



MUKAND LAL NATIONAL COLLEGE

(Affiliated to Kurukshetra University, Kurukshetra) Estd. 1955
YAMUNA NAGAR – 135 001 (Haryana)

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Criterion 7 – Institutional Values and Best Practices

7.1.3 Quality audits on environment and energy regularly undertaken by the Institution.

Report of the Environment Audit.

Principal

Mukand Lal National College,
YAMUNA NAGAR (Haryana)

Dr. Ritu Kumar

Principal (Offg.)



**Environment Audit Report
Mukand Lal National College
Yamuna Nagar , Haryana
2021-22**



**Environment Audit Report
CONSULTATION**



**Mukand Lal National College
Yamuna Nagar, Haryana
135001**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

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(Academic Year 2021-22)



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2021-22



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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of **Mukand Lal National College, Yamuna Nagar, Haryana** 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.

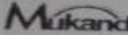
Rajesh Kumar Singadiya (Director)
M.Tech (Energy Management), Ph(Research Scholar)
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
(BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal
M.P. Lead Auditor ISO 50001:2011 [EnMS] from FICCI,
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Chartered Engineer [M-1699118], The Institution of Engineers (India)
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Green Monitoring Committee


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Ref No. _____ Date _____

September 21, 2022

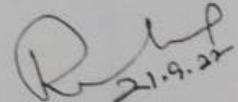
NOTICE

An Energy, Green and Environmental audit committee is formed in the college. It includes the following teachers:

1. Dr. Ritu Kumar *Ritu*
2. Dr. Rachna Aggarwal (IQAC incharge)
3. Mrs. Sunita Sikri *Sunita*
4. Dr. Rahul Singh *Rahul*
5. Dr. Rameshwar Groach
6. Sh. Gurmeet Singh

The following non-teaching staff is also deputed for helping to collect the data:

1. Sh. Ram Pratap
2. Sh. Ajay Kumar
3. Sh. Ajit Kumar
4. Sh. Asha Ram


(Dr. Rahul Khanna)
Offg. Principal



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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]

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 4 no's of "Rainwater harvesting system" in college campus for maintaining ground water level. This system saves about 70 to 80 % of roof top rain water of the building. **It's Appreciable.**

+ WASTE WATER MANAGEMENT:

- College has 100 KLD STP plant for waste water treatment. The waste water generated from PG block, admin block, commerce block, arts block, cafeteria, & various departments, of the college .It is collected in STP (Sewage Treatment Plant) and treated after treatment it is reused in gardening purpose. **Its Appreciable**

+ E-WASTE MANAGEMENT: -

- College has E-waste (tube light, printer, PC, etc) Management system for the final safe disposal of the E-waste through authorized vendor. **Its Appreciable**

AUDIT RECOMMENDATION

+ FRESH WATER MONITORING SYSTEM:

- Installation of "Cloud based (IoT) internet of things ground water extraction monitoring system" on bore well to quantify fresh water consumption per day
- Install water flow meters (Mechanical or Electronic) in distribution network, in various college buildings for quantifying per day water consumption and waste water generation in the college campus.



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✚ DRIP WATER IRRIGATION SYSTEM FOR PLANT AND TREES

- Use drip water irrigation system for plant and trees.

✚ 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.

✚ USE EFFICIENT URINAL TAPS: -

- Replacing inefficient fixtures with water sense labeled flushing urinal can save between 0.5 to 04 litre per flush without sacrificing performance. Installing 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: -

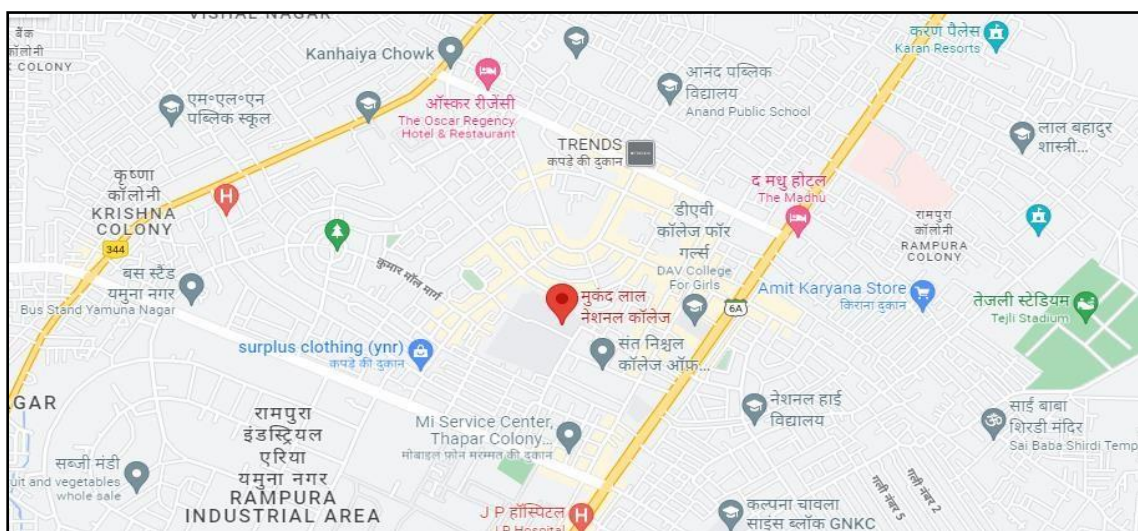
- It was observed that water overflow in overhead tanks after tank filling. So, it is recommended installation of water overflow sensor to avoid water overflow.

CHAPTER-1 INTRODUCTION



1.1 About College

Mukand Lal National College was established in 1955 by a great visionary and educationist Seth Jai Prakash Ji in the cherished memory of his illustrious father Seth Mukand Lal Ji, who was a renowned Gandhian and philanthropist. From the founder Principal Mr. R.N. Rihan, Prof. Tilak Raj Chadha took over the charge. He and his successors, Dr. B.K. Chanan, Dr. K.L. Johar ,Dr. Ramesh Kumar and Dr. Shailesh Kapoor with the able support and magnanimity of Chairman, Seth Ashok Kumar Ji coupled with unstinted support of faculty members have succeeded in carving a niche for the college as a premier institute of higher education in Northern India. The present incumbent, has taken the baton from his illustrious predecessors with the mission of carrying the College to still greater heights with the blessings and guidance of Sh. Ashok Kumar, Chairman, and day to day active support from Dr. Ramesh Kumar, General Secretary, College Managing Committee coupled with full support from the experienced and dedicated faculty. During the course of its long journey, the College has scaled towering heights in academics, sports, co-curricular activities and social service and its alumni has made a mark in different fields of public service and public life.

The college has been declared as College with Potential for Excellence (CPE) by the University Grants Commission of India, New Delhi.



Source : Satellite Image of MLN College from Google map

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Vision

To impart Quality Education through Time-tested Traditions blended with latest Innovations to transform Youth into Human Resource that is Responsive to Societal, Environmental and Cultural Responsibilities.

Mission

To build State-of-the-art Infrastructure, engage Dynamic and Dedicated Faculty and inculcate Scholarly Pursuits and Human Values in the Young Minds and imbibe them with Qualities, both of Head and Heart, so that they emerge as assets to National Pride and challenge to International benchmarks.

Objective

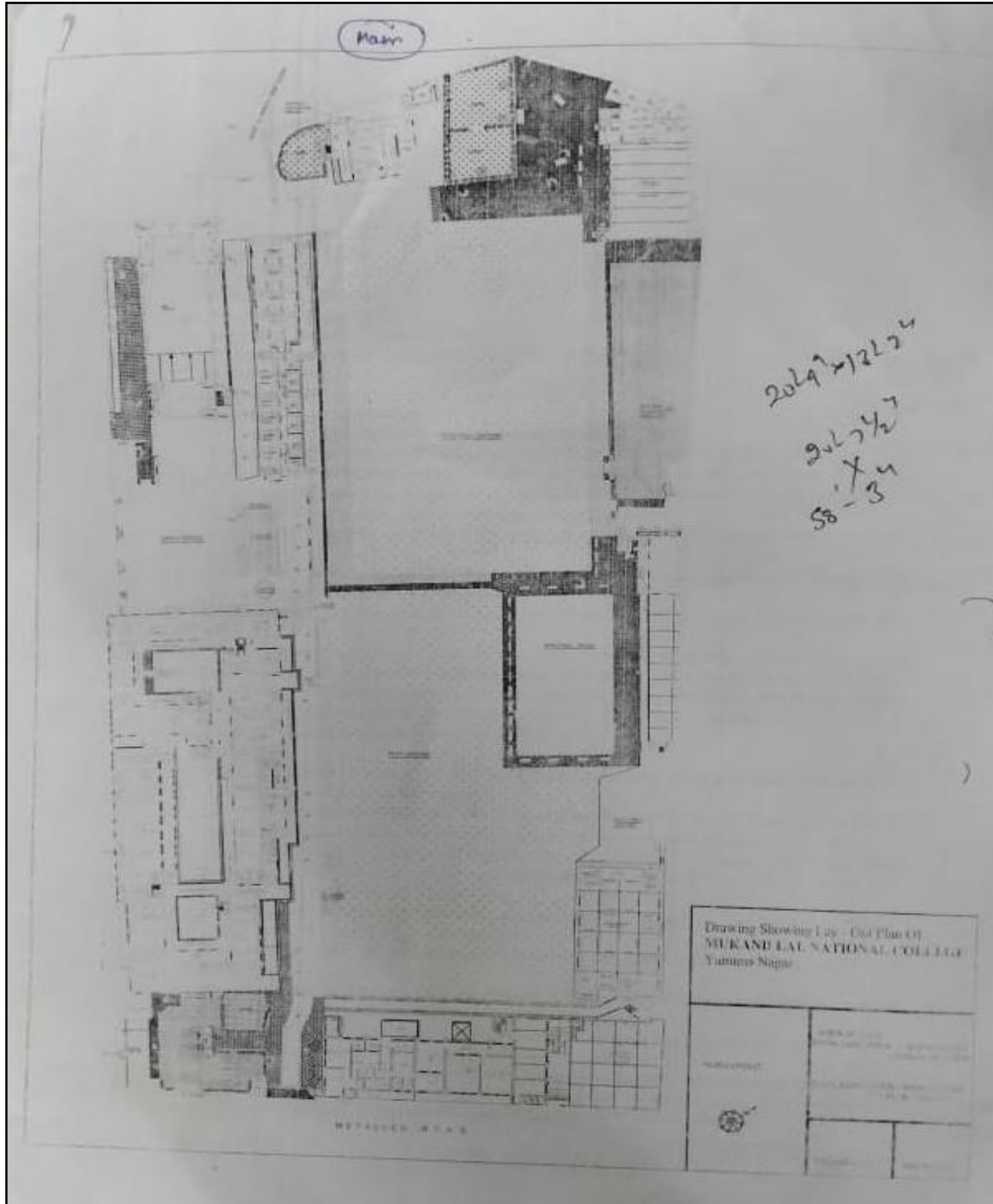
To remain committed to excellence in imparting Quality Education, promoting Research Culture, ensuring Transparent Governance and focusing on the dimensions of Studies, Sports, Stage and Social Service, for the Holistic Development of Student's Personality.

College Area

Details are the total build-up area given in the table:-

Total Covered area		33070.91 SQ. MT.	
Total Build Area		17215.52 SQ. MT.	
S.NO	BLOCK	BUILD UP AREA	
		GROUND FLOOR AREA IN SQ.MT	FIRST FLOOR AREA IN SQ.MT
1	Cafeteria	3873.35	NA
2	Commerce Block	3561.41	2976.63
3	Admin Block	1440.93	1389.15
4	Arts Block	353.15	NA
5	Gymnasium	755.64	567.73
6	Sub Station Room	171.96	NA
7	Stadium Block	504.51	524.88
8	PG Block	728.01	368.17

Layout of college campus



1.2 About Environment Auditing

Environment 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 environment 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

- ✚ 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 waste water 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 & analyses 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:

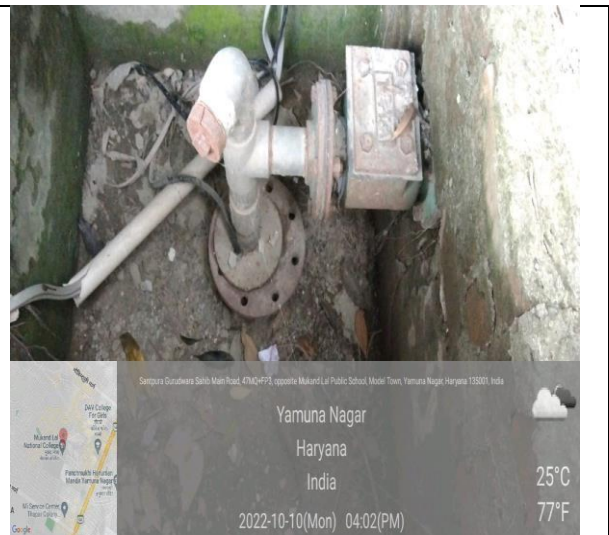
The main source of freshwater is bore well for the college. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project.

Details of Fresh water sources

Sr.No.	Location	Capacity (HP)	Phase	Running Hour
1	Bore well -1 Near College ground	15	3p	6-8 hour
2	Bore well -2 Near College ground	5	3p	2- 3 hour



Borewell -01



Borewell -02

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 College Ground	15	411	22.6	6 to 7 Hours
2	Bore well -02	In College Ground	5	408	10.5	2 to 3 Hours

2.3 Water Accounting & Metering system

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



Observation;-

Environment audit team observed 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.

2.4 Water Storage Capacity in College Campus

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

Water storage tank in college campus

Sr. No.	Location	No. of Tank	Tank Capacity	Material
1	Chemistry Block	1	20,000 Ltr	RCC
2	Auditorium	2	1000 Ltr Each	Syntax
3	Arts block	1	1000 Ltr Each	Syntax
4	College House	1	1000 Ltr Each	Syntax
5	Admin block	1	1000 Ltr Each	Syntax
6	TIMT Building	2	2000 Ltr Each	Syntax

Photographs of water storage tanks.



Fig: - 2.4 Water storage tank in college campus

2.5 Fresh Water distribution layout of college

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

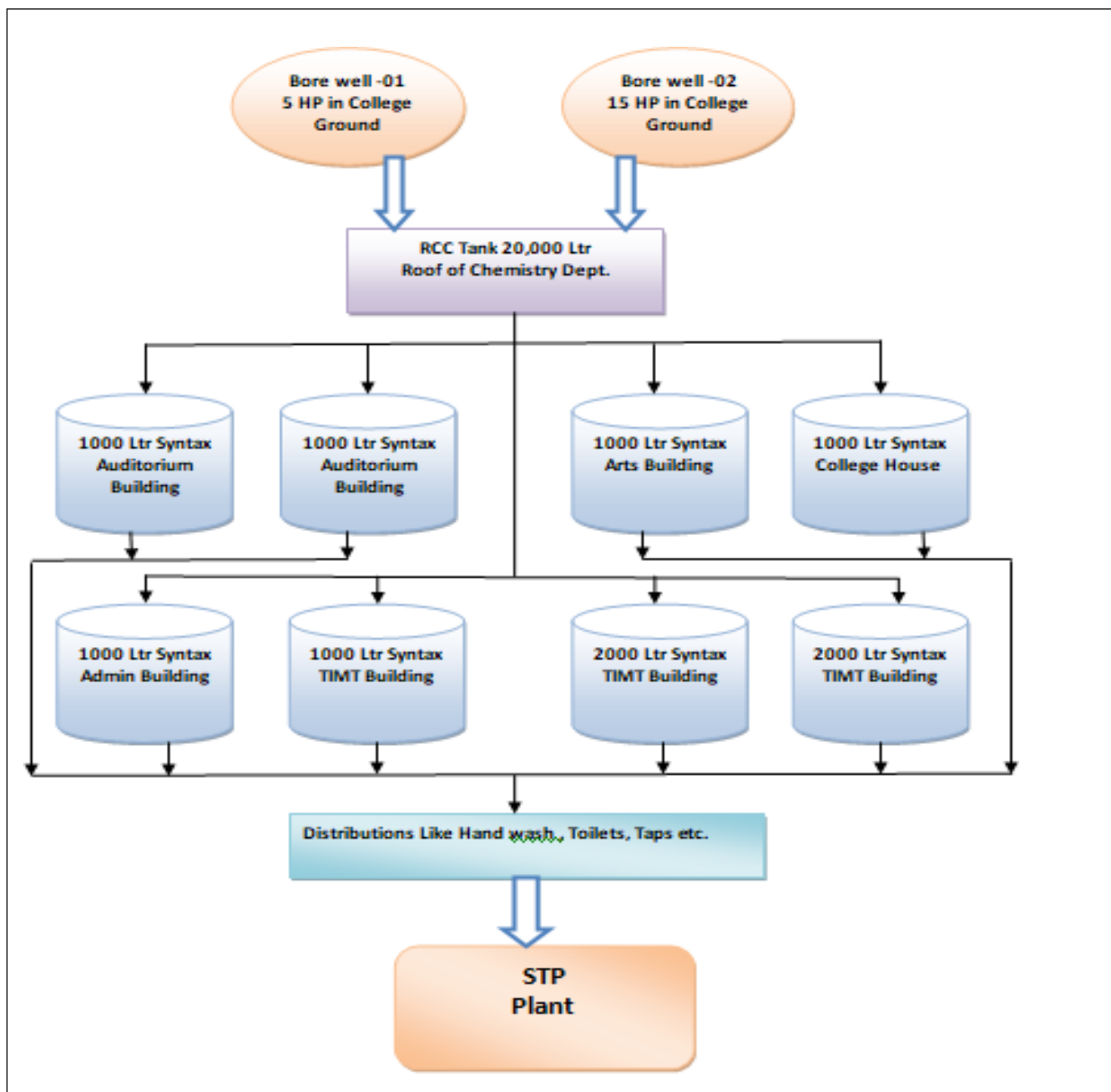


Fig: - 2.5 Layout of college water distribution

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 appliances. The details of washroom, toilet and taps are given in table

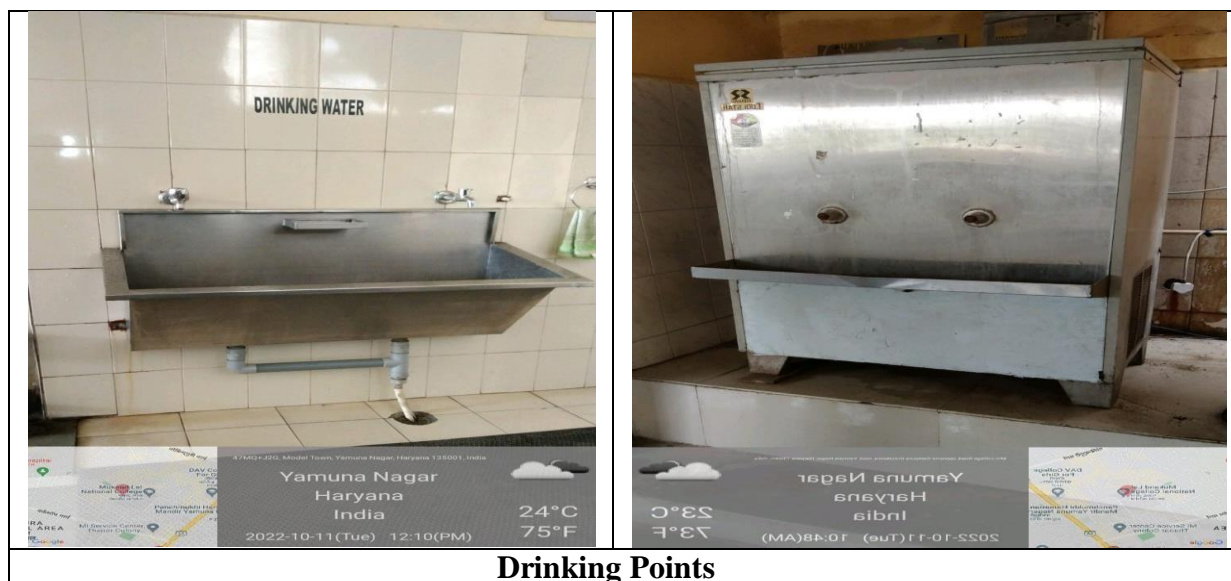
Details of washroom and uses taps in various areas

Sr. No.	Location	Urinals	Taps	Toilets	Handwash
1	Conference Hall	3	4	4	4
2	Canteen	3	3	3	4
3	Girls Common Room	0	3	3	2
4	Arts Block	4	3	3	2
5	Near Computer Lab	6	1	2	2
6	Science Block	4	2	2	2
7	Zoology	0	1	1	1
8	Commerce block	1	2	1	2
9	PG Block	4	1	1	1
10	Auditorium hall	5	10	10	7
11	College House	0	6	6	8
12	Gymnasium	2	4	2	2
13	Sports Block	0	2	2	2
14	Servent Quarter	0	2	2	2
	Total	32	44	42	41

2.7 Details of water cooler in college campus

Details of water cooler in college campus

Sr.No.	Location	No of Water Cooler	Water Purifier
1	Cafeteria	1	1
2	Girls Common Room	1	1
3	Arts Block	1	1
4	Science Block	1	1
5	Near Computer Lab	1	1
6	P.G.Block	1	1
7	Sports Block	1	1
8	Commerce Block	1	1
9	Principal + Staff Room	0	1
	Total	8	9



2.8 Fresh water uses for gardening:

The one of major contribution from fresh water consumption is watering for plants in college campus. There is good potential for water saving by adoptent “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.

Water use for gardening



Proposed Adjustable Misting Nozzle Irrigation Drippers Proposed water timer

2.9 Waste Water Generation Sources: -

At present waste water generated from various departments, canteen, hostels and chemical lab, washrooms, hand wash, washing of medical equipment's and RO rejected etc. It is collect in separate tank and treated in STP plant. After that treated water is reused in activities like gardening, toilet and wash room etc. **Its appreciable**

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	TIMT Building	Fresh Water	Drinking and other uses
5	College House	Fresh Water	Drinking, domestic and other activities
6	Ground + Other	Fresh Water	For Gardening Purpose

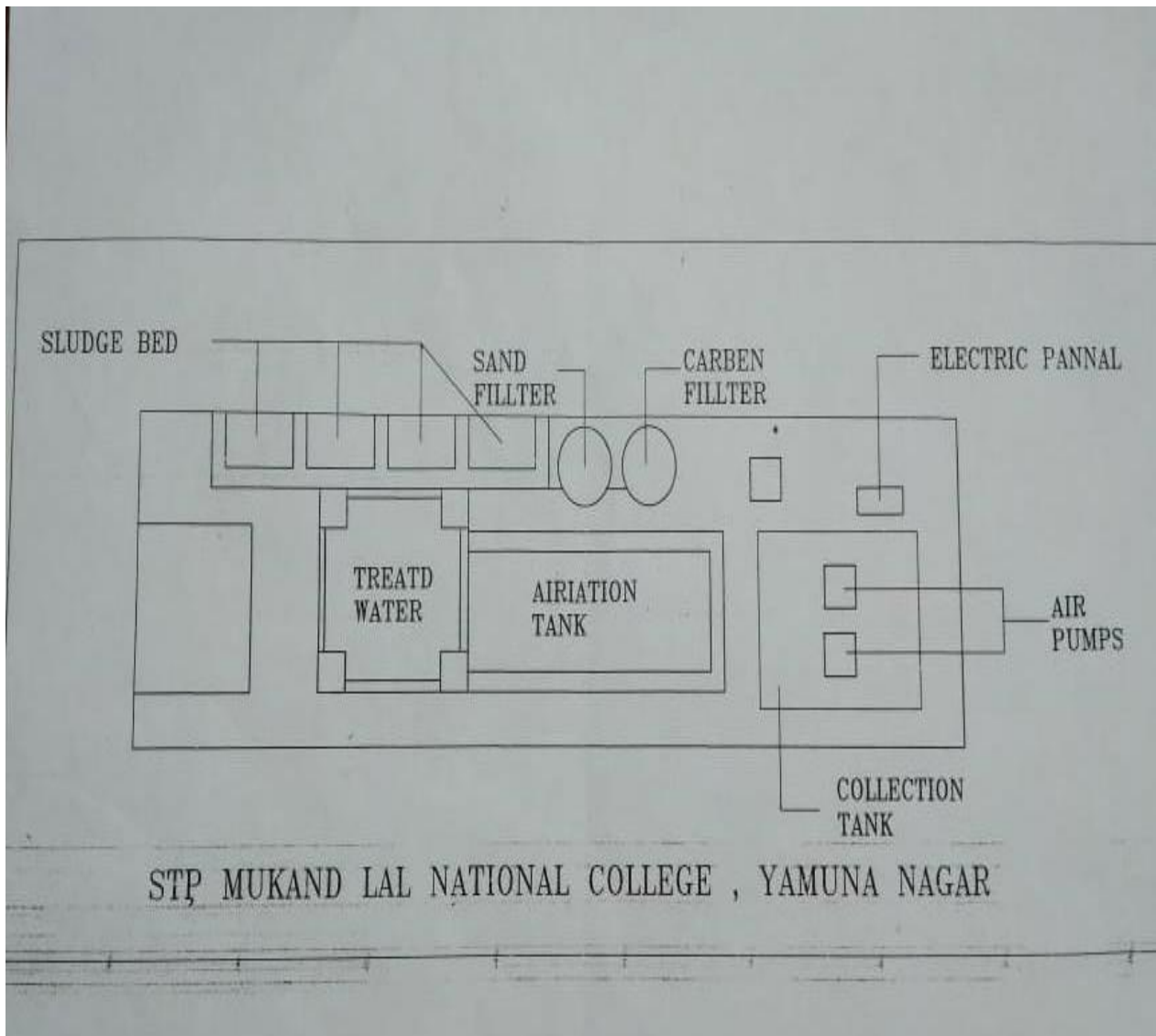
Some Photo Graphs of waste water generation source



2.10 Waste Water Treatment Plant: -

College has installed an STP plant for waste water treatment. After the treatment water is utilized for the gardening purpose

The layout of the STP plant: -



STP Installation details

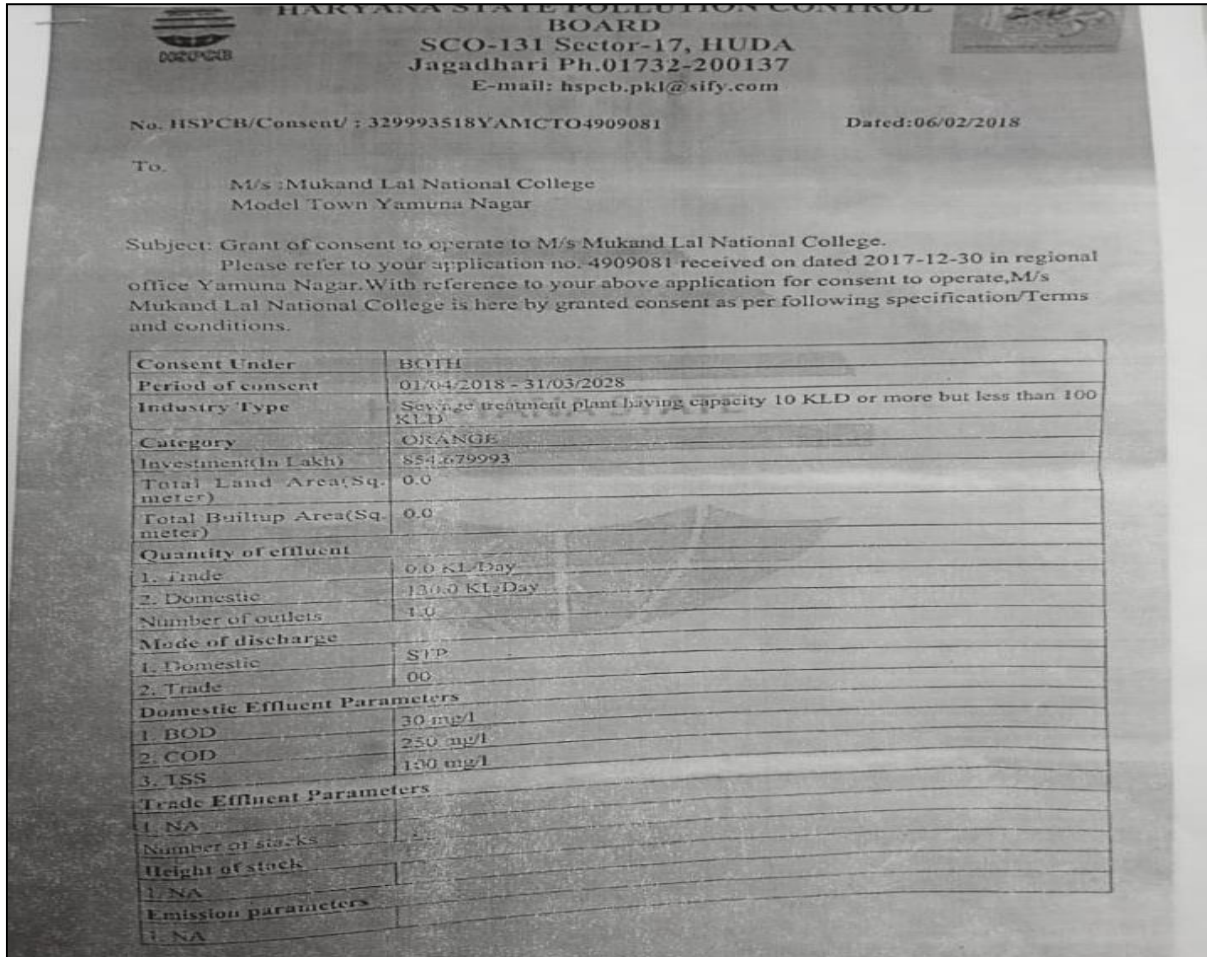


Photo of STP Plant

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.

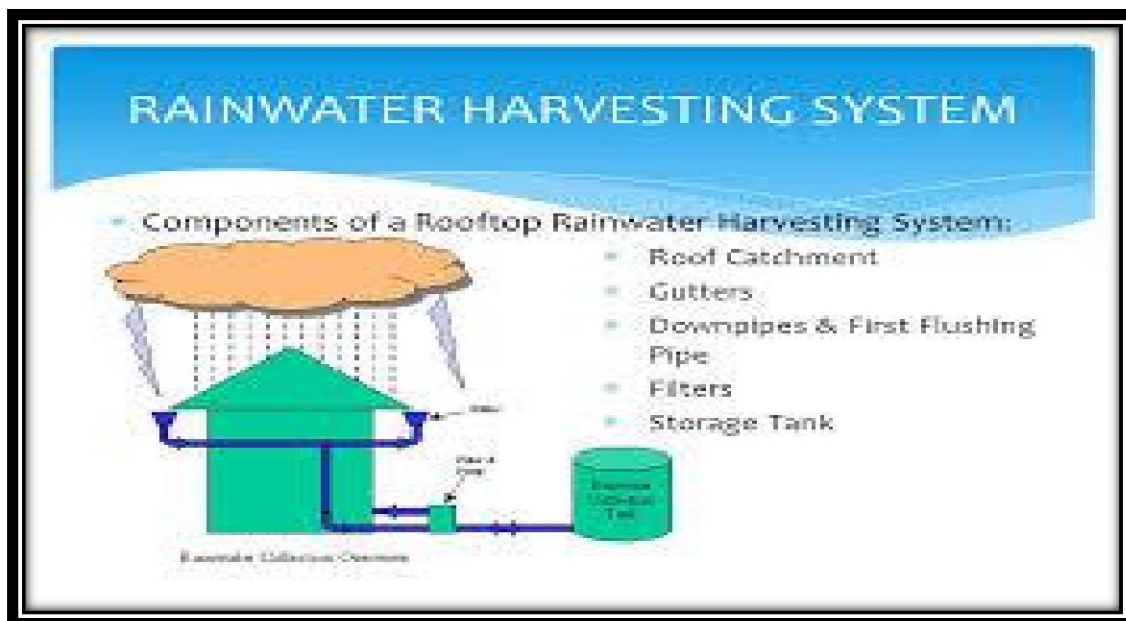
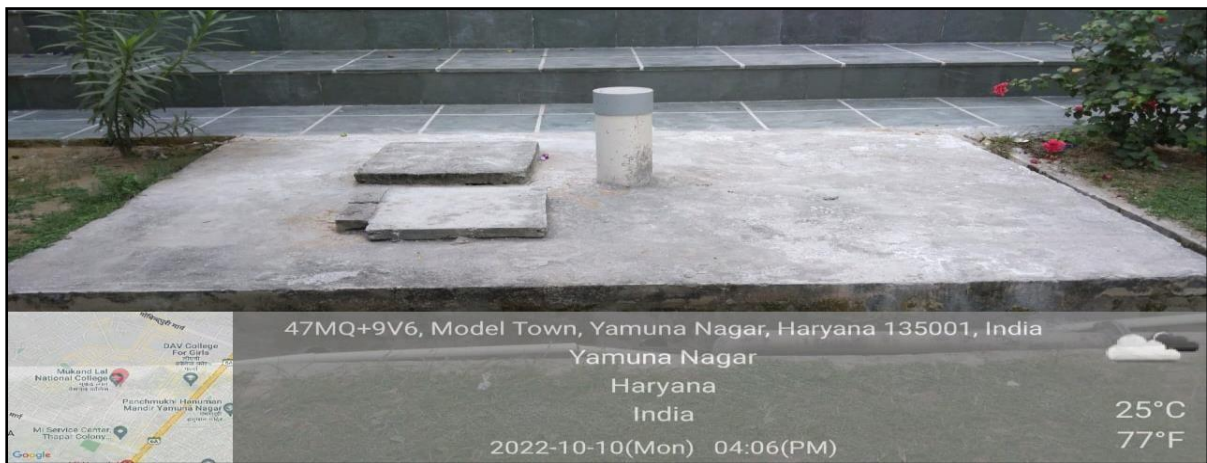
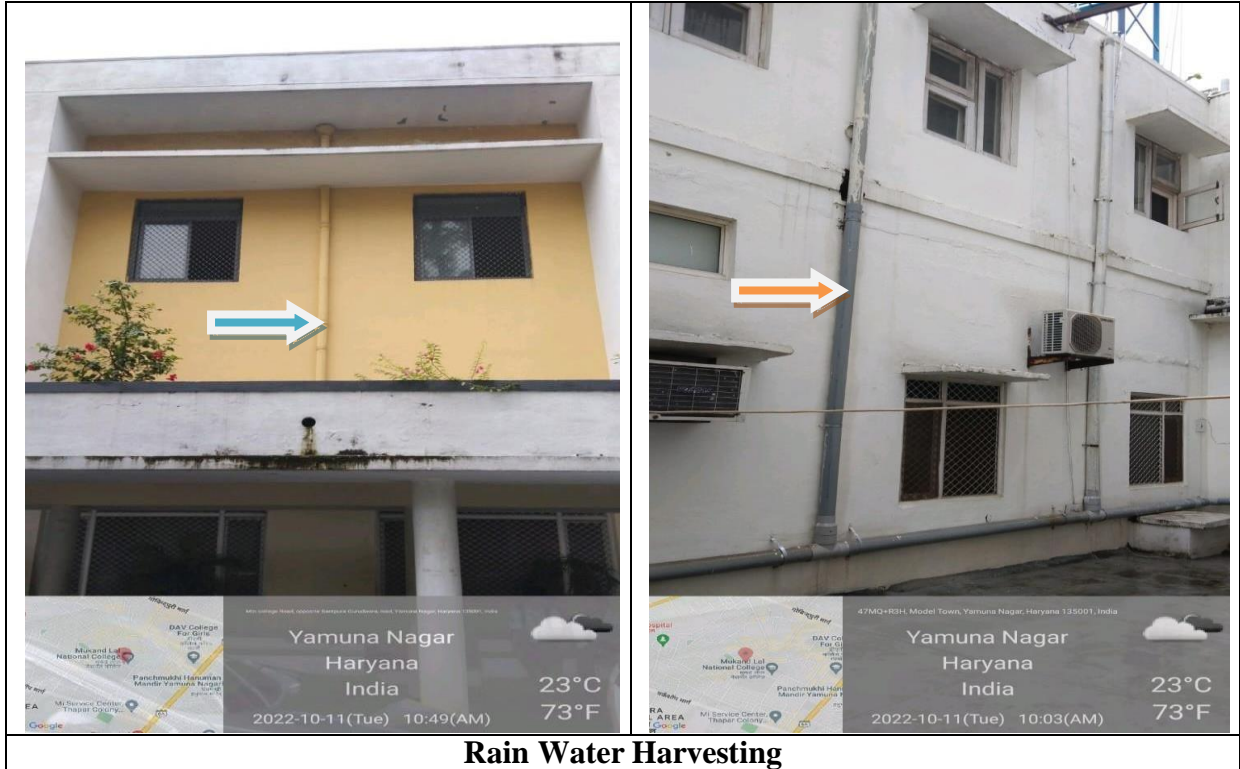


Figure: - 3.1 Components of a rooftop rainwater harvesting system

3.2 Rain water Harvesting Potential of the College

Various types of Buildings like Admin Block, Arts Block, Science Block, Commerce Block, Cafeteria, Sports Block, College House, Gymnasium, Auditorium, P.G. Block etc. RainWater harvesting is installed .It is Appreciable





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END OF THE REPORT

THANKS