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Ref No: EEPL/2022-23/ENVI/003

Date: - 20-05-2022

ENVIRONMENTAL AUDIT CERTIFICATE

This is certified that Empirical Exergy Private Limited (EEPL) Indore M.P. has conducted an Environmental audit at **Mewar University, Chittorgarh (Rajasthan)** for the academic year 2021-22, and the audit report has been submitted.

We avail this opportunity to express our deep and sincere gratitude to the management for their wholehearted support and co-operations during the environmental audit.

This certificate is being issued based on the Environmental Audit conducted by EEPL.

For- **Empirical Exergy Private Limited**



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]

ENVIRONMENT AUDIT REPORT

CONSULTATION REPORT



MEWAR UNIVERSITY

Gangrar Chittorgarh (Rajasthan)

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

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(2021-22)



**Environment Audit Report
Mewar University, Gangrar Chittorgarh
(Rajasthan) Year 2021-22**



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(Rajasthan) Year 2021-22**



ACKNOWLEDGEMENT


Empirical Exergy Private Limited (EEPL), Indore (M.P) takes this opportunity to appreciate & thank the management of **Mewar University Gangrar Chittorgarh** for allowing us to conduct an environmental audit for the university.

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 study.



Rajesh Kumar Singadiya
(Director)


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BUREAU OF ENERGY EFFICIENCY

Examination Registration No.: **EA-7271**

Accreditation Registration No.: **AEA-284**



Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at has been given accreditation as accredited energy auditor. The certificate shall be effective from **9th** day of **May, 2018**


The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No. **284** in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**


Secretary,
Bureau of Energy Efficiency
New Delhi

Green Monitoring Committee.

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, CHITTORGARH (RAJ.).

No. MU/RO/Admin/2022/1450

Dated : 4/5/2022

OFFICE ORDER

Reconstitution of Green, Environment & Energy Auditing Committee

Green Audit, Environment Audit & Energy Audit Committee is reconstituted to conduct the necessary audit in due course. Members of the Audit Committee are mentioned below:

S. No.	Name	Designation	Committee Role
1	Dr. Y. Sudershan	Professor & Dean, Department of Agriculture	Co-Ordinator
2	Mr. Rakesh Kumar Singadiya	Director, Empirical Exergy Pvt. Ltd.	External Auditor
3	Dr. Neelu Jain	Associate Professor, Department of Agriculture	Internal Auditor
4	Dr. Satish Kumar Ameta	Asst. Professor, Department of Life Science	Internal Auditor
5	Mr. Deepak Kumar Joshi	Asst. Professor, Department of Electrical Engg.	Internal Auditor
6	Dr. Mohd. Ashid	Asst. Professor, Department of Chemistry	Member
7	Ms. Nirma Kumari Sharma	Asst. Professor, Department of Electrical Engg.	Member
8	Mr. Suraj Kumhar	Asst. Professor, Department of Electrical Engg.	Member
9	Mr. H. Widhani	OSD	Member
10	Mr. Narendra Kumar Ved	Non-Teaching Staff	Member
11	Ms. Sanchita Karnik	Non-Teaching Staff	Member

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

1. PS to Hon'ble Chairperson for Kind information.
2. PS to President/Pro President for kind information.
3. Deans/Directors/CoE for Information.
4. All HoDs for information.
5. Concerned Committee Members
6. Coordinator, IQAC Cell.
7. Admission/Accounts/Examination/Stores/IT Support/Library/
8. Wardens/Maint.I-C/Receptionist



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The 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]
- ✚ **Dr. Suresh Kumar Soni** [Certified Energy Auditor & Energy Expert]
- ✚ **Mr. Sachin Kumawat** [Sr. Project Engineer]
- ✚ **Mr. Lokesh Kumar Varma** [Project Engineer]
- ✚ **Mr. Mohit Malviya** [Fire safety Engineer]
- ✚ **Mr. Aakash Kumawat** [Site Engineer]
- ✚ **Mr. Ajay Nahra,** [Sr. Accountant & admin]

EXECUTIVE SUMMARY

The executive summary of the environmental 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.

SUSTAINABLE INITIATIVE TAKEN BY UNIVERSITY: -

WASTEWATER TREATMENT PLANT: -

University has installed a sewage treatment plant (STP) for wastewater generated in various activities on the university campus. The output of the plant is 14.5 m³/hr. University has utilized treated water for gardening purposes. **It's Appreciable.**

RECOMMENDATION

WATER MONITORING SYSTEM

University has planned the installation of water flow meters to quantify the real-time water consumption of the university.

DRIP WATER IRRIGATION SYSTEM FOR GARDENING.

University has a water sprinkler system in the lawn area. **It is Appreciable.** It is recommended to use of drip water irrigation system for gardening can save 10 to 20 % of fresh water.



Environment Audit Report Mewar University, Gangrar Chittorgarh (Rajasthan) Year 2021-22



CHAPTER-1 INTRODUCTION

1.1 About University

Mewar University is an autonomous body set up by the Government of Rajasthan through Act. No. 4 of 2009 passed by the Rajasthan Legislative Assembly (Government of Rajasthan). The University is recognized by the UGC u/s 2(f) of UGC Act with powers to confer degrees u/s 22(1) of the UGC Act, 1956 vide their letter no. F.9-15/2009(CPP-I) dated 30th March 2009. This is the only private and self-financed University in Rajasthan which is also approved by the UGC u/s 12B of the UGC Act vide their letter No. F.9-15/2009 (CPP-I/PU) dated 15th October 2018. The University is also NAAC accredited.

Mewar University has never affiliated with any institution, nor has the University ever set up any study center in any part of the country other than its main campus at Gangrar in Chittorgarh (Rajasthan).

Mewar University is promoted by the Mewar Education Society (MES). It is controlled by a Board of Management, constituted by the MES, which is headed by Chairperson Shri Ashok Kumar Gadiya, a great visionary, educationist, and nationalist, who translated his ideas and dreams of promoting higher education into reality by setting up institutes of learning in various subjects. In no time, he has carved out a niche for himself as an educationist, who believes in the inculcation of values through education in the young generation.

The group, under the able leadership of Dr. Ashok Kumar Gadiya and the active support and association of renowned academicians, experienced professionals, and technocrats, has established a chain of Institutes of higher education and learning:

Mewar Institute of Management

Mewar Institute of Management, Vasundhara, Ghaziabad (U.P.) [Approved by the UGC and affiliated with C.C.S. University, Meerut, conducting courses for B.B.A., M.B.A., B.C.A., M.C.S., M.I.S., B.Ed, B.Lib, and M.Sc. (Biotech)]

Mewar Law Institute



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Mewar Law Institute, Vasundhara, Ghaziabad (U.P.) [Approved by the UGC, Bar Council of India and affiliated to C.C.S. University, Meerut, conducting courses for L.L.B. (3Yrs) & L.L.B. (5Yrs)]

Mewar Girls Business School

MewarGirls Business School, Vasundhara, Ghaziabad (U.P.) [Approved by the AICTE and affiliated to UP Tech University, Lucknow, conducting M.B.A. courses for Girls]

Mewar Girls College

MewarGirls College, Chittorgarh [Approved by Government of Rajasthan and affiliated to Mohan Lal Sukhadia University, Udaipur, conducting courses for M.I.B., B.Sc (Biotech.), B.B.M., B.C.A. & P.G.D.C.A.]

Mewar Girls Ayurved Nursing Centre

Mewar Girls Ayurved Nursing Centre, Chittorgarh [Approved by Government of Rajasthan and affiliated to Rajasthan Ayurved University, Jodhpur, conducting courses for Ayurved Nursing]

Mewar Girls Industrial Training Centre

Mewar Girls Industrial Training Centre, Chittorgarh [Approved by Government of India (NCVT) and Board of Technical Education, Jodhpur, (SCVT), conducting courses for Computer Operator and Programming Assistant, Interior Decoration, Fashion Designing, Dress Making, English Language Proficiency and Personality Development]

Mewar Girls College of Teachers Training

Mewar Girls College of Teachers Training, Chittorgarh [Approved by Government of India (NCTE) and affiliated to Mohan Lal Sukhadia University, Udaipur, conducting courses for B.Ed., N.T.T, S.T.C]

These centers of learning exemplify the group's mission to promote quality technical and higher education. And as a result, the number of students has gone up considerably, and now it has more than 10,000 students on its campuses.

The group, continuing with its mission to provide higher and technical education to a larger section of people, has touched a new height by promoting and sponsoring Mewar University. The promoting body, with its honest efforts and unstinting dedication, has the conviction to build a strong partnership with the Government of Rajasthan for ensuring the spread of higher and technical education in the state.



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Mewar's culture, ethos, tradition, and values are so ingrained in its soil that it is bestowed with the magical powers to sprout prodigious talent and genius. Anyone groomed in this environment will undergo a steady transformation to blossom in life and imbibe the traits of greatness associated with this historical place.

VISION:-

To develop a center of excellence for technical, professional, and vocational education and research at par with national and international standards.

MISSION:-

To develop the framework for effectively conducting various educational and research programmes of the highest standards to produce confident, self-reliant, and responsible youth for society and outstanding professionals for government, industry, and business. The mission is to "**Reach the Unreached**"

Objective:-

- ❖ Provide easy access to high-quality education in Management, Engineering, as well as other academic & professional fields to its students, irrespective of their caste, creed, age, gender, region, or country, at an affordable cost.
- ❖ To offer a conducive environment for pursuing research and vocational studies with a market-driven orientation.
- ❖ To expose students to new ideas, fresh vision, and pragmatic ambition and enhance their competency in the ever-changing business environment.
- ❖ To provide a flexible choice-based credit system of education and dual-degree programmes while flexible adopting modes of delivery to suit students' requirements of learning.
- ❖ To prepare and assist students in improving their future prospects through career counseling and placement support, on-the-job training, industrial visits, presentations, and group discussions.
- ❖ To Promote and practice a convenient distance education concept in India and abroad.
- ❖ To spread job-oriented Skill Development education in rural and tribal areas



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1.2 About Campus: -

Table 1.1 Details are the total build-up area given in the table:-

TOTAL GROUND COVERED. =20856.78 SQ.MT									
TOTAL OVERALL BUILT-UP ALL FLOORS AREA:- 76024.72 SQ.MT									
S.NO	BLOCK	FAR AREA				BUILT AREA			
		GROUND FLOOR AREA IN SQ.MT	FIRST FLOOR AREA IN SQ.MT	SECOND FLOOR AREA IN SQ.MT	THIRD FLOOR AREA IN SQ.MT	GROUND FLOOR AREA IN SQ.MT	FIRST FLOOR SQ.MT	SECOND FLOOR AREA IN SQ.MT	THIRD FLOOR AREA IN SQ.MT
1	ADMINISTRATIVE AND ACADEMIC BLOCK.	8890.84	8519.33	8675.24	8675.24	8966.05	9050.97	9206.74	9206.74
2	EDUCATION BLOCK	1062.08	1170.08	1062.08	1062.1	1193.08	1253.27	1126.29	1126.29
3	ENGINEERING BLOCK	1979.9	11979.9	1979.9	0	2126.84	2093.74	2093.74	0
4	MEWAR HOSPITAL	1337.03	1337.03	0	0	1590.91	1590.91	0	0
5	BHAMASHAH HOSTEL	1382.11	1382.11	1382.11	1382.1	1601.64	1572.82	1572.82	1572.82
6	SANGA HOSTEL	1189.78	1189.78	1189.78	1189.8	1359.6	1341.62	1341.62	1341.62
7	KUMBHA HOSTEL	602.71	602.71	620.65	620.65	709.19	697.35	697.35	697.35
8	PRATAP HOSTEL	640.52	640.52	665.78	665.78	749.38	739.64	739.64	739.64



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S.NO	BLOCK	FAR AREA				BUILT AREA			
		GROUND FLOOR AREA IN SQ.MT	FIRST FLOOR AREA IN SQ.MT	SECOND FLOOR AREA IN SQ.MT	THIRD FLOOR AREA IN SQ.MT	GROUND FLOOR AREA IN SQ.MT	FIRST FLOOR SQ.MT	SECOND FLOOR AREA IN SQ.MT	THIRD FLOOR AREA IN SQ.MT
9	PANNA DHAI HOSTEL	376.53	376.53	382.3	382.3	447.6	435.97	435.97	435.97
10	MEERA HOSTEL	323.13	323.13	323.13	323.13	386.87	381.68	381.68	381.68
11	GUEST HOUSE	229.94	223.58	223.58	223.58	295.78	258.82	258.82	258.82
12	STAFF QUARTERS(1 BHK)	285.11	285.11	285.11	285.11	367.6	362.67	362.67	362.67
13	STAFF QUARTER	276.99	276.99	276.99	276.99	353.84	349.18	349.18	349.18
14	ANNAPURNA MESS	613.7	0	0	0	708.4	0	0	0
	TOTAL	19190.37	28306.8	17066.65	15086.78	20856.78	20128.64	18566.52	16472.78

Mewar university from Google map

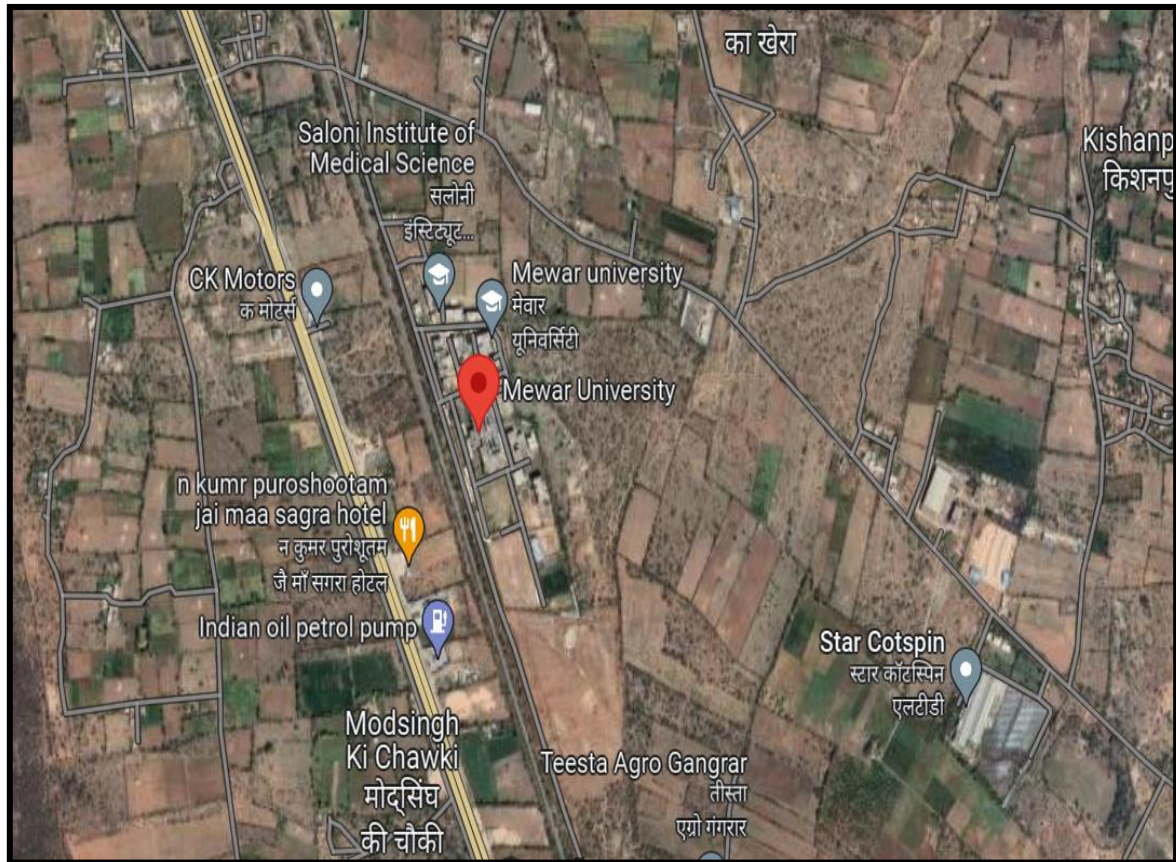
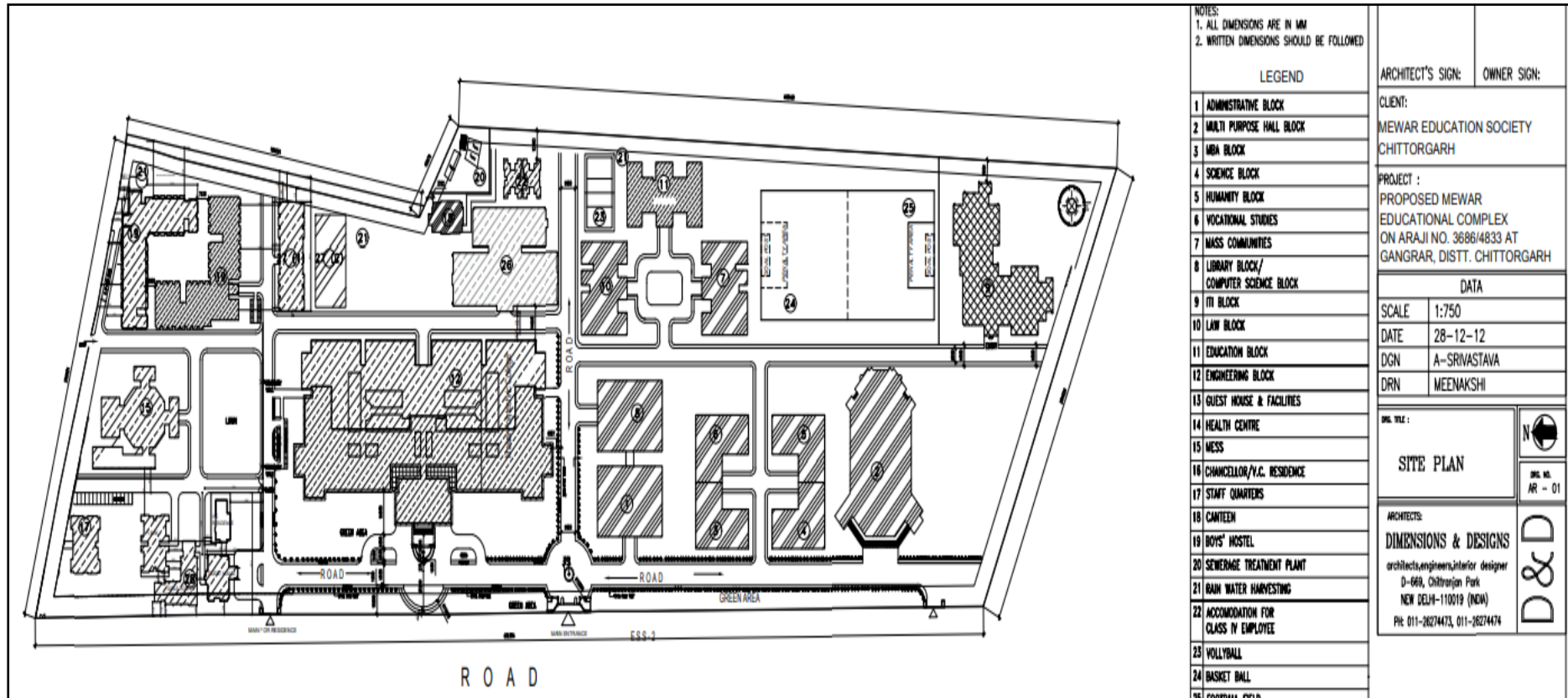


Figure 1.1: - Satellite Image of Mewar university from Google map

1.3 MEWAR UNIVERSITY LAYOUT OF VARIOUS BUILDINGS

Layout map of Mewar University





1.4 Environment Auditing

Environment audits can be a highly valuable tool for an institute 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.

1.5 Objectives of Environment audit

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

The specific objectives are:

-  To monitor freshwater consumption in the university and water conservation practices.
-  To assess the quantity of water, usage, the quantity of wastewater generation, and their reduction within the university.

1.6 Target Areas of Environment audit

This indicator addresses water sources, water consumption, irrigation, stormwater, 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.

1.7 Methodology followed for conducting Environment audit

Step 1: Walkthrough 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

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

Step 3: Site Environment Audit Planning (based on 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 & analyzed water balancing and measurement details
- ✚ Projects and procedures to maximize water savings and minimize water losses.
- ✚ Opportunities for water conservation based on reducing/recycling/ reuse and recharge options

CHAPTER- 2

WATER CONSUMPTION AND WASTEWATER SOURCES

2.1 Details of Source of Fresh Water and Use Areas:

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

Table:2.1 Details of Freshwater sources.

Sr. No.	Fresh Water Sources	Location	Motor Power (HP)	Remark
1	Open Well	The back side of the Sanga hostel	10	For Freshwater Supply
2	Borewell-01	Near Open Well	5	For Freshwater Supply
3	Borewell-02	The back side of the Mess	3	For Freshwater Supply
4	Borewell-03	Near Temple	7.5	For Freshwater Supply
5	Borewell-04	Near STP Plant	5	For Freshwater Supply
6	Borewell-05	Near MBA building	3	For Freshwater Supply
7	Transfer Pump-01	UG Tank Near Mess	5	Transfer Pump
8	Transfer Pump-02	UG Tank Near Khajuri	5	Transfer Pump
9	Transfer Pump-03	UG Tank Near Khajuri	5	Transfer Pump
10	Transfer Pump-04	UG Tank near MBA Tank	7.5	Transfer Pump
11	Transfer Pump-05	STP outlet	5	Transfer Pump



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2.2 Water Flow Measurement and Power measurement: -

Table 2.2: - Flow and power measurement of borewells.

Sr. No.	Fresh Water Sources	Location	Motor Power (HP)	Voltage	Current	Power Factor	Power Consumption (kW)	Measured Water Flow (m ³ /hr)	Working (Hr./day)	
1	Open Well	Back side of Sanga hostel	10	407	14.3	0.78	7.9	9.6	20	
2	Borewell-01	Near Open Well	5	405	11.3	0.82	6.5	5.7	20	
3	Borewell-02	Back side of Mess	3	402	5.3	0.84	3.1	2.5	20	
4	Borewell-03	Near Temple	7.5	Under Maintenance						
5	Borewell-04	Near STP Plant	5	399	4.5	0.79	2.5	2.1	20	
6	Borewell-05	Near MBA building	3	397	5.1	0.86	3.0	1.5	20	
7	Transfer Pump	UG Tank Near Mess	5	402	10.1	0.86	6.0	5.6	20	
8	Transfer Pump -01	UG Tank Near Khajuri	5	403	11.1	0.83	6.4	10	20	
9	Transfer Pump -02	UG Tank Near Khajuri	5	401	9.4	0.78	5.1	4.4	20	
10	Transfer Pump	UG Tank near MBA Tank	7.5	398	9.6	0.85	5.6	8.5	20	
11	Transfer Pump	STP outlet	5	398	7.6	0.86	4.5	14.5	12	

Observation: - It was measured that the average freshwater consumption of the university from open well and borewell is 15.7 M³/Hr.

2.3 Water Accounting & Metering system:

It was observed that there is a requirement for water flow meters on borewells to quantify per day groundwater extraction from different sources.



ultrasonic flow Meter installation at university tank



Water measurement by bucket method.



Measurement at STP outlet

Figure: - 2.1 Water flow measurement on the university campus.

2.4 Water Storage Capacity in University Campus: -

There are different types of tanks available in the university for water storage like Underground RCC tanks, Overhead RCC tanks, PVC tanks, etc.

Table 2.3: - Water Storage tank in university campus

Sr. No	Location	Type of Tank	Unit Capacity (Liter)	Quantity	Total Capacity (Liter)	Total Capacity (Kilo Liter)
1	Administrative and Academic Block, Annapurna Mess and Education Block	Underground (RCC tank)	1,00,000	4	4,00,000	400
2	Administrative and Academic Block	Overhead tank (RCC)	40,000	2	80,000	80
3	Guest House	Overhead tank (RCC)	30,000	1	30,000	30
4	Workshop	Overhead tank (RCC)	50,000	1	50,000	50
5	MBA Building	Overhead tank (RCC)	30,000	1	30,000	30
6	Panna Girls hostel	Overhead tank (RCC)	15,000	1	15,000	15
7	Annapurna Mess	Overhead tank (RCC)	30,000	1	30,000	30
8	2 BHK residency	Overhead tank (RCC)	15,000	1	15,000	15
9	1 BHK Residency	Overhead tank (RCC)	30,000	2	60,000	60
10	1 BHK Residency (B- Block)	Overhead tank (RCC)	30,000	4	1,20,000	120
11	Kumba Hostel	Overhead tank (RCC)	20,000	2	40,000	40
12	Pratap Hostel	Overhead tank (RCC)	20,000	2	40,000	40
13	Sanga Hostel	Overhead tank (RCC)	30,000	2	60,000	60
14	Bhabha Sah (International Hostel)	Overhead tank (RCC)	40,000	2	80,000	80
15	Meera Girls Hostel	Overhead tank (RCC)	20,000	1	20,000	20
Total Water Storage Capacity of Mewar university: -					1,70,000	1,070

2.5 Photographs of water storage tanks.



Fresh Water Storage tank



RO Treated water storage tanks

Fig:- 2.2 Water Storage Tank and capacity of University Campus

2.6 Water use areas on University Campus: -

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

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

Admin block						
Sr.No.	Location	Urinals	Hand wash	Toilets	Taps	Drinking Taps
1	Basement	14	23	23	46	22
2	First floor	13	26	28	56	
3	Second floor	18	25	33	66	
4	Third floor	22	27	37	74	
M.B.A. Block						
Sr.No.	Location	Urinals	Hand wash	Toilets	Taps	Drinking Taps
1	Ground floor	5	8	6	12	4
2	First floor	5	8	6	12	4
3	Second floor	5	8	6	12	4
4	Third floor	5	8	6	12	4
Engineering Block						
Sr.No.	Location	Urinals	Hand wash	Toilets	Taps	Drinking Taps
1	Ground floor	4	4	6	12	4
2	First floor	5	4	5	10	4
3	Second floor	3	4	6	12	4

Sr. No.	Location	Urinals	Hand wash	Toilet	Bathroom	Taps	Drinking Taps
1	Bhamashah International Hostel	0	114	114	0	228	4
2	Sanga Boys Hostel	16	28	32	32	64	16
3	Kumbha Boys Hostel	16	24	32	32	64	16
4	Pratap Boys Hostel	24	48	48	48	96	8
5	Panna Dhari Girls Hostel	0	12	32	32	64	16
6	SC Meera Girls Hostel	0	12	24	24	48	8

2.7 Details of RO in University Campus.

Table 2.5: - Details of RO on the campus.

Sr. no	Location	Capacity (Litre)	Quantity
1	Main Building	500	1
2	Veg Mess	500	1
3	Kumbha Hostel	100	1
4	Pratap Hostel	100	1
5	Sanga Hostel	100	1
6	Panna Hostel	100	1
7	Guest house	50	1
8	Meera Hostel	100	1
9	1 BHK (B- Block)	50	1
10	MBA Building	100	1
11	BhamaShah International Hostel	50	1

2.8 Fresh Water uses for Gardening:

University has installed a water sprinkler system for the lawn area in front of the main university admin block **Its appreciable.**



Figure:-Water Sprinkler system in university lawn

Observation: - There is good potential for water-saving by adopting the “Automatic Watering 360 adjustable misting nozzle irrigation Drippers system” for other areas of the university.

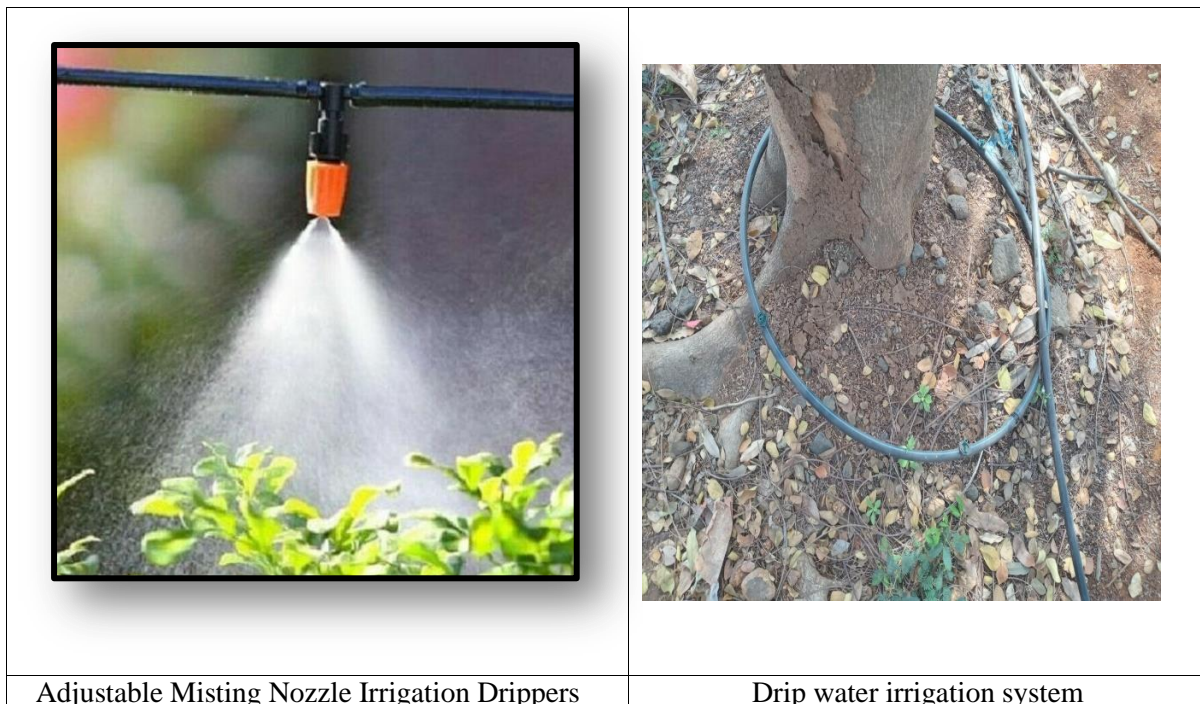


Fig: 2.4 Technology for Drip Water Irrigation for plant

2.9 Waste Water Generation sources: -

At present wastewater is generated from various departments, canteen, mess, hostels like washrooms, handwash, and washing of medical equipment in Pharmacy department and RO rejected water treated in STP plants. After that treated water university to be reused in gardening.

Table: - 2.6 Wastewater generation area on the university campus

Sr. No	Key Water Usage Section	Type of water used (raw, treated, etc.)	Water Consuming activities
1	Admin Block	Fresh Water	Drinking and other uses
2	Hostels	Fresh Water	Drinking, Food cooking, other Uses
3	Institution Buildings	Fresh Water	Drinking and other uses
4	Canteens /Mess	Fresh Water	Food cooking, drinking
5	Residential	Fresh Water	Drinking, domestic and other activities
6	Guest House	Fresh Water	Drinking and other uses

Some photographs of wastewater generation sources are given

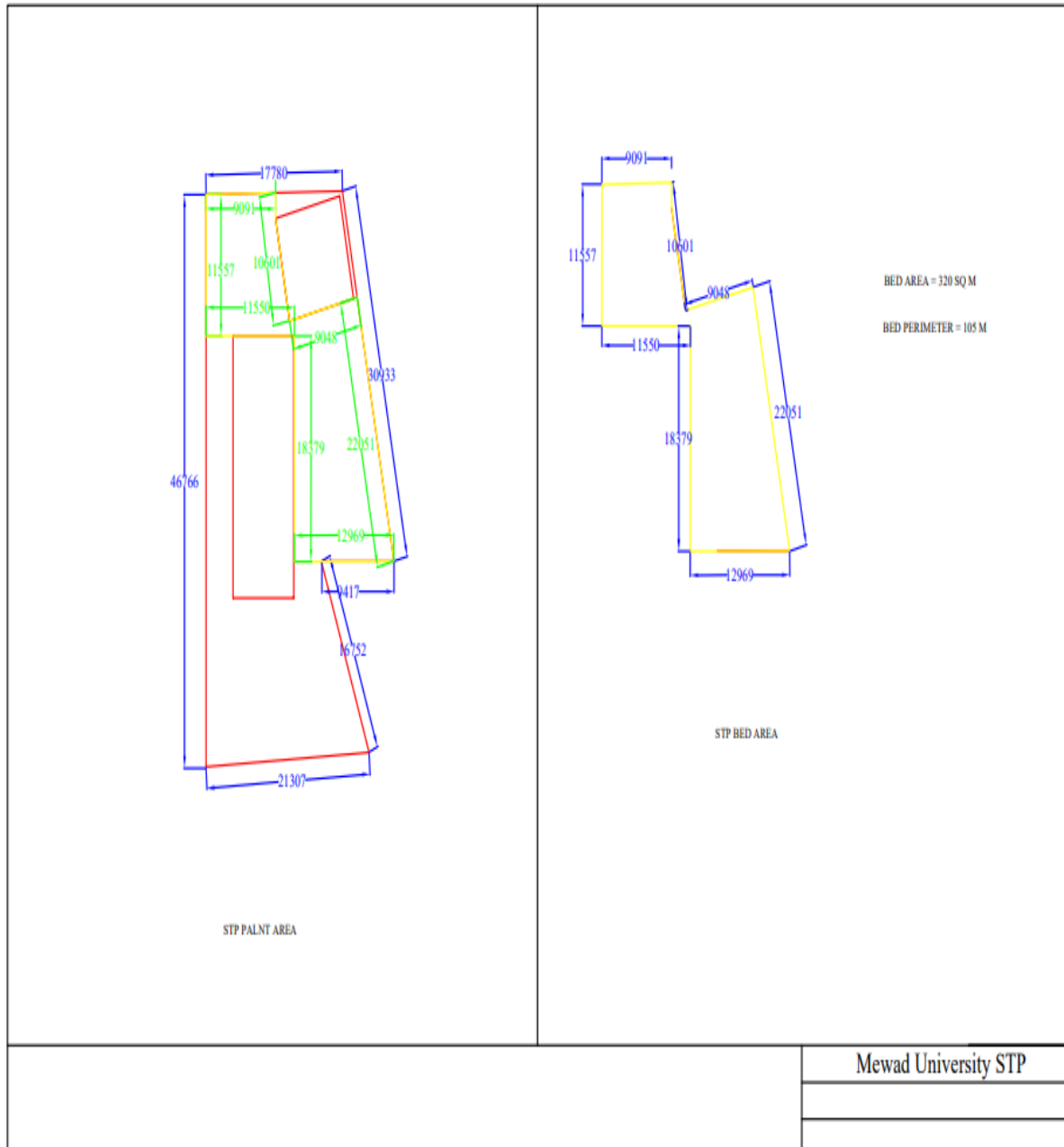


Figure:- 2.5 Waste Water Generation sources

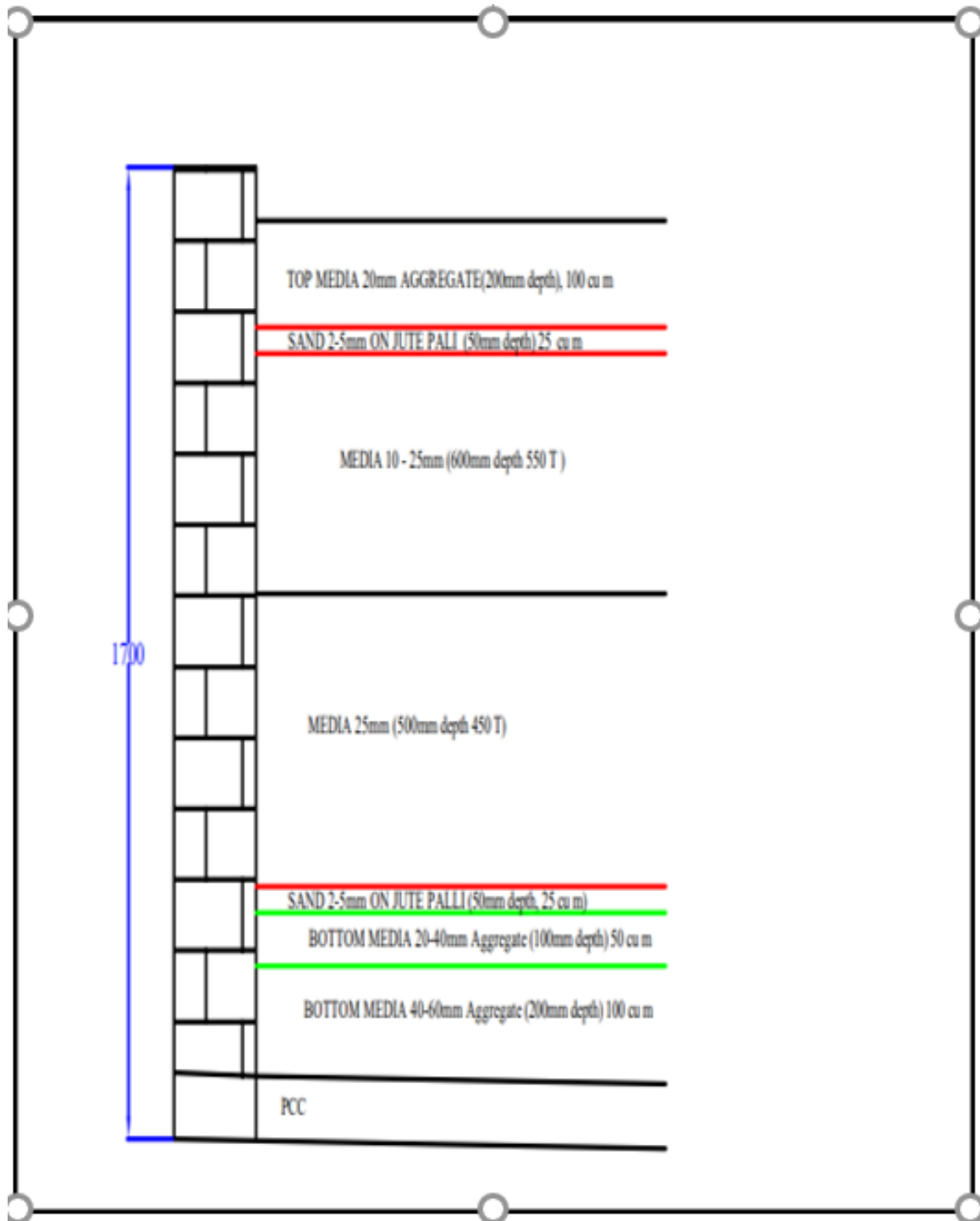
2.10 Waste Water Treatment Plant: -

University has installed an STP plant for wastewater treatment. After the water treatment is utilized for the gardening purpose.

The layout of the STP plant: -



Design of Biological treatment system for STP



Observation: - All wastewater treated in the STP plant and treated water are used for gardening purposes. **It's Appreciable.**

CHAPTER- 3 RAINWATER HARVESTING SYSTEM

3.1. Rainwater Harvesting systems

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 it runoffs quickly and flows out through storm-water drains. For storm-water management, the recharge pits, percolation pits, and porous trenches are constructed to allow stormwater to infiltrate inside the soil.

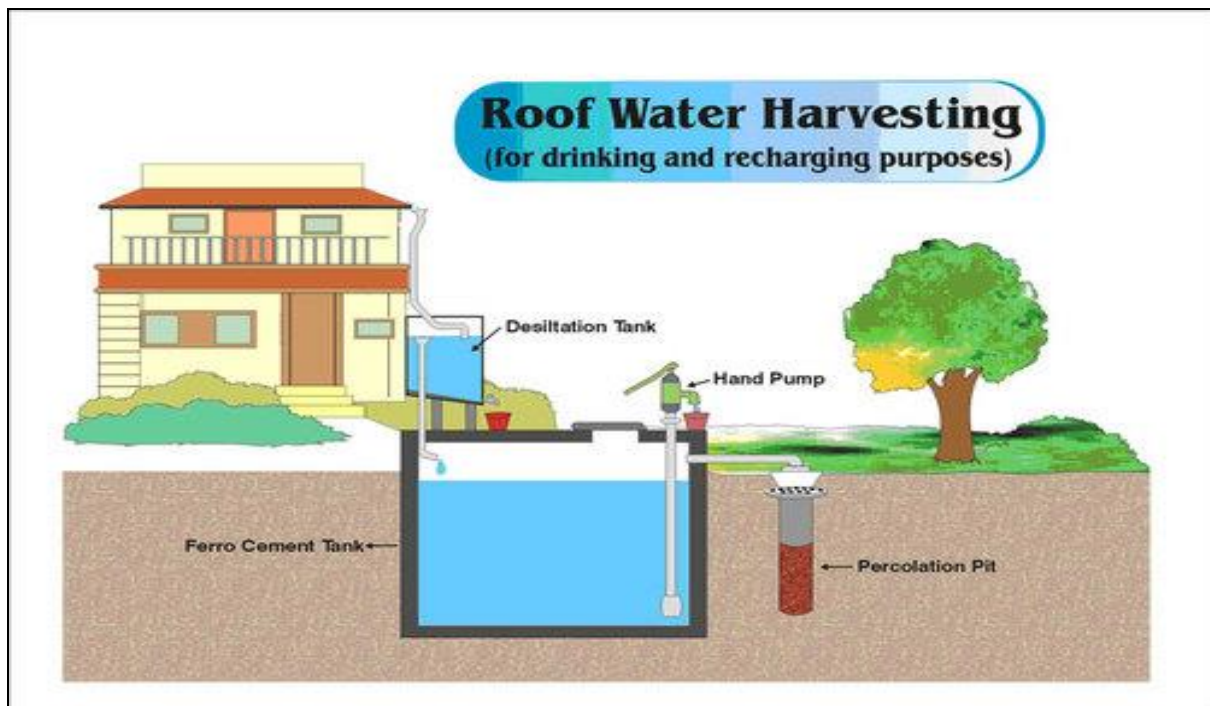


Figure: - 3.1 Components of a rooftop rainwater harvesting system

3.2 Rainwater harvesting system in Mewar University:

University has rainwater harvesting systems on campus.



Figure 3.2:- Rain Water Harvesting System on the university campus



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3.3 Rainwater Harvesting Potential of the College

The university has a total built-up area is approx. 1500 m². The average annual rainfall of 1.064 m and runoff coefficient of 0.88 is considered for commercial building. Accordingly, to the above figures and consideration, the estimated rainwater harvesting potential for the college is about 1404.48 m³/year. The following Mathematical Equation is used for the calculation.

RWH Potential = Rainfall (m) x Area of catchment (m²) x Runoff coefficient



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END OF THE REPORT

THANKS