



**Environment Audit Report
Dyal Singh College Karnal-
Haryana , Year 2021-22**



**ENVIRONMENT AUDIT REPORT
CONSULTATION**



**Dyal Singh College
Karnal-132001, Haryana**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

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(2021-22)

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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore (M.P) takes this opportunity to appreciate & thank the management of **Dyal Singh College Karnal, Haryana** for allowing us to conduct an 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 during 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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Green Monitoring Committee



DYAL SINGH COLLEGE, KARNAL

NAAC Re-Accredited Grade 'A' and ISO 140001 & 9001 Certified
Website : dsckarnal.ac.in, e-mail: dsckarnal@gmail.com, Ph.: 0184-2252030/2251087

A committee of the following members has been constituted for the conduction of Energy, Green & Environmental Audit:

1. Sh Sanjay Kumar, Overall Incharge (NAAC)
2. Sh Sushil Kumar, Coordinator (NAAC)
3. Dr Devinder Singh
4. Dr Ritu Sharma (Eng.)
5. Dr Anita Agarwal
6. Dr Shweta Yadav
7. Dr Tejpal
8. Dr Aditi Shreeya Bali
9. Sh Kiran Kumar
10. Dr Omvir Singh, External Expert
11. Ms Meenu Sharma, External Expert

Committee shall submit audit reports to the undersigned. In addition to the above, Sh Azad Singh (Offg. Deputy Supdt.) and Parveen Kumar (Clerk) will be responsible to provide all the required details and documents to the committee as and when required.



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Audit Team

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

- ✦ **Mr. Rakesh Pathak,** [Director& Electrical Expert]
- ✦ **Mr. Rajesh Kumar Singadiya**[Director & Accredited Energy Auditor AEA-0284]
- ✦ **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]

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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.

Initiative for Environment Management Taken by College

+ RAINWATER HARVESTING SYSTEM

College has installed “Rainwater Harvesting System” in college campus for maintaining ground water level. This system harvest about 70 to 80 % of roof top rain water of the project building. **It’s Appreciable.**

+ DRIP WATER IRRIGATION SYSTEM

College has Used drip water irrigation system for trees and plant. **It’s Appreciable.**

+ USE EFFICIENT WATER TAPS.

College has used efficient water taps in washroom and toilets. **It’s Appreciable.**

+ WATER OVERFLOW SENSOR IN TANKS

College has used water overflow sensor in overhead tanks to avoid water overflow. **It’s Appreciable.**


ENVIRONMENT 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) in distribution network, for determine fresh water consumption per day in the college campus.

+ WASTE WATER TREATMENT PLANT

There is requirement to install Sewerage Treatment Plant (STP) for waste water generated from various activities where water is use in the campus. Waste water generated from various activity is collected in separate tank and it should be treated in propose STP Plant.


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✦ USE EFFICIENT URINAL TAPS

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

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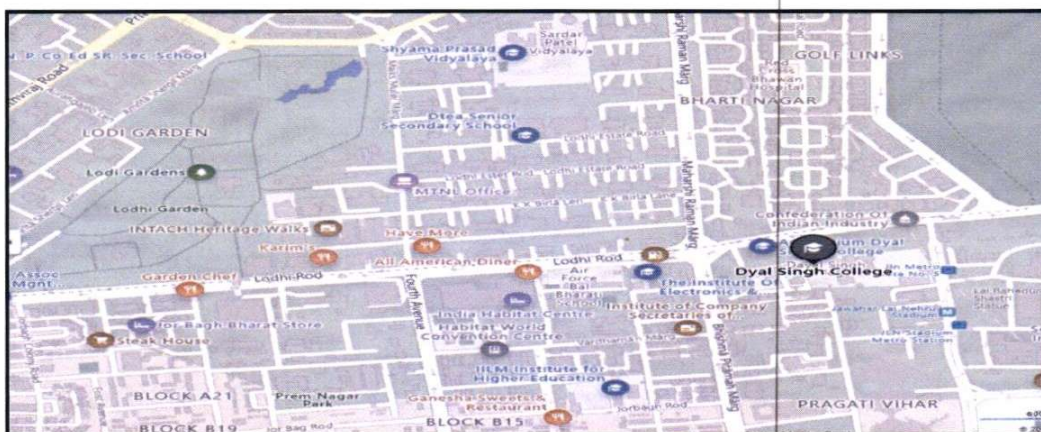
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CHAPTER-1 INTRODUCTION

1.1 About College

Dyal Singh College, Karnal, as it stands today, is a premier co-educational centre of learning of Northern India. With a strength of 3152 students, the college has all the three streams of learning – Arts, Science and Commerce, with Post Graduate courses in English, Hindi, Political Science, Commerce and Chemistry, along with the add-on and vocational courses. The college also offers a 5-year Integrated Course M.Sc. Forensic Science under innovative programme sponsored by the UGC. The college is making progress under the esteemed guidance of Shri D.K. Raina – an embodiment of rare wisdom, learning and love for academia-President, Dyal Singh College Governing Body, and the dynamic leadership of Vice Admiral (Retd.) Satish Soni, PVSM, AVSM, NM, a man of letters with administrative acumen, who holds the office of the General Secretary. This unique centre of teaching and learning completed hundred years and more than a decade of its birth and turned into a century-old Fortress of Learning and Education... maintaining the tradition of Spirituality and Scientific temper in a world of diminishing human values... inculcating in young minds, a harmonious blend of the “Wisdom of the East and West”. To quote our honourable Ex-President, Dewan Gajendra Kumar, “The lead word in our motto is Wisdom and Morality and Ethics are not far behind.” True to the Will of our Illustrious Founder, Late Sardar Dyal Singh Majithia, the path of Wisdom, Morality and Ethics has been the kindling force all along.



Source : Satellite Image of Dyal Singh College from Google map


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Vision

Excellence is a journey, not an end.....

Mission

1. To create top quality human resource by developing the innate talent of our students.
2. To provide conducive environment for holistic development of personality and improve the overall academic performance.
3. To inculcate the spirit of Secularism, Nationalism, Communal Harmony & Rationalism.
4. To inculcate discipline as a value system and motivate youth to render service to the society at large.

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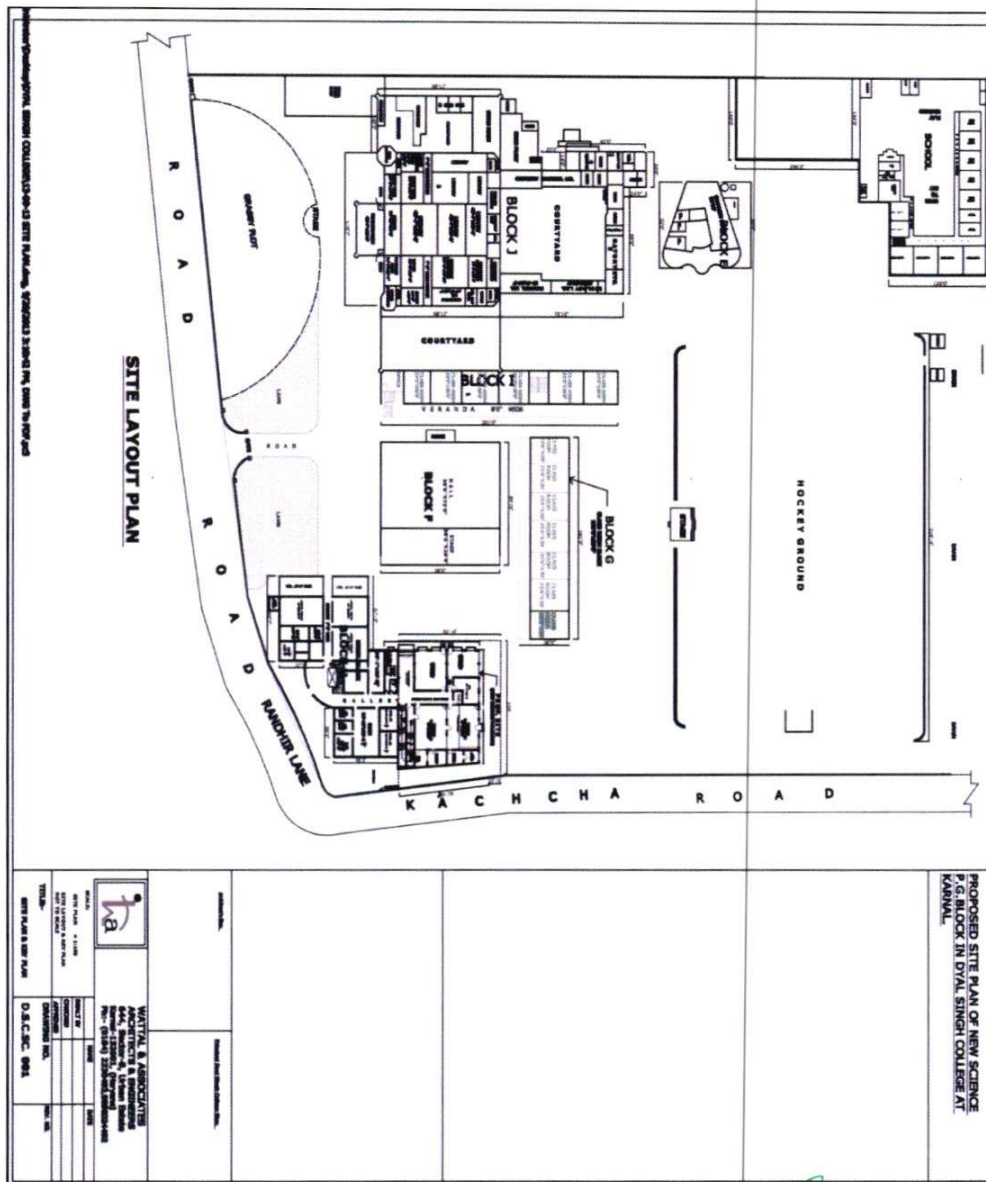


College Build-up Area

The total build-up area given in the table:-

Campus area in sq. mts.	32374.85
Built up area in sq. mts.	13310.53

Layout of college campus



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1.2 About Environment Auditing

Water audits can be a highly valuable tool for institute in a wide range of ways to improve their energy, environment and economic performance. While reducing wastages and operating costs. Water 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.

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1.5 Methodology followed for conducting Environment audit

Step 1: Walk through survey

- ✦ 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


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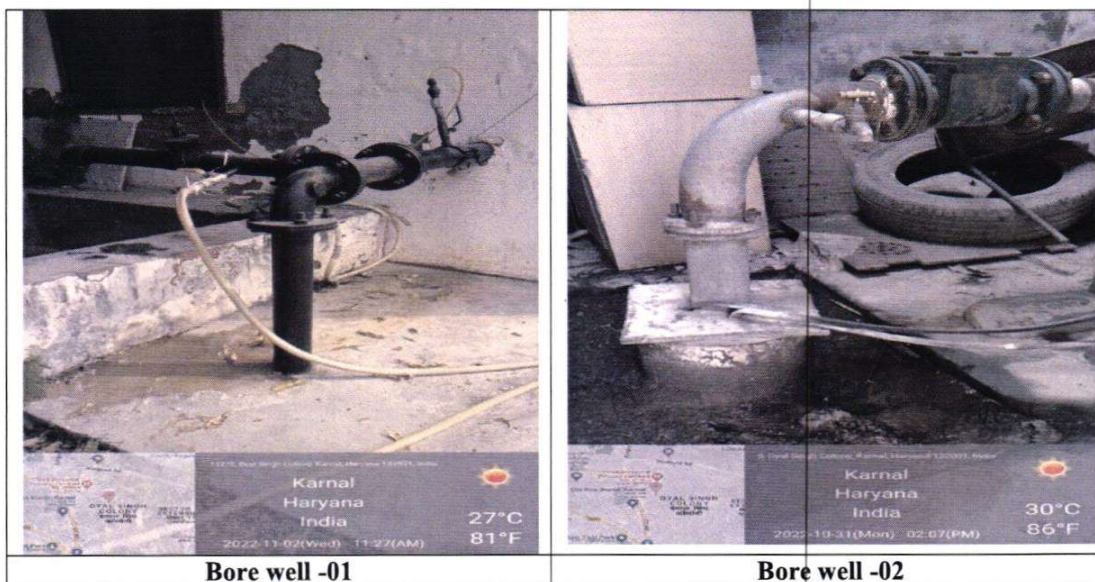
**CHAPTER- 2
WATER CONSUMPTION AND WASTE WATER SOURCES**

2.1 Details of Source of Fresh Water and Use Areas:

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

Table: 2.1 Details of Fresh water sources

Sr.No.	Location	Capacity (HP)	Phase	Running Hour
1	Bore well -1 Near School ground	20	3	6-8 hour
2	Bore well -2 Near College ground	20	3	6- 8 hour



2.2 Bore well Power Measurement

Sr. No.	Fresh Water Sources	Location	Motor Power (HP)	Voltage	Current	Working (Hr./day)
1	Bore well -01	In School Ground	20	416	22.6	6 to 7 Hours
2	Bore well -02	In College Ground	20	414	23.7	6 to 8 Hours

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2.3 Water Accounting & Metering System

It was observed that there is requirement of water flow meters on bore wells to quantify ground water extraction per day.



Observation;-

Water Audit team observed that there are required water meter on bore wells. So it is recommended to install water meter on bore wells to quantify of fresh water consumption per day.


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2.4 Water Storage Capacity in College Campus

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

Table2.4: - Water storage tank in college campus

Sr. No.	Location	No. of Tank	Tank Capacity	Material
1	Science Building	1	40,000 Ltr	RCC
2	Canteen	1	20,000 Ltr.	RCC
3	Staff Colony	1	15,000 Ltr.	RCC
4	Common Room	1	10,000 Ltr.	RCC
5	Commerce Block	1	10,000 Ltr.	RCC
6	Girls Common room	7	7 X 750 Ltr.	Syntax
7	Guest Room	1	750 Ltr	Syntax
8	Admin Block	1	750 Ltr	Syntax
9	Arts Block	1	1000 Litre.	Syntax
10	New Building	1	1000 Litre.	Syntax

Photographs of water storage tanks.

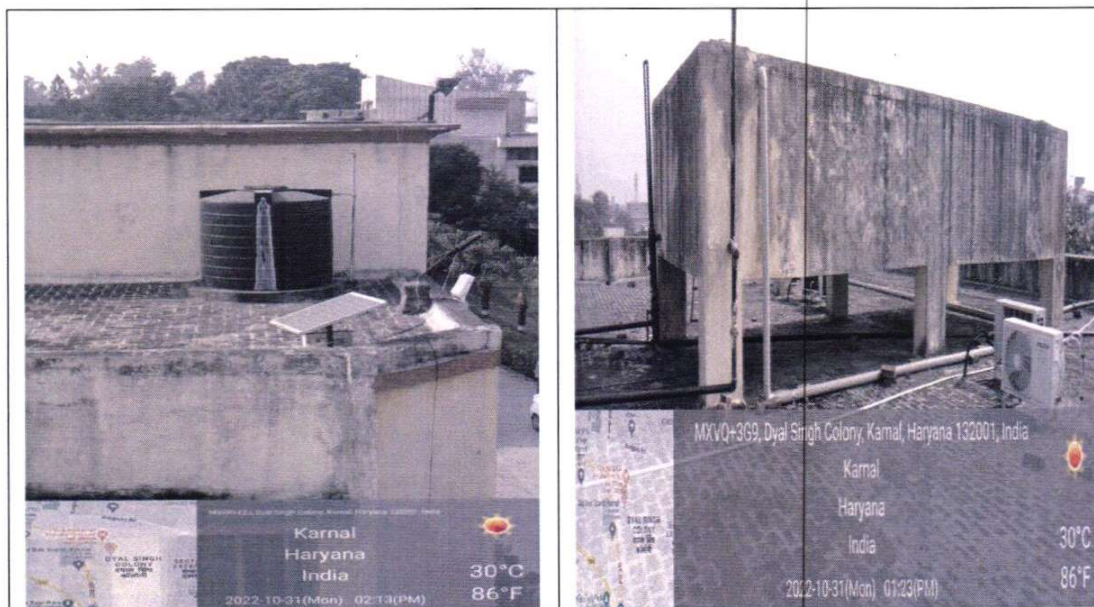



Fig: - 2.4 Water Storage Tank in college campus


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2.5 Fresh Water distribution layout of college

Audit team study the water sources and prepared water distribution flow diagram in college campus.

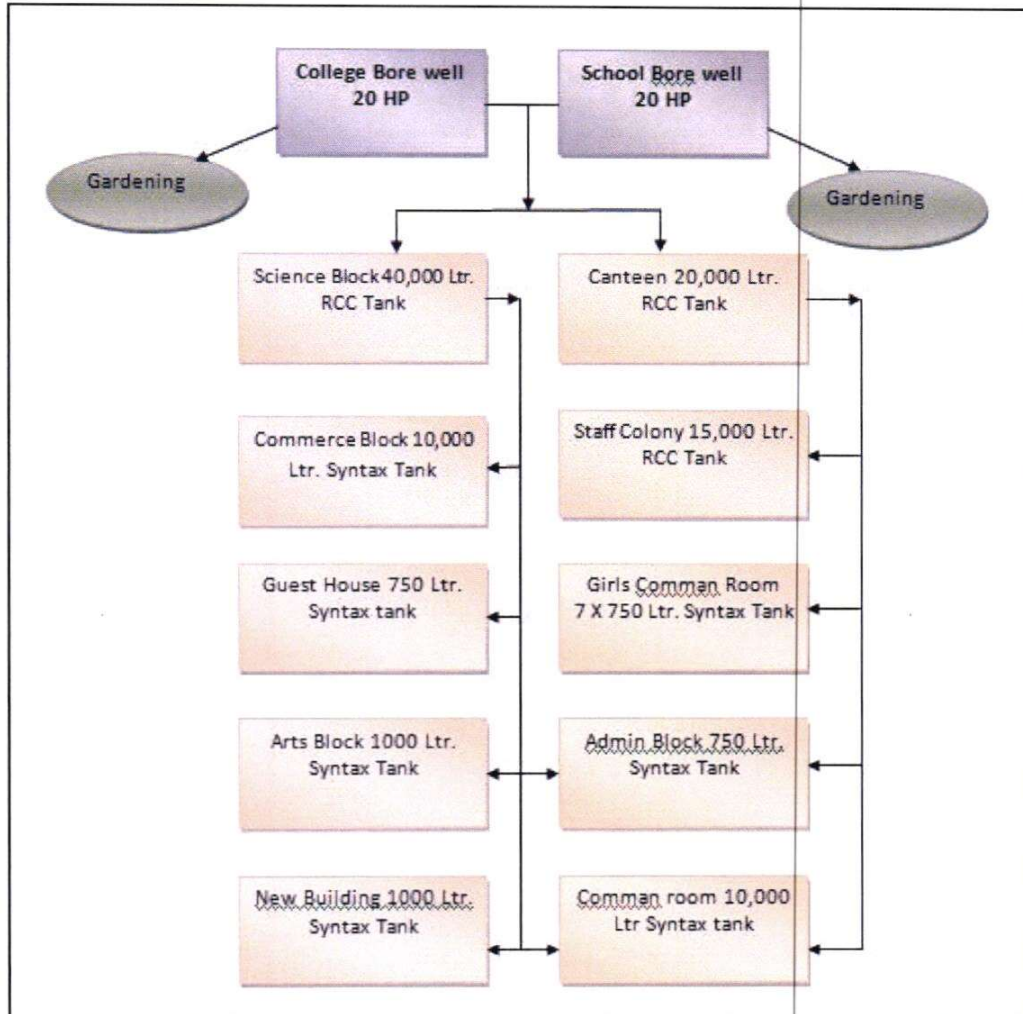


Fig: - 2.5 Layout of college Water distribution


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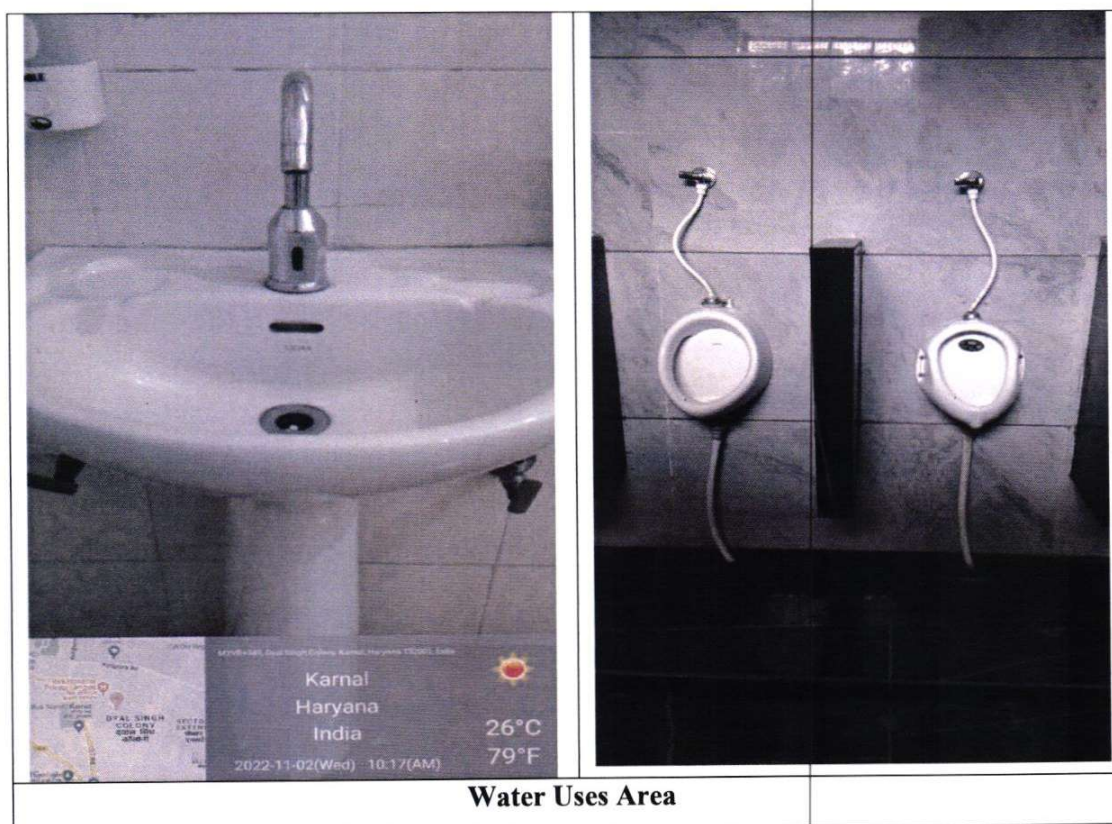


2.6 Water use areas in college campus

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


Table: 2.6 Details of washroom and uses taps in various areas

Sr. No.	Location	Urinals	Taps	Toilets	Hand wash
1	In All College	46	96	48	44



Observation:-

- ✚ There is requirement to install Sewerage Treatment Plant (STP) for waste water generated from daily activities in the campus. All waste water generated from drinking, washing etc. activity is collected in separate tank and it should be treated in propose STP Plant


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2.7 Details of water cooler in college campus


Table: 2.7 Details of water cooler in college campus

Sr.No.	Location	No of Water Cooler
1	Main Gate	1
2	Girls Common Room	1
3	Canteen	1
4	Science Block	1
5	Staff room	1
6	Near Auditorium	1
7	Commerce Block	1
	Total	8



Observation:-

- ✚ It is observed that RO rejected water drain in to atmosphere. So it is recommended to collect all RO rejected water in separate tank and utilize to toilets and washroom purpose.


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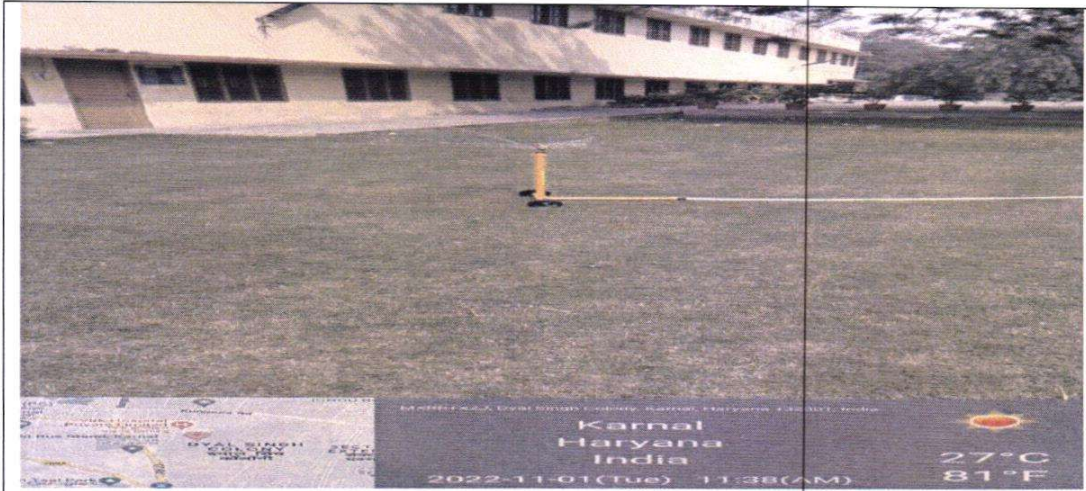


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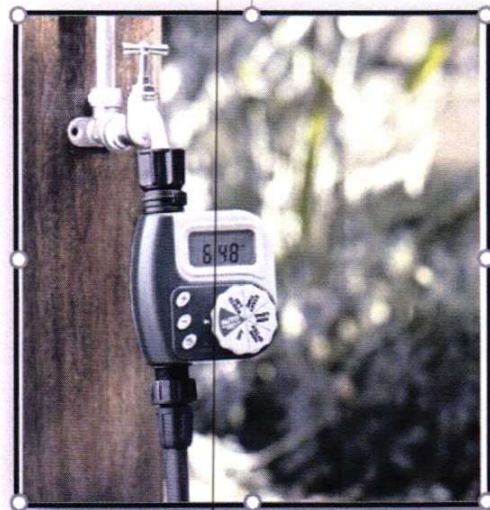
2.8 Fresh water uses for gardening:

College has install water sprinkler system for lawn area. **It's Appreciable**



Water uses for gardening by sprinkler system

The one of major contribution of fresh water consumption is watering for plants and gardening in college 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.



Proposed Adjustable Misting Nozzle Irrigation Drippers Proposed water timer

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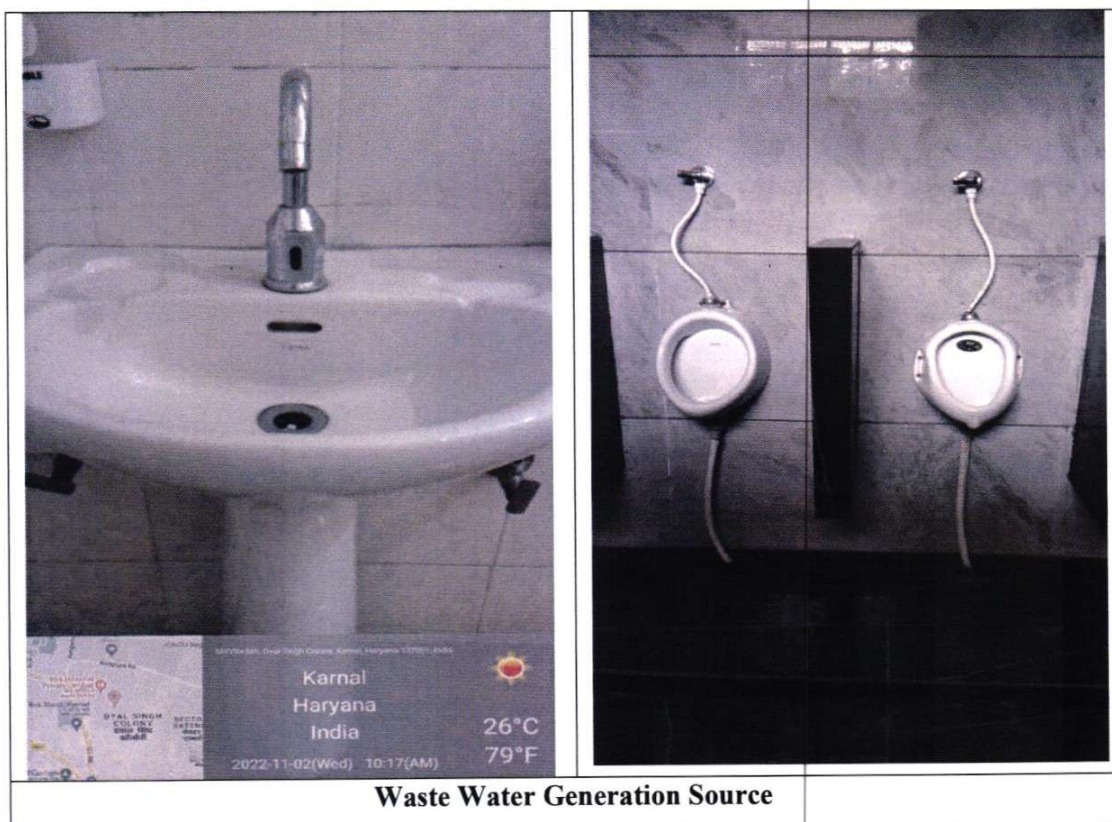


2.9 Waste Water Generation sources: -

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

Sr. No.	Location	Type of water used	Water Consuming activities
1	Admin Block	Fresh Water	Drinking and other uses
2	Arts Block	Fresh Water	Drinking and other uses
3	Auditorium	Fresh Water	Drinking and other uses
4	Science Building	Fresh Water	Drinking and other uses
5	Canteen	Fresh Water	Drinking, domestic and other activities
6	Ground + Other	Fresh Water	For Gardening Purpose

Some Photo Graphs of waste water generation source



Waste Water Generation Source


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2.10 Water Quality Test Report

Raw Water & Drinking Water Quality tested report:

KAY ESS WATER SOLUTIONS
49 Mugal Canal Karnal Phone No. 9468121125
GSTIN NO 06AUUPA5811B1ZZ

DATE - 3/11/2022

REPORT

TO
DYAL SINGH COL.
KARNAL

Checked RO water + Raw water
on 2/11/2022

RO water TDS - 100 PPM
Raw water TDS - 350 PPM
PH of RO water - 8

For KAY ESS WATER SOLUTIONS
Prop.

RO + Raw Water Test Report

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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.

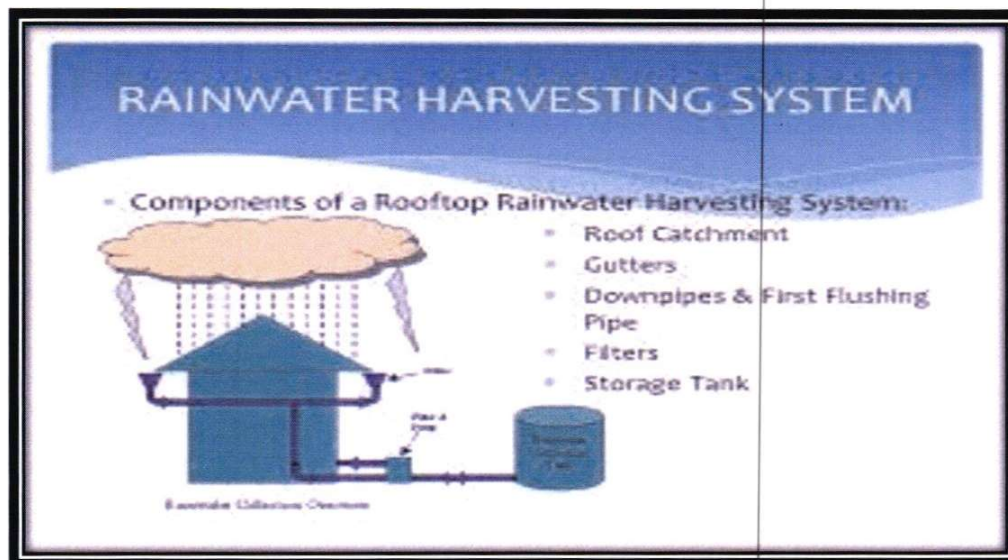


Figure: - 3.1 Components of a rooftop rainwater harvesting system

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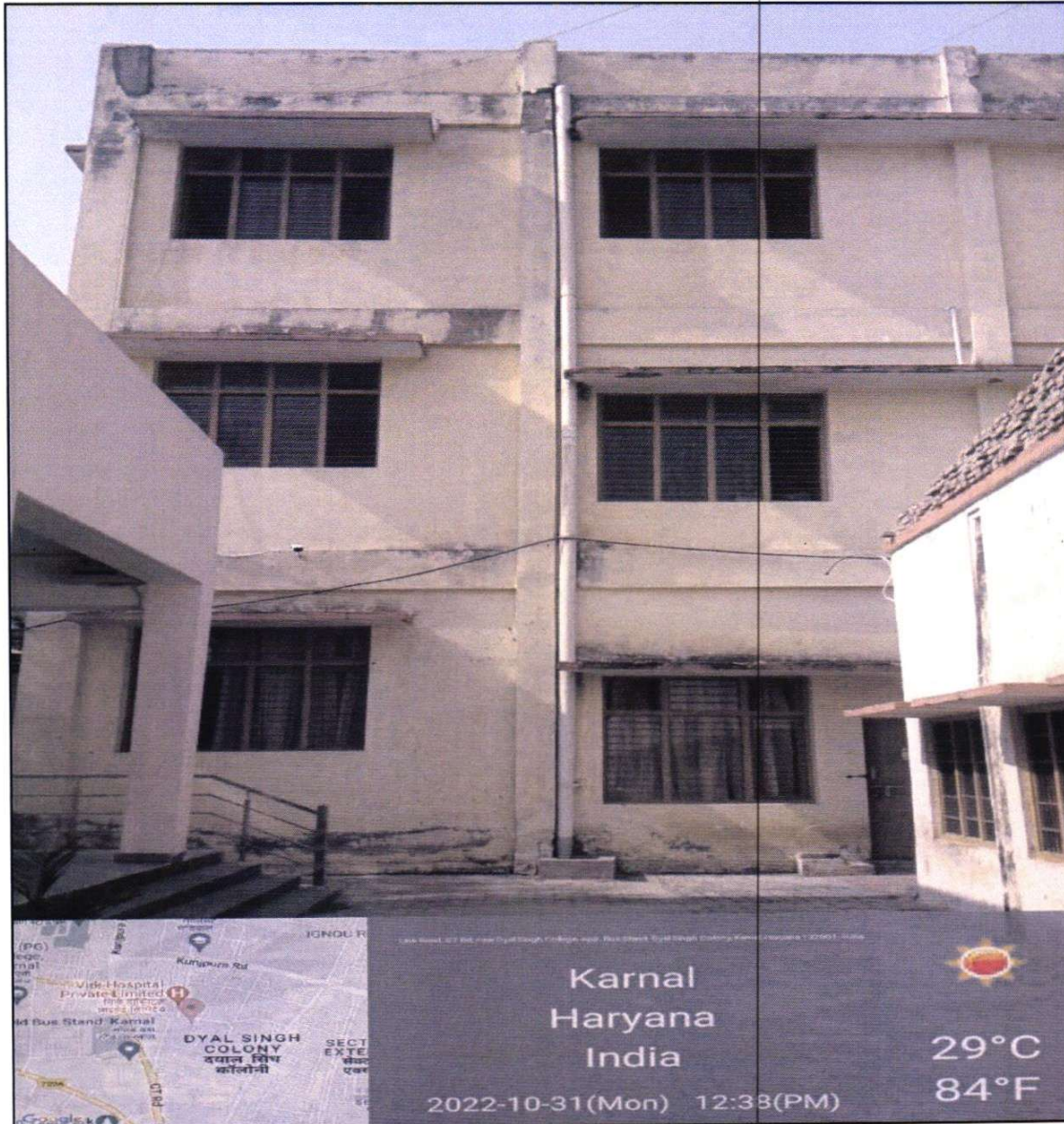


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3.2 Rain water Harvesting Potential of the College

Various types of Buildings like Admin Block, Arts Block, Science Block, Commerce Block, Canteen, Auditorium, Common Room etc. Rain Water harvesting Systems are installed. **It is Appreciable**

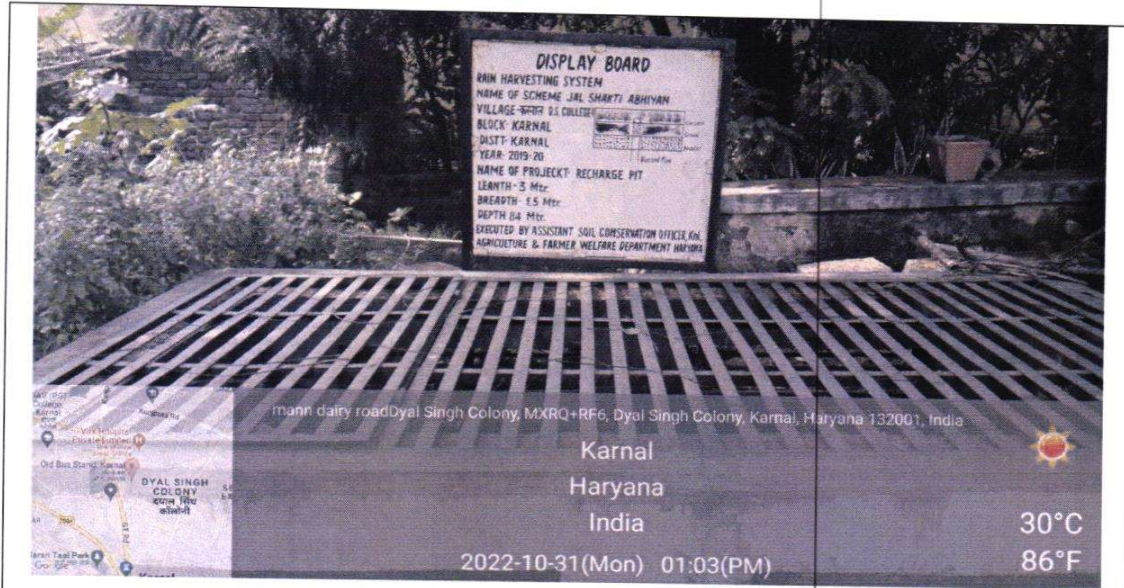


Rain Water Harvesting System



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Rain Water Storage Tank


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