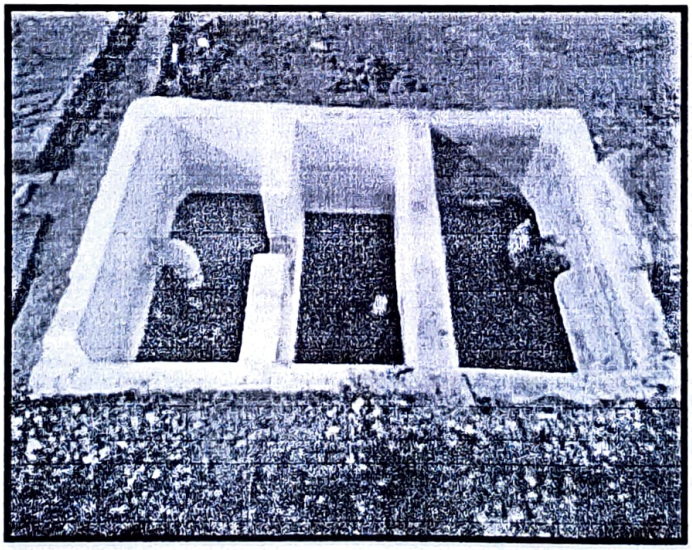
1. There is no water meter, hence water meter should be installed so that water usage monitoring could take place.
2. There is municipal water connection and this water is used for RO only. As per the survey the municipal water is not sufficient. Hence bore well water is used for flushing purposes.
3. Rain water harvesting pipes are present but the outlets are not connected to any sump or bore well. Connecting this outlets to bore well could help ground water recharge and improve quality of bore well water.
4. The permeate water of RO is let of in wash basin. This water can be stored and used for gardening purpose.

WASTEWATER AUDIT

The campus generates huge amount of wastewater. The source for wastewater in the campus are girl's hostel and the washrooms and urinals inside the campus. To estimate the amount of wastewater generated all the water that is used in the washrooms, hostels is considered as wastewater. Table shows the amount of wastewater generated:

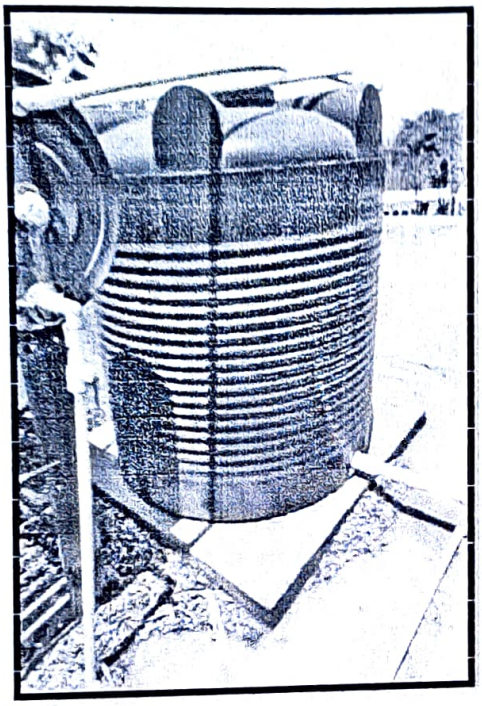
Sr. No.	Section	Count of people	Per Capita	Conversion factor	Amount of wastewater generated
1	Admin Section	600	50	80 %	24,000
2	Hostel Section	70	135	80 %	7,560
3	Canteen	50	20	80 %	800
Total					**32,360**

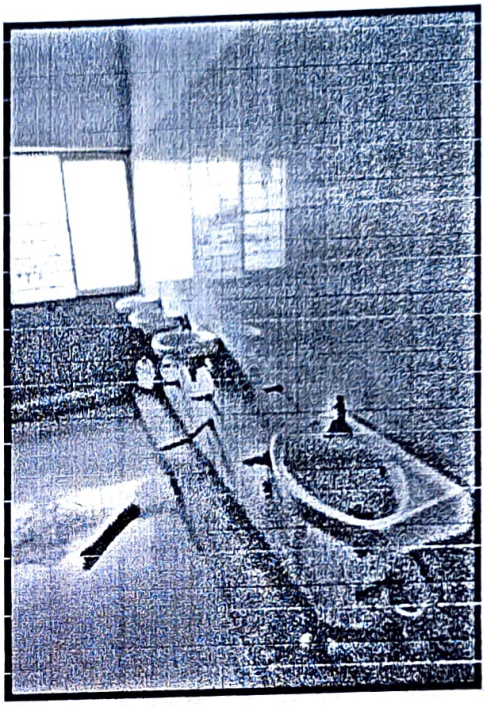
Hence the institute generates about 32,000 liters of wastewater approximately. This wastewater is treated in its own small baffled STP. Institute has taken excellent steps towards the wastewater treatment and this treated water is reused for gardening purpose.

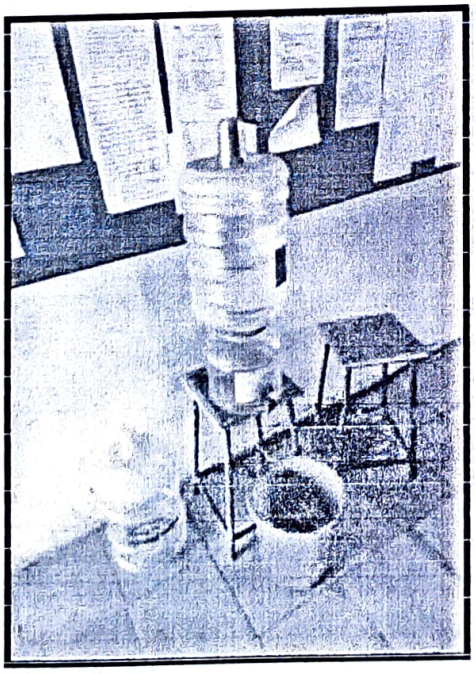


There are a couple of septic tanks which treat waste water too. One of them is present at back side on admin building. A septic tank does not cost more and has good efficiency. Septic tank uses the natural method of waste decomposition and thus is good for the environment. It has a long life span and lasts for several years. Septic tanks are relatively affordable and economical.

IMAGE GALLERY







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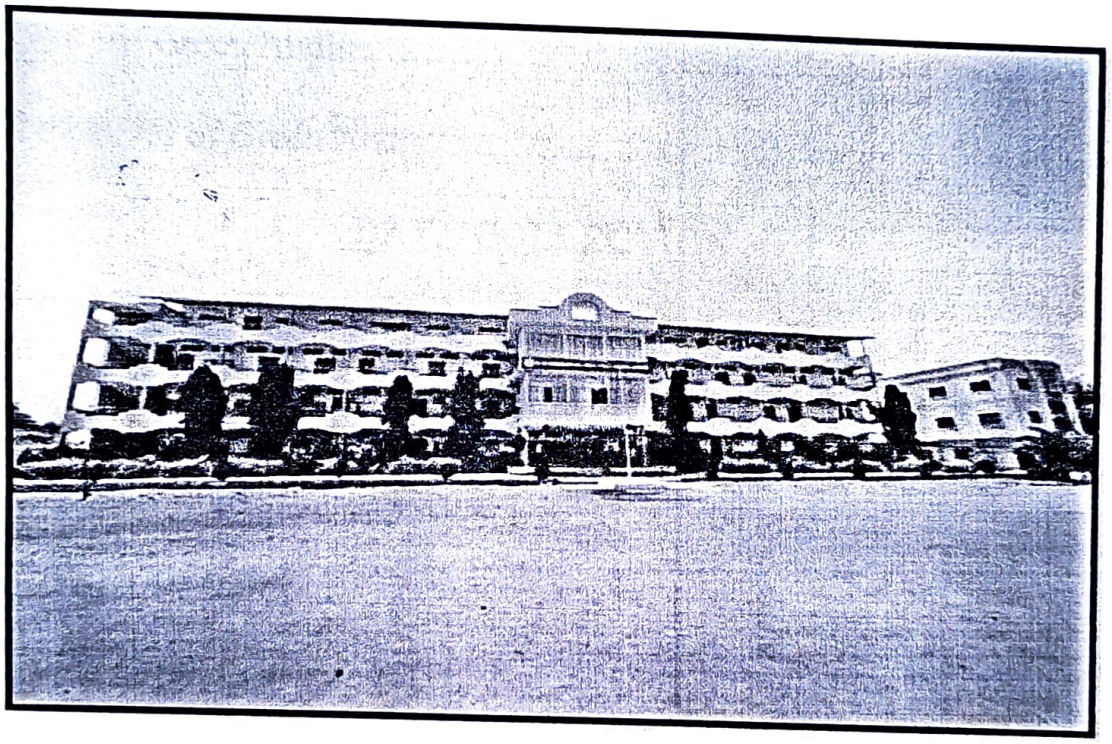

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INTRODUCTION

DATA COLLECTION

INTRODUCTION

he green audit aims to analyse environmental practices within and outside the iversity campuses, which will have an impact on the eco-friendly atmosphere. reen audit can be defined as systematic identification, quantification, recording, porting and analysis of components of university environment. It was initiated ith the motive of inspecting the effort within the institutions whose exercises n cause threat to the health of inhabitants and the environment. Through the een audit, a direction as how to improve the structure of environment and there e include several factors that have determined the growth of carried out the een audit.

eed of Green Audit:

reen auditing is the process of identifying and determining whether institutions actices are eco-friendly and sustainable. Traditionally, we are good and fficient users of natural resources. But over the period of time excess use of sour es like energy, water, are become habitual for everyone especially, in mmon areas. Now, it is necessary to check whether our processes are nsuming more than required resources? Whether we are handling resources refully? Green audit regulates all such practices and gives an efficient way of tural resource utilization. In the era of climate change and resource depletion it necessary to verify the processes and convert it in to green and clean one. Green dit provides an approach for it. It also increases overall consciousness among e people working in institution towards an environment.

oals of Green Audit:

- Identification and documentation of green practices followed by university.
- Identify strength and weakness in green practices.
- Analyse and suggest solution for problems identified.

Assess facility of different types of waste management.

ncrease environmental awareness throughout campus

dentify and assess environmental risk.

Motivates staff for optimized sustainable use of available resources.

The long-term goal of the environmental audit program is to collect baseline a of environmental parameters and resolve environmental issue before they come problem.

jectives of Green Audit:

To examine the current practices, which can impact on environment such as of ource utilization, waste management etc.

To identify and analyse significant environmental issues.

Setup goal, vision, and mission for Green practices in campus.

Establish and implement Environment Management in various departments. 5. ntinuous assessment for betterment in performance in green.

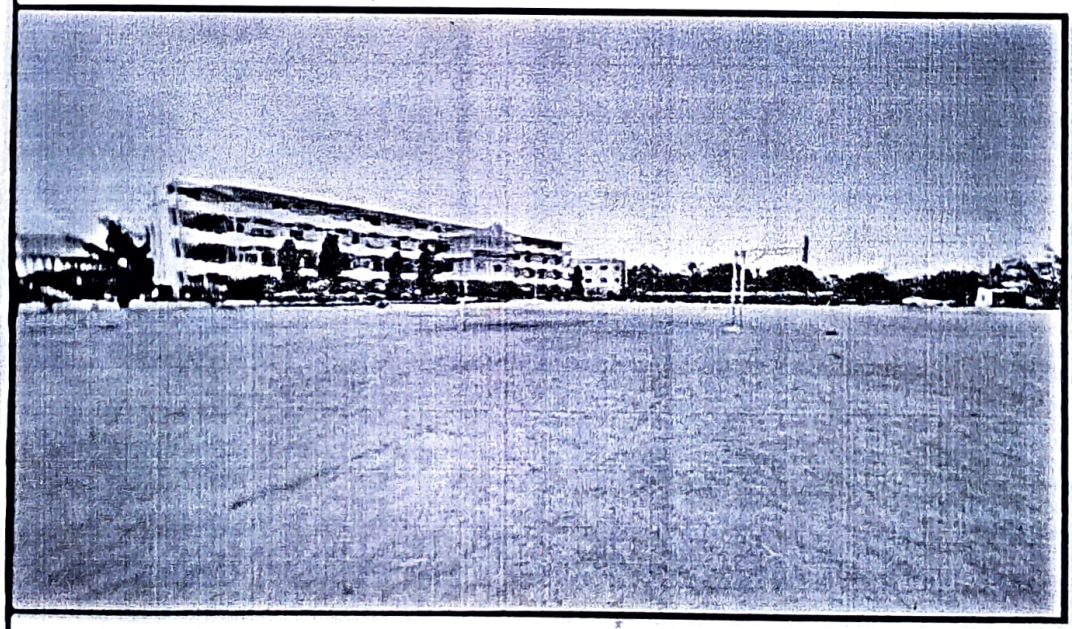


Figure 1 Campus

RO SYSTEM

rse osmosis removes contaminants from unfiltered water, or feed water, n pressure forces it through a semipermeable membrane. Water flows from nore concentrated side (more contaminants) of the RO membrane to the less entrated side (fewer contaminants) to provide clean drinking water. The fresh r produced is called the permeate. The concentrated water left over is called waste or brine.

tute has two RO systems present in the main building. They are installed g with water cooler. The second and third floor has the setup of RO system. water is used by the students for drinking purpose.

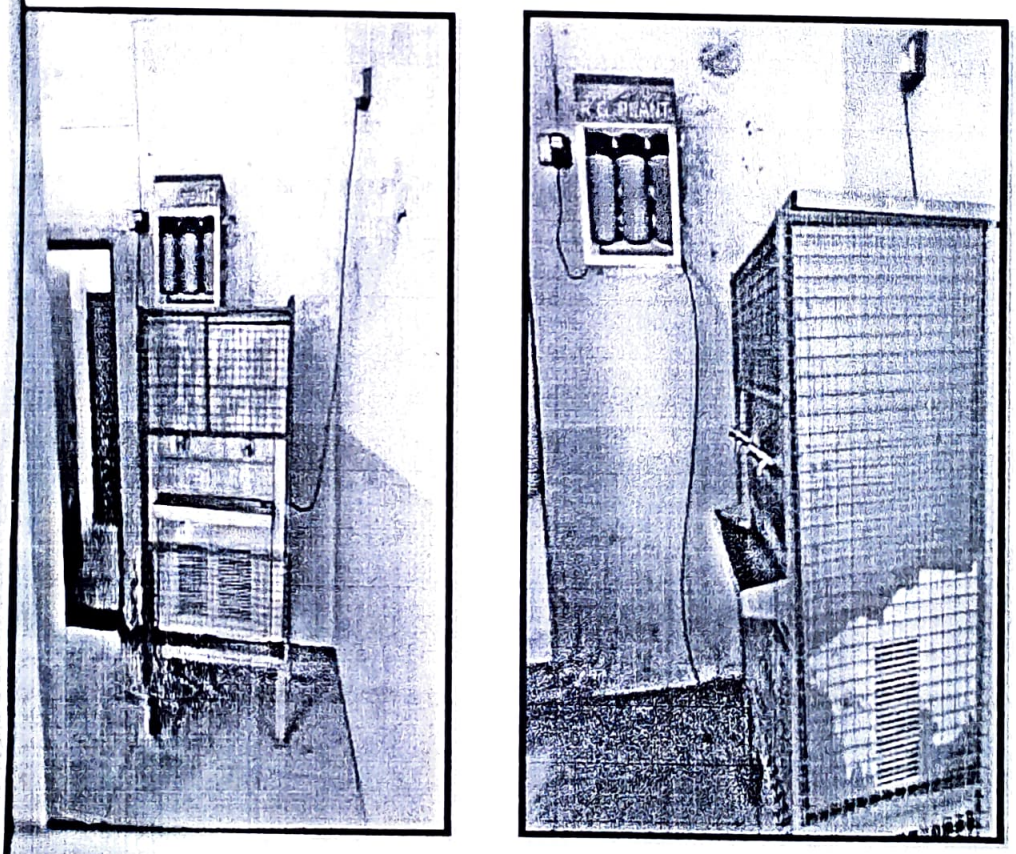


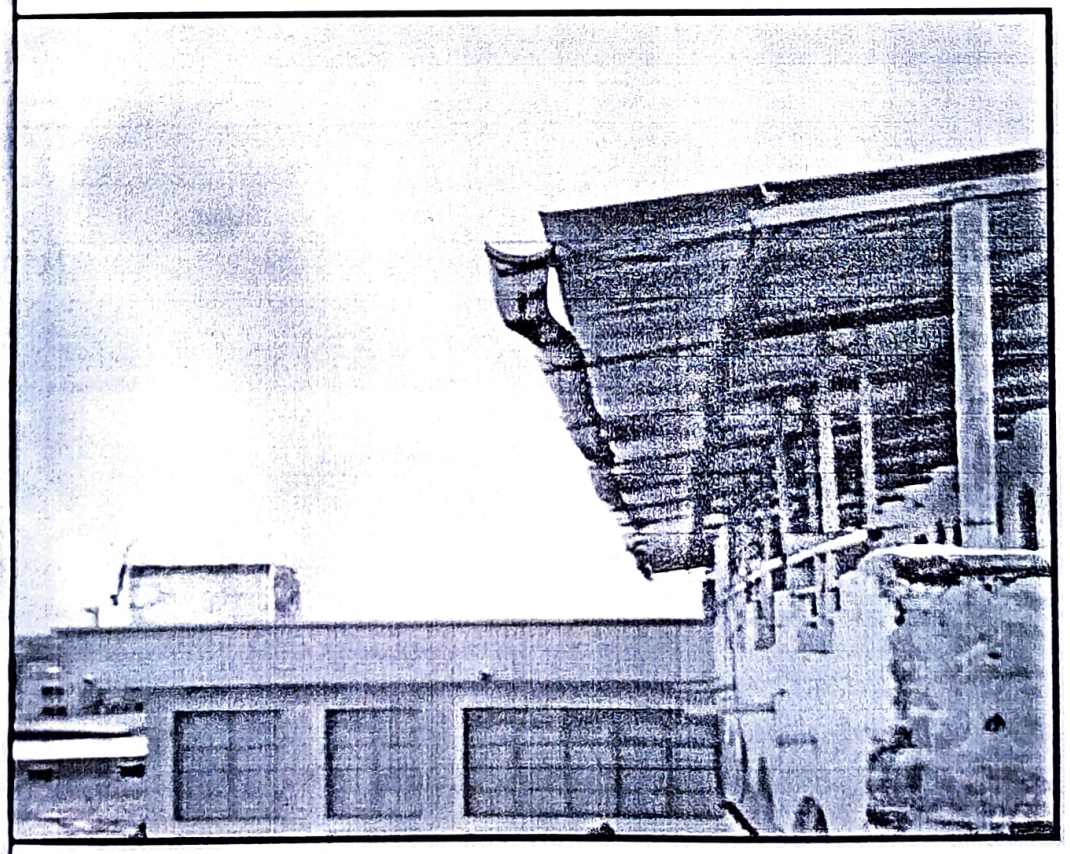
Figure 2 RO System with Cooler

ommon things observed regarding the reject of RO water is that it is led off he drains. This water can be reused for many purposes such as gardening ven in ground water recharge. This water can be stored in underground sump an be circulated for flushing purposes.

RAIN WATER HARVESTING

water harvesting (RWH) is the collection and storage of rain, rather than ving it to run off. Rainwater is collected from a roof-like surface and ected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a voir with percolation, so that it seeps down and restores the ground water.

water harvesting is one of the importing steps towers sustainability. Institute provisions of rain water harvesting. There are provision of gutters to the roof heets at the main building.



problems observed regarding the rain water harvesting is that the gutters t connected to any source of water. The gutters are open so all the rain water off. Even the outlet pipes of each floor are open. All the water falls on the d. Suggestion regarding connecting the outlets with a pipe network and off the collected rain water into an underground sump or connecting to one bore well present in the campus can prove beneficial.

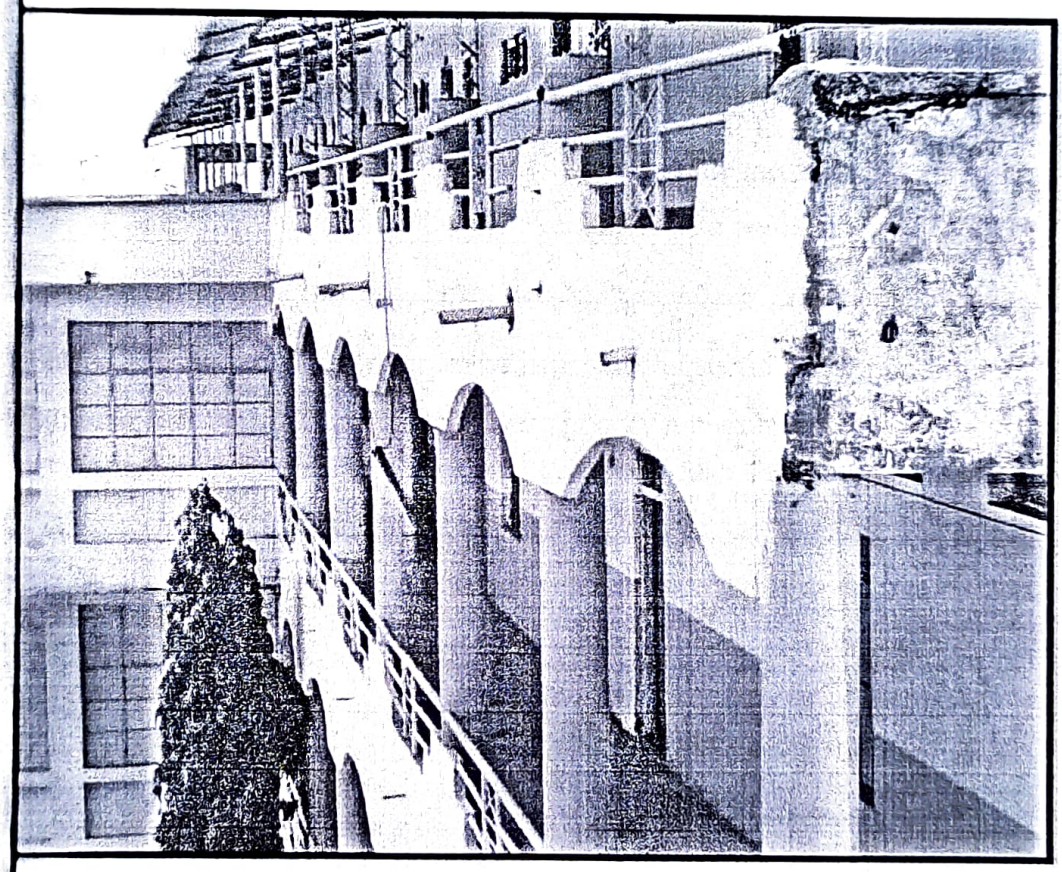


Figure 3 Outlet pipes are open

)OFTOP SOLAR HEATING SYSTEM

ır cell panel, solar electric panel, photo-voltaic (PV) module or solar panel assembly of photo-voltaic cells mounted in a framework for installation. panels use sunlight as a source of energy to generate direct current icity. A collection of PV modules is called a PV panel, and a system of PV s is called an array. Arrays of a photovoltaic system supply solar electricity ctrical equipment. Solar water heaters use natural sun light to heat water. system works on the thermosiphon principle and is designed to provide hot without consuming expensive electricity. This is the most effective way to ate hot water thereby saving costly power and is also environment friendly.

ute has three set of solar water heaters present on roofs of the ladies hostel. solar water provides hot water to the ladies hostel section. The condition of water heaters was good since they were goodly maintained.

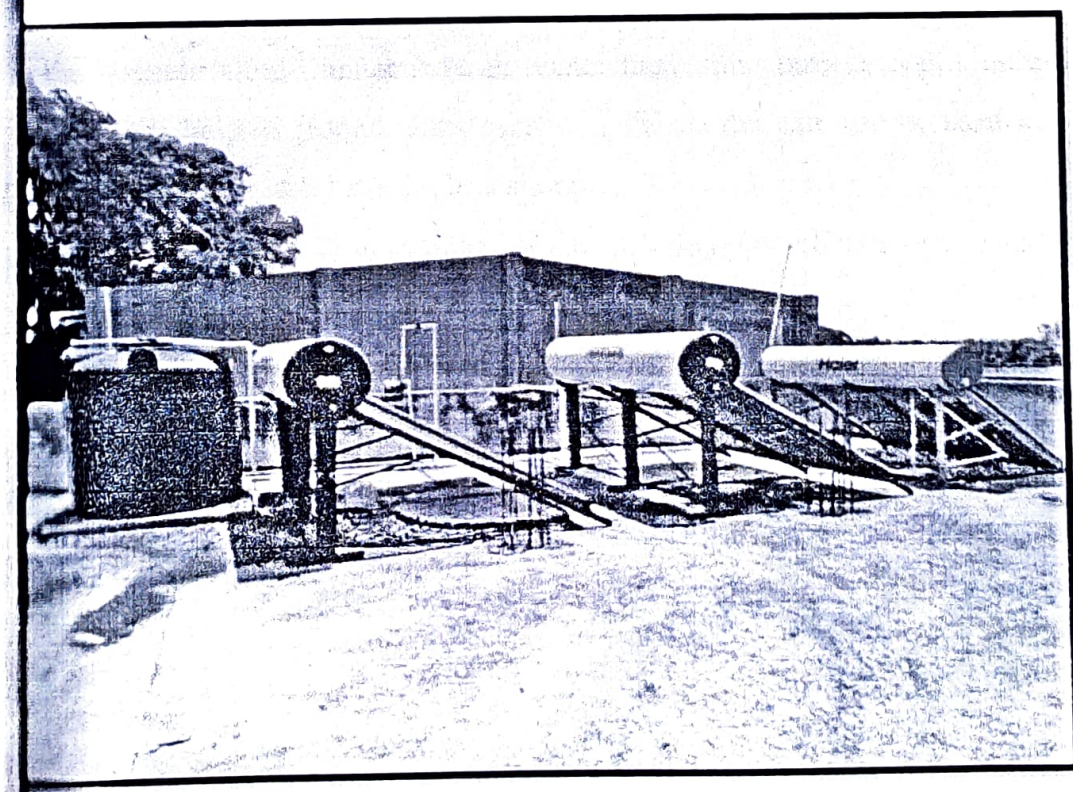


Figure 4 Roof top solar water heaters

CONCLUSIONS

g are the key observations during the audit:

e institute area has excellent green cover. There any garden spaces and ntations in sufficient amount.

ere is good ambience surrounding in the institute.

ggestions given regarding rain water harvesting needs to be followed. is can help to save huge amount of water and decrease load on bore lls.

e permeate or reject water from RO system can also be used in gardening flushing purpose. This will also help to reduce load of corporation water.

O system needs to be maintained in good condition. Regular cleaning of lters and changing of membranes could lead to excellent and safe water uality.

ain water harvesting needs to be done. There are 2 bore wells present in e institute area. Connecting rain water harvesting outlets to this bore ells can help in ground water recharge. This water can also be used in ardening purpose by storing in a slump.

nstitute has followed good techniques by developing agricultural land and garden which has improved the ambience.

IMAGE GALLERY