

6 CLEAN WATER AND SANITATION



SUSTAINABLE DEVELOPMENT GOALS

REPORT 2022



SUSTAINABLE DEVELOPMENT GOALS

6 CLEAN WATER AND SANITATION



SDG6 For environmental sustainability, economic development, and access to clean water and sanitation, freshwater ecosystem management is crucial. The goal of SDG 6 is to "ensure access to water, its sustainable management, and proper sanitation for all." Manipal University Jaipur captures progressive improvements from surface water and use of unimproved water to using an improved water source helps protect against contamination. The Water Management Centre at Manipal University Jaipur addresses several of these concerns in the Indian and global contexts.

Contents

1. Manipal University Jaipur Measuring Water Usage.
2. Water Consumption and Treatment (STP, Annual Rainwater Potential, Storm water harvesting potential, usage of recycle water, efficient fixtures).
3. Manipal University Jaipur Wastewater Treatment.
4. Liquid waste management-inhouse- sewage treatment plant.
5. Rainwater harvesting-water canals in campus.
6. Construction of Ponds.
7. Water Treatment Plants.
8. Water distribution system.
9. Sensor based water conservation.
10. Manipal University Jaipur's Processes to Prevent Water Pollution.
11. Prevention of water pollution at Manipal University Jaipur (clean and smart campus, solid waste management, medical waste segregation management, Solid kitchen waste management, Human resource for waste management).
12. Cleanliness drive in Dehmi Kalan Jaipur.
13. Process flow chart- STP.
14. Manipal University Jaipur Provides Free Drinking Water.
15. Housekeeping staff activity record (monthly)- for water coolers.
16. Manipal University Jaipur Adopts Building Standards to Minimize Water Use
17. Executive Development Programme on Leadership & management for water & sanitation projects.
18. Health & Hygiene -A healthy woman makes a healthy society.”
19. The World café- Understanding SDGs.
20. Water-Conscious Planting.
21. Green Campus at Manipal University Jaipur.
22. Green rated campus-MUJ
23. Green programs- Tree plantation on roadside at vicinity.
24. Green programs- Toilet block at Bagru police station.
25. Work order at Manipal University Jaipur for Pebbles, Plants supply, Softscape work.
26. School of Business and commerce Plantation Drive.
27. School of architecture and design “Tree Plantation Drive” at Govt. School, Bagru
28. School of architecture and design “Tree Plantation Drive” at Govt. School, Begas.
29. School of architecture and design “Tree Plantation Drive” at Govt. School, Dehmi Kalan.
30. School of architecture and design “Tree Plantation Drive” at Govt. School, sanjharia.
31. School of architecture and design “Tree Plantation Drive” at Govt. School, Thikaria.
32. Directorate of Student's Welfare, NCC Activity Report- Tree Plantation.
33. “Vriksharopan Abhiyan” at Manipal University Jaipur on 75th Independence Day.

34. VIP PLANTATION AREA, MANIPAL UNIVERSITY JAIPUR: Course Advance Landscape design.
35. Manipal University Jaipur- Tree/Plants Details.
36. Directorate of Student's Welfare, Hanging of Prindas society connect.
37. Manipal University Jaipur Measures Water Reuse Across Campus
38. Water Conservation facilities available in the Institution.
39. Manipal University Jaipur as Catalysts for Good Water Management Education.
40. Departments of Physics, Innovative Project Ideas by Young Minds.
41. Technology Demonstration & Training Centre Brief Report of TDTC Training (Women Empowerment: Safety, Health, and Hygiene).
42. Architectural Documentation on Tapi Baori of Jodhpur.
43. Manipal University Jaipur Leading the Way in Promoting Conscious Water Usage.
44. Manipal University Jaipur Lead in Water Conservation Off Campus.
45. AAETI Certificates for Online Training on Water Audit: A tool for water Conservation in Industries.
46. Research Articles
47. Sustainable Development Techniques of Water and Environment Certificate of Appreciation.
48. Department of Water Supply, Sanitation and Environmental Engineering, IHE DELFT Invitation to GSGS Summit in Ahmedabad
49. Invitation to deliver an offline expert session to the Environmental and Civil Engineering students and faculty members at Marwadi University, Rajkot, Gujrat.
50. Report on industry expert seminar on water security and sustainable Infrastructure.
51. Department of Arts, Societal Connect "Cleanliness Awareness Drive".
52. Sustainable Water Extraction at Manipal University Jaipur.
53. Water conservation Facility at MUJ Campus: Through Rainwater Harvesting.
54. Manipal University Jaipur Collaborates with Governments to Ensure Water Security
55. Seminar on World Bamboo Day.
56. Societal Project on Performance appraisal of Low-Cost community based onsite sanitation systems in Ambient Environment of Jaipur City.

Manipal University Jaipur Measuring Water Usage

Water is a finite and essential resource, and universities are among the institutions with a significant demand for it. This demand arises from various sources within the campus, including academic buildings, dormitories, sports facilities, and lush green landscapes. Measuring the total volume of water used in university, along with understanding the sources of this water, is an integral part of sustainable campus management. By implementing metering systems, analyzing data, and adopting eco-friendly practices, Manipal University Jaipur reduces their environmental impact and contributes to a greener and more sustainable future. These efforts not only benefit the environment but also instill a sense of responsibility and environmental awareness in the university community.

Manipal University Jaipur measures its total water usage with precision. Implementing advanced metering systems is one of the primary methods Manipal University Jaipur employs to measure water consumption accurately. These systems track the flow of water in real-time, enabling the university to monitor usage patterns, detect leaks, and identify areas of improvement. The data collected from metering systems are analyzed to gain insights into water consumption trends. By understanding peak usage times and high-demand areas, Manipal University Jaipur develops strategies to optimize water usage efficiently. Manipal University Jaipur has access to groundwater from aquifers. While extracting water from these sources, Manipal University Jaipur adheres to sustainable practices and maintains ecological balance.

Manipal University Jaipur has a clear understanding of its water usage and sources, it implements various sustainable practices to reduce consumption and minimize environmental impact. Installing low-flow faucets, toilets, and showers in campus buildings can significantly reduce water consumption (Picture 1, 2 & 3). Adopting xeriscaping techniques and using drought-resistant plants can lower irrigation needs for campus landscapes (Picture 3). Implementing water reuse systems for activities like irrigation or cooling can maximize water efficiency. Promoting water conservation awareness among students and staff encourages responsible water usage throughout the campus. Regular monitoring and assessment of water usage and sustainability initiatives are crucial to ensure continuous improvement. Universities can set clear goals for water reduction and sustainability and measure progress over time.

Manipal University Jaipur recognizes the importance of measuring and optimizing their water usage, considering the sources from which it is drawn, such as mains supply, desalination, and extraction from rivers, lakes, or aquifers. Manipal University Jaipur measures its water consumption and is taking sustainable actions to ensure a greener campus.



Picture1: Sensor based toilets at MUJ campus



Picture2: Sensor based low faucets in MUJ washrooms



Picture 3: Water reused for drip irrigation



Picture 4: Installation of low-flow faucets, toilets

Water Consumption and Treatment 2021-2022

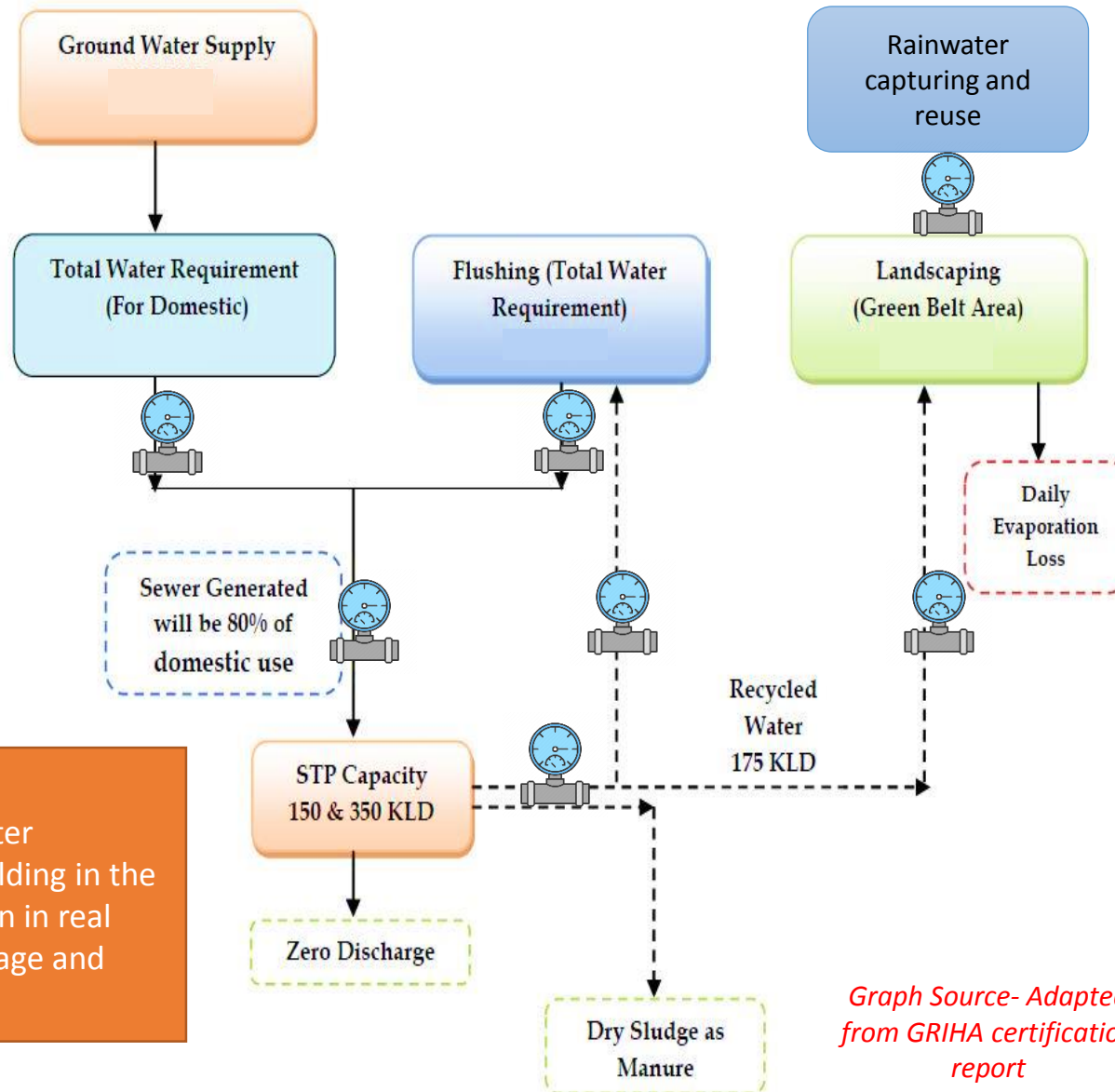
- Manipal University, Jaipur

Water Source and Distribution in MUJ Campus

Manipal university has an Integrated Water management strategies that are designed & implemented for the campus mainly focusing on triple bottom line benefits i.e., social, economic and environmental benefits. This created a flexible, resilient water infrastructure which helped MUJ progress towards water neutrality.

RECOMMENDATIONS -

Water meters to be installed at all water sources/distribution lines at every building in the campus to monitor water consumption in real time basis to understand excessive usage and leaks



Graph Source- Adapted from GRIHA certification report



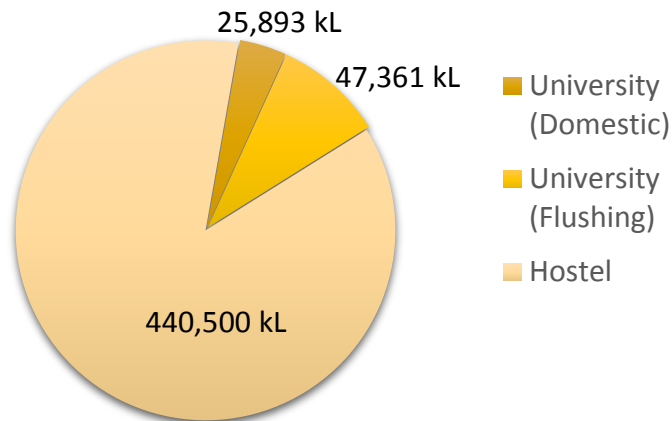
Observations:

The ground water supply water requirement as per the design guidelines for the MUJ university campus is 220 KLD. The Total water requirement is segregated under domestic use, flushing requirement and landscaping irrigation purposes. The domestic purpose requirements gets fulfilled through ground water supply. For flushing and landscaping requirements MUJ uses the treated water from the Sewage Treatment Plant (STP). For landscaping requirements MUJ also use the rainwater from the RWH tanks. The dry sludge from the STP is further converted into manure used for on-site landscaping purpose.

Water Consumption

- ❑ MUJ consumes **25,893 kL/year** of water annually for the university blocks & **440,500 kL/year** for hostel blocks
- ❑ Total water consumption is **513,754 kL/year**
- ❑ 100% wastewater is treated on site and used for flushing and landscape purposes within the campus.

Water Consumption 2020-21



University (Administrative +Academic Blocks) data for domestic and flushing comes is shared by MUJ.

Hostel (Student accommodation + staff accommodation + Guest House) is available from GRIHA report

- To reduce the water usage, all the building toilets in MUJ are equipped with automatic, low flow fixtures and low flush fixtures. These fixtures when compared with conventional fixtures can save significant amount of water.

FIXTURE TYPE	CONVENTIONAL FLOW/ FLUSH FIXTURE FLOW RATE LPF/LPM	FIXTURE FLOW RATES INSTALLED IN MUJ LPF/LPM	Estimated Water Savings (%)
WC Flush	≤ 6 LPF	3 & ≤6 LPF	50%
Sensor Urinals	≤ 3.8 LPF	≤ 0.5 LPF	86%
Restroom Faucets	≤ 9.4 LPM	≤ 2.75 LPM	70%
Pillar cock	≤ 9.4 LPM	≤ 2.75 LPM	70%
Health faucet	≤ 9.4 LPM	≤ 6.4 LPM	32%
Kitchen Faucet	≤ 9.4 LPM	≤ 7.5 LPM	20%

RECOMMENDATIONS-

Regular monitoring of water use at the building level and regular maintenance checks for leaks will ensure additional water savings

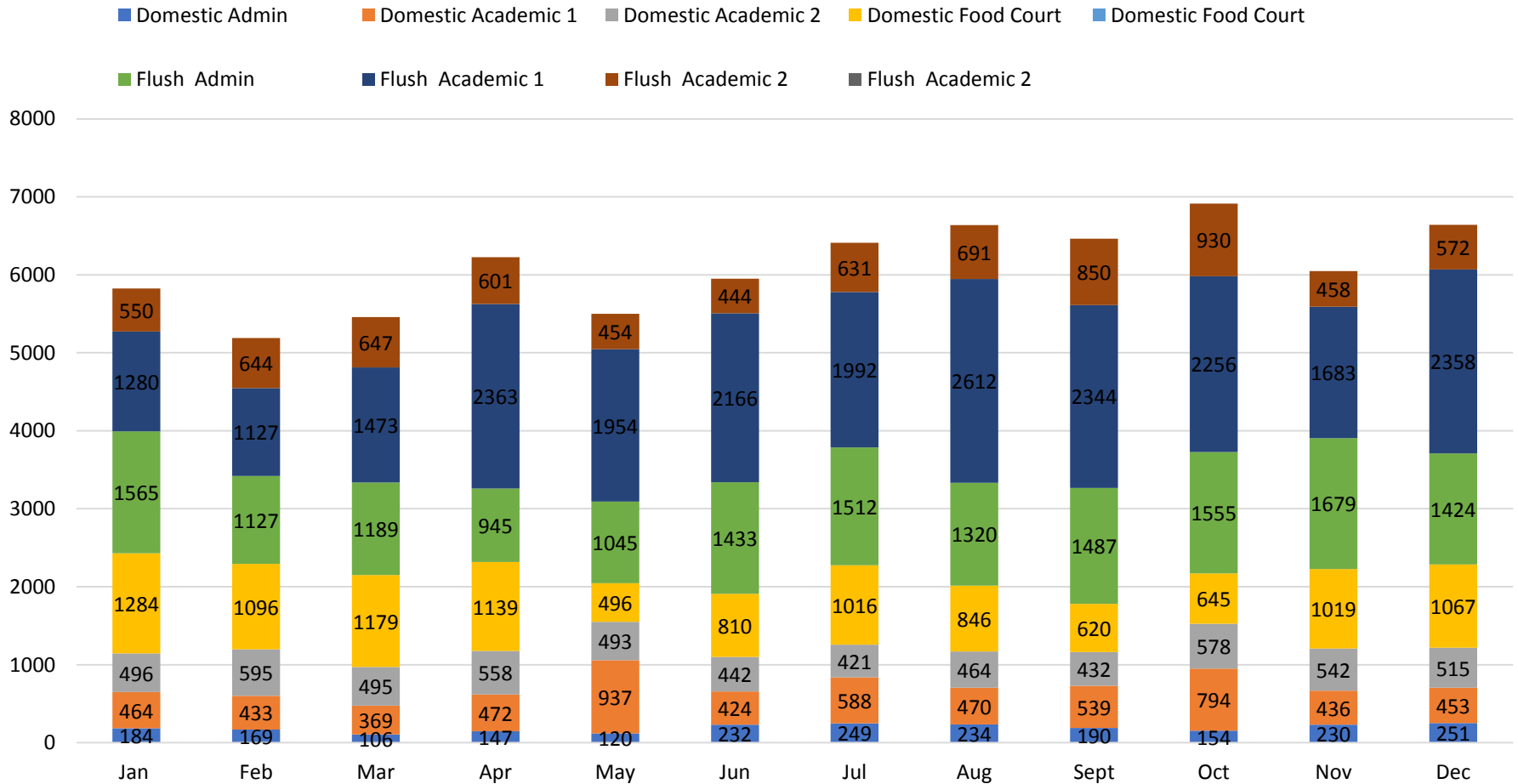


Observations:

The total water consumption in the campus is segregated for domestic and flushing purposes. 80% of waste-water from domestic and flushing purpose is treated and this recycled water is used for landscape irrigation and the dry sludge generated in the sewage treatment plant is used as manure for landscape.

Monthly Water Consumption: Admin, AB-1 and AB-2, Hostels

January 2021 to December 2021 Monthly Water Consumption in KL



Key Performance Indicator (KPI):

“Water Consumption per student per year” of MUJ is

Campus Level:
56.1 kL/Student. Year

University Level:
2.83 kL/Student. Year

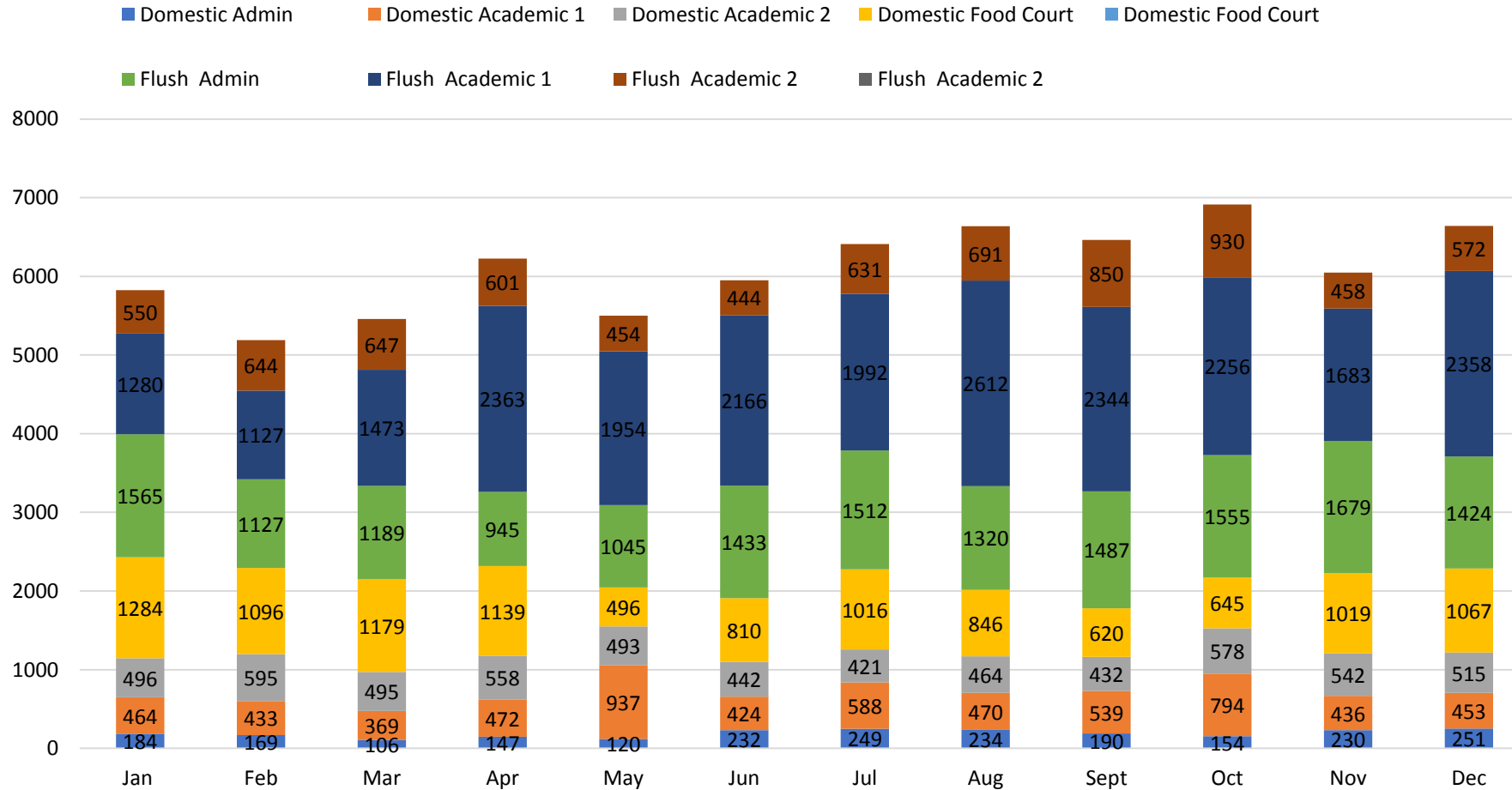
Hostel Level:
88.4 kL/Student. Year

NOTE- From September to December, all the water consumption data is from 2018 as 2019 data was not provided

Monthly water consumption data of Hostel was not available

Monthly Water Consumption: Admin, AB-1 and AB-2, Hostels

January 2019 to December 2019 Monthly Water Consumption in KL



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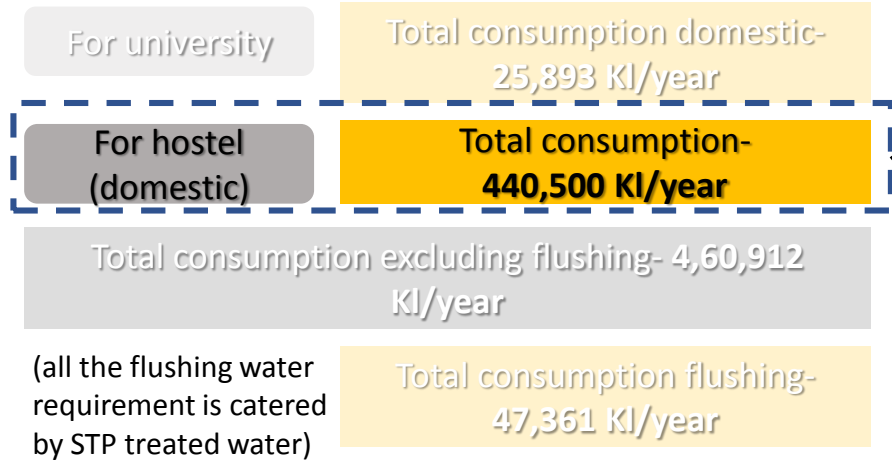
University Level:
2.83 kL/Student. Year

Hostel Level:
88.4 kL/Student. Year

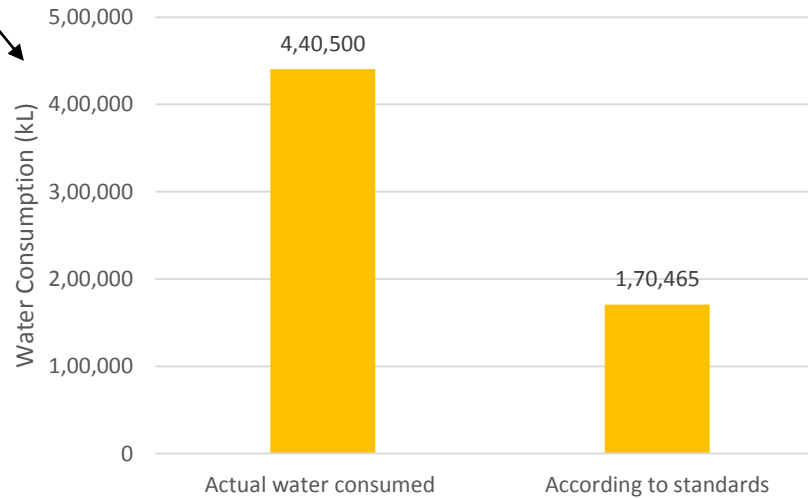
NOTE- From September to December, all the water consumption data is from 2018 as 2019 data was not provided

Monthly water consumption data of Hostel was not available

Water Consumption



Total no of students in hostel in 2021 - 4140
According to NBC,
Water required for domestic purpose is 135 liters per person per day
Estimated water consumption for 305 days of operation is 170,465 kL/year



COST IMPLICATIONS:
Regular monitoring of water use in the buildings can save – 2,70,036 kL
1 litre of water cost – INR 60/kL
Calculated cost savings – 1,62,02,160 INR

HYPOTHESIS -
As the water savings can be upto 61%, there is a merit of investigating further the water consumption in the hostel area. This can be done by active remote monitoring of water consumption at the building level

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Campus Level:
56.1 kL/Student. Year

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Hostel Level:
88.4 kL/Student. Year

Sewage Treatment plant

Manipal University Jaipur has zero discharge waste-water policy. Hence 100% of the wastewater generated on site is treated to tertiary standards and reused within the campus for various purposes like Flushing, **cooling tower makeup**, Horticulture etc.

MUJ has two Sewage treatment plants with **150kLd** and **350 kLd** respectively.

Membrane Bioreactor (MBR) type Sewage Treatment plant with total capacity of **500 kLd** is commissioned at MUJ university campus considering the future developments & excess wastewater from hostels.

A standalone 350 kLd Sewage Treatment plant is commissioned to serve only the Hostel blocks, excess wastewater is sent to University STP.

Wastewater treated on site will have projected water quality standards meeting Central Pollution Control Board (CPCB) norms.



Observations:

- Annually **1,14,609 kl/year** of treated water is available for flushing and landscape uses in MUJ Academic side
- 30,726 kl/year** i.e. **26.7%** of total available treated wastewater is used for non potable uses in all the buildings.
- 83,883 kl/ year** i.e. **73.3%** of total available treated wastewater is used for landscape requirement in university campus.

HYPOTHESIS-

If the treated water used for landscape can be reduced by 10-15% then this water can be used for flushing purpose as the 2019 water consumption was flushing is not 100% catered by treated water.

Annual Rainwater Potential

Annual rainfall is the sum of daily rainfall, that is collected from building roof area. With this calculation we understand the potential usage of this collected water that can be used for irrigation and flushing purpose. The table explains the effective harvesting possibilities.



**Source:

Surface areas – Provided by MUJ

Rainwater tank sizes – GRIHA report

Rainfall data - <https://en.climate-data.org/asia/india/rajasthan/jaipur-3888/#climate-graph>

NAME	ROOF AREA (sqm) - X	RUNOFF COeF. - Y	ANNUAL RAINFALL (m) -Z	Effective Harvesting Potential (m ³)- (X*Y*Z)
Admin block	6860	0.95	0.536	3,493
Mess block	5185	0.95	0.536	26,402
AB_1 block	7814	0.95	0.536	3,978
Garden Lawn	3571	0.2	0.536	382
AB_2 block	8565	0.95	0.536	4,361
Garden	3517	0.2	0.536	377
Road	15567	0.95	0.536	7,926
Total (in kL)				23,160

536 mm is the annual rainfall. The driest month is December. There is 3 mm | 0.1 inch of precipitation in December. Most of the precipitation here falls in July, averaging 178 mm | 7.0 inch.

The peak rainfall months (July & August) harvesting potential is 7700 kL (i.e. 256kLd).



Observations:

- Rainwater holding capacity at MUJ **Hostel blocks 670 kL & University blocks is 490 kL**
- Rainwater from roofs is collected on site in the rainwater harvesting tanks and used for irrigation purposes in the MUJ campus.
- Rainwater from different areas on site is conveyed to RWH tanks through channels.

Hypothesis & Recommendations: The RWH tanks currently used for harvesting the rain water are **not sufficient** to hold the peak demand of rainfall, which is around **7700 kL** for peak rainfall month (i.e. **256 kL/day**). It is important to **increase the harvesting capacity of RWH** tanks to catch the surplus rainwater and utilize it for domestic/ potable purposes in the university campus.

Storm Water Harvesting Potential

Storm water harvesting is the sum of daily rainfall, that is collected from the ground area. With this calculation we understand the potential usage of this collected water that can be used for irrigation and flushing purpose or ground water recharge. The table explains the effective harvesting possibilities.

Surfaces	GROUND AREA (sqm) - X	RUNOFF COEFFICIE NT - Y	ANNUAL RAINFALL (m) -Z	Effective Harvesting Potential (m3- (X*Y*Z)
Granite Flooring	2,381	0.95	0.536	1,212
Road Median	568	0.25	0.536	76
Lawn	14,818	0.2	0.536	1,588
Football ground	10,392	0.35	0.536	1,949
Cricket Ground	16,286	0.35	0.536	3,055
Open Area (batching plant)	15,544	0.5	0.536	4,165
Open area Thadi	16,912	0.5	0.536	4,532
Open area behind basketball ground	17,445	0.25	0.536	2,337
Lawn area near admin block	4,663	0.2	0.536	499
Area under dense tree plantation (No. of trees- 126	23,233	0.25	0.536	3,113
Pathway Area	3,658	0.95	0.536	1,862
Total (in KL)				24,393



Observations:

Storm water from the site is collected in swales. Part of this water is diverted to a collection tank that also works as a sedimentation pit. The rest of the stormwater is diverted to 3 recharge pits located in the lowest part of the site. The collection tank is in turn connected to the WTP. The swales reduce the rate of flow during conveyance and allow stormwater to percolate into the ground as it reaches the recharge pits.

HYPOTHESIS-

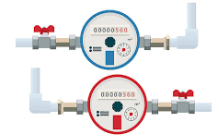
There is good scope to collect water and store. Currently, MUJ is collecting water from 35% of its surfaces (roof top and open areas). Considering that Jaipur faces water scarcity due its climate, investing in water harvesting measures will be beneficial lead to cost savings of ~ INR 14,63,580 annually.

536 mm** annual rainfall

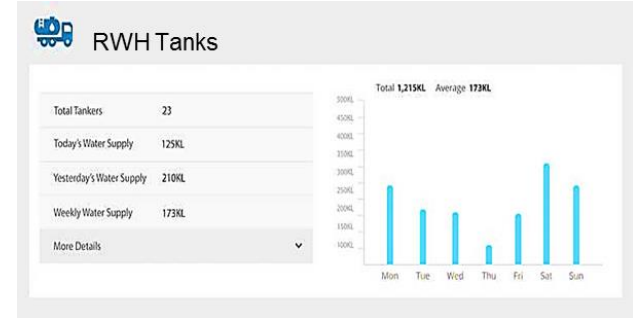
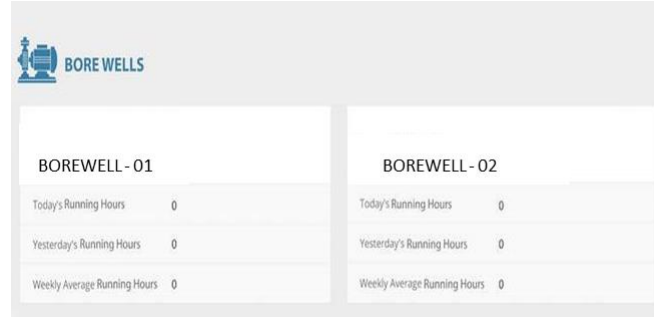
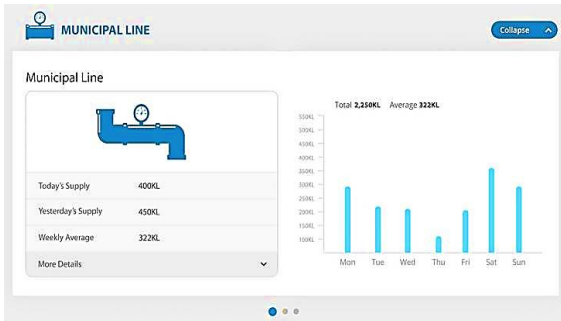
**Source: <https://en.climate-data.org/asia/india/rajasthan/jaipur-3888/#climate-graph>

Recommendations:

Following recommendations are suggested to manage water in a sustainable manner:

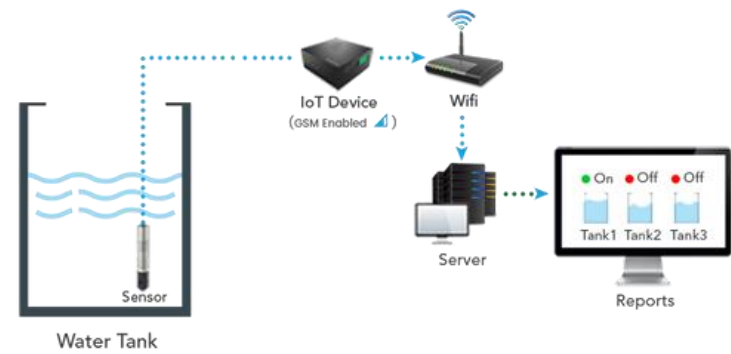
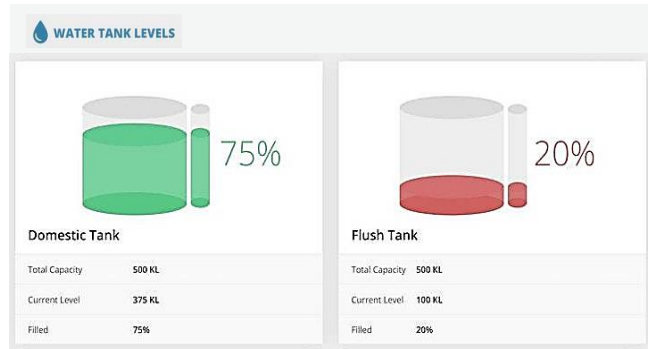


Consider carrying out meter readings on a regular basis (e.g. bi-monthly) or through remote monitoring system in order to monitor water usage. Not only will this make checking water bills much easier but will also allow a baseline to be set from which further reductions can be measured, as well as identifying the possibility to any leaks.

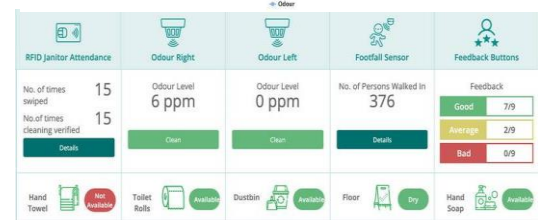
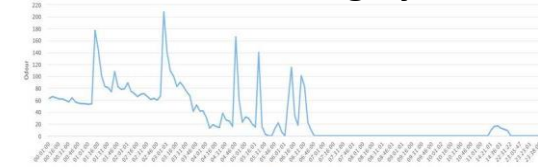


Investigate the feasibility of sub-metering different areas of the buildings and blocks, in order to give a more accurate picture of water use.

It would be useful to digitalise the tank level in the rainwater harvesting tanks to optimally use the captured rain-water.



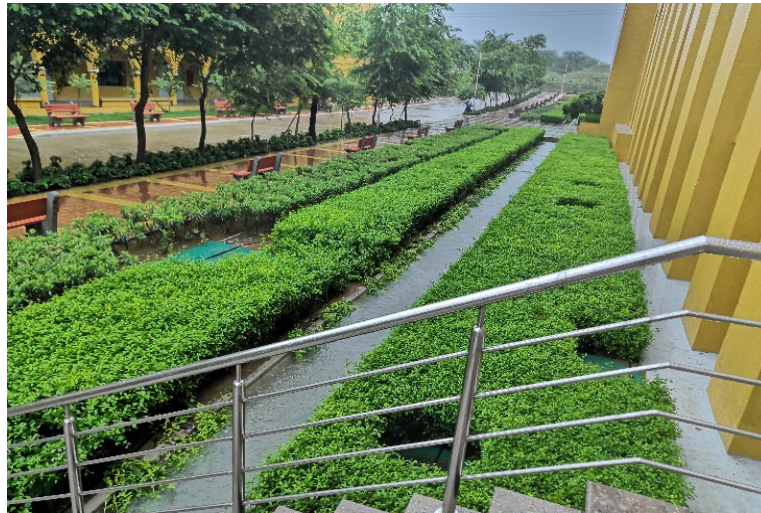
Water Monitoring Systems:



Consider installing spray taps or water-saving cartridges in sinks that are still to be refurbished.



USAGE OF RECYCLE WATER



- Zero Water Discharge Campus (Water Recycling)
- Sludge From STP Used As Manure For Landscaping. Reusing the debris waste for the pathways and road areas base compaction
- Vehicle Washing
- Gardening and Horticulture

WATER EFFICIENT APPLIANCES

Water Aerator Installed in all



Sensor Based Urinals



Drip Irrigation





WATER USE REDUCTION WITH WATER EFFICIENT FIXTURES:

Manipal University Jaipur has implemented dual plumbing for all its buildings, this helps in efficiently separating the potable water from reclaimed water for building use.

- To reduce the water usage, all the building toilets in MUJ are equipped with automatic, low flow fixtures and low flush fixtures. These fixtures when compared with conventional fixtures, low flow fixtures can save significant amount of water.
- 100% wastewater is treated on site and used for flushing purposes within the building .
- Regular monitoring of water use in the building and regular maintenance checks for leaks

FIXTURE TYPE	CONVENTIONAL FLOW/FLUSH FIXTURE(base case) FLOW RATE LPF/LPM	FIXTURE FLOW RATES INSTALLED IN MUJ (design case) LPF/LPM
WC Flush	≤ 6 LPF	3 & ≤6 LPF
Sensor Urinals	≤ 3.8 LPF	≤ 0.5 LPF
Restroom Faucets	≤ 9.4 LPM	≤ 2.75 LPM
Pillar cock	≤ 9.4 LPM	≤ 2.75 LPM
Health faucet	≤ 9.4 LPM	≤ 6.4 LPM
Kitchen Faucet	≤ 9.4 LPM	≤ 7.5 LPM

Some of the key highlights of sustainable water management at MUJ:

- Potable water use reduction by using water efficient fixtures
- Recycling 100% of waste water generated on site and reuse on site.
- Use of treated water for non-potable water requirement
- Reduction in landscape water use by choosing right species of plants which are regional and adaptable to local conditions & reduction of turf areas
- Use of Highly efficient Irrigation equipment like micro drips for landscape needs
- A well-developed stormwater management infrastructure to capture and use rainwater for both building and landscape needs

Manipal University Jaipur Wastewater Treatment

In their pursuit of sustainability and responsible resource management, Manipal University Jaipur has implemented wastewater treatment processes. Manipal University Jaipur has developed and integrated wastewater treatment systems into their operations, turning wastewater into a valuable resource. Wastewater, often generated from various campus activities, contains contaminants that can harm the environment if not treated properly. These contaminants include organic matter, chemicals, and pathogens. Treating wastewater before discharge helps safeguard local ecosystems and water bodies, preventing pollution and the negative impact on aquatic life. Treated wastewater can be repurposed for non-potable uses like irrigation, cooling systems, or flushing toilets, reducing the demand on freshwater resources.

Wastewater Treatment Processes

Manipal University Jaipur employs a range of wastewater treatment processes.

Primary Treatment

This initial stage involves physical processes like screening and settling to remove large particles and solids from the wastewater.

Secondary Treatment

Here, biological processes are employed to break down organic matter and remove nutrients like nitrogen and phosphorus. Activated sludge and aerobic digestion are commonly used methods.

Tertiary Treatment

In this advanced stage, additional filtration or chemical processes further purify the water, making it suitable for reuse in non-potable applications.

Disinfection

Before discharge or reuse, wastewater is often disinfected to eliminate harmful pathogens. Chlorination, ultraviolet (UV) treatment, or ozonation are common disinfection methods.

Manipal University Jaipur employs necessary infrastructure, including treatment plants, pipelines, and storage facilities, tailored to the institution's size and needs. Manipal University Jaipur explores innovative technologies like membrane bioreactors and water recycling systems to improve treatment efficiency and water quality. Treated wastewater is utilized for various purposes, such as landscape irrigation, cooling towers, and even toilet flushing. Implementing dual plumbing systems to distribute treated water is a common approach. Implementing wastewater treatment processes offers multiple sustainability benefits for the university. By reusing treated wastewater, Manipal University Jaipur reduces its reliance on freshwater sources, contributing to water conservation efforts. Proper wastewater treatment minimizes the release of harmful pollutants into the environment, helping maintain ecological balance. Wastewater treatment is an essential component of a university's commitment to sustainability and environmental responsibility.



LIQUID WASTE MANAGEMENT-INHOUSE- SEWAGE TREATMENT PLANT

MUJ is equipped with **4 STP** Plants with different capacity 1000 KLD, 350 KLD(two) and 150 KLD **IN TOTAL 1850 KLD**. Sewage treatment removes contaminants from wastewater, which includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safer treated water (it has been used for flushing and gardening). In normalcy are producing 1850KL treated water per day.





**MANIPAL UNIVERSITY
JAIPUR**

(University under Section 2(f) of the UGC Act)

LIQUID WASTE MANAGEMENT-INHOUSE- SEWAGE TREATMENT PLANT



Rainwater harvesting- water canals in campus



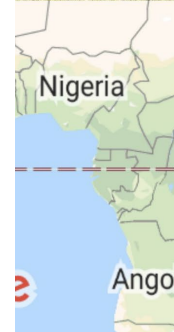
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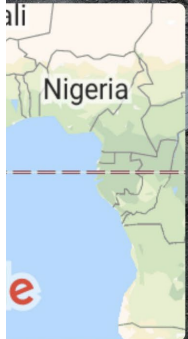


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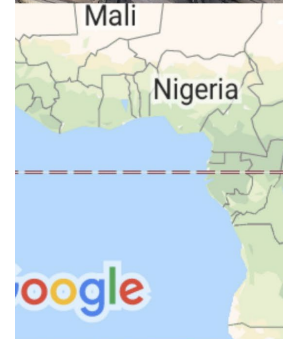
More than 14 KM of Water Canals in University for water harvesting



Poen well recharges through Ponds

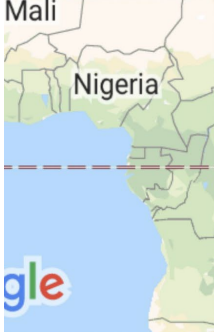


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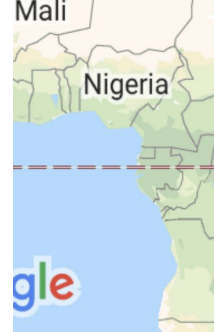


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Construction of Ponds



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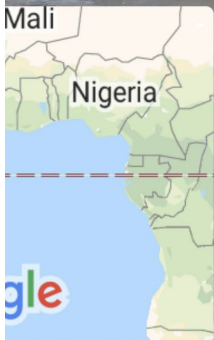


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Water Treatment Plants



Water Treatment Plants



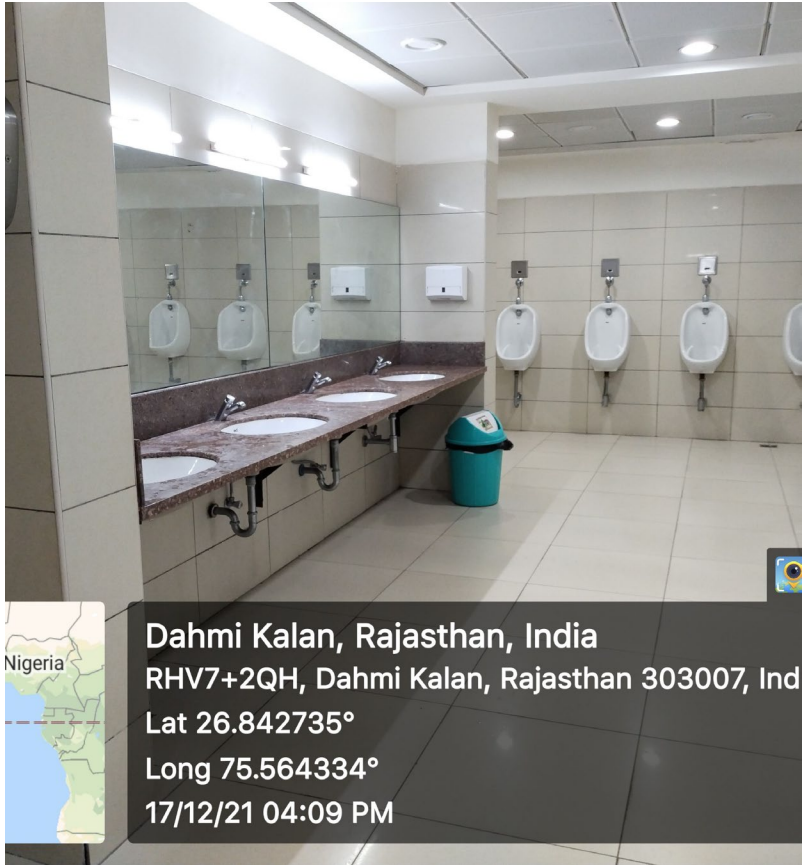
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Water distribution System





Sensor Based Water Conservation



Water Aerator Installed in all



Drip Irrigation

Manipal University Jaipur's Processes to Prevent Water Pollution

Clean and safe water is a fundamental necessity for human health and the environment. Manipal University Jaipur, as centers of education and innovation, have a responsibility to protect and preserve its surrounding ecosystems and communities. One crucial aspect of this responsibility is to prevent polluted water from entering the water system, including pollution caused by accidents and incidents at the university.

One of the primary steps Manipal University Jaipur takes is to ensure it complies with all environmental regulations and standards set by local, state, and federal authorities. This includes obtaining permits and licenses that govern water discharges and pollution prevention. Manipal University Jaipur regularly monitors its activities to ensure that they do not exceed established pollution limits. Universities often deal with various hazardous materials, including chemicals used in laboratories and maintenance activities. To prevent these substances from contaminating water sources, Manipal University Jaipur has strict protocols for handling, storage, and disposal. Hazardous waste is typically collected and disposed of in accordance with environmental regulations. Stormwater runoff can carry pollutants into local water bodies. Manipal University Jaipur implemented comprehensive stormwater management plans to control and treat runoff. This includes installing retention basins, using permeable surfaces, and employing filtration systems to remove contaminants before they can reach nearby rivers or lakes. Accidents can happen, and universities need to be prepared to respond swiftly to prevent pollutants from reaching water systems, Manipal University Jaipur has well-defined spill response plans in place, outlining the steps to contain, clean up, and report spills of hazardous materials. Training programs ensure that staff and students are knowledgeable about these procedures. Manipal University Jaipur has extensive green spaces. Implementing sustainable landscaping practices can significantly reduce water pollution risks. This includes using native plants that require fewer chemicals and fertilizers, practicing responsible irrigation, and minimizing pesticide use. The university generates wastewater from various sources, including laboratories, restrooms, and dining facilities. To ensure that this wastewater is treated properly, Manipal University Jaipur operates on-site treatment facilities. These facilities are designed to remove contaminants and meet stringent water quality standards before discharging the treated water.

Through compliance with environmental regulations, responsible management of hazardous materials, effective stormwater control, spill response plans, sustainable landscaping, wastewater treatment, research and innovation, and community engagement, Manipal University Jaipur is taking significant steps to prevent polluted water from entering the water system.

PREVENTION OF
WATER POLLUTION
AT MANIPAL
UNIVERSITY
JAIPUR



MANIPAL UNIVERSITY
JAIPUR

(University under Section 2(f) of the UGC Act)



CLEAN AND SMART CAMPUS

- Solar Power Plant of 2.3 MWp is installed on roof-top of the buildings, Ground Mounted and parking shed in the Campus - one of the largest roof-top Solar Power Plant in India for any Private University.
- The University is a '**Zero Discharge Campus**', with Rain Water Harvesting, Waste water recycling and reuse and Ground Water recharging in place. Water conservation through campus wide drains and ponds for water collection.
- Sewage treatment plants on both sides of the campus.
- Campus greening through extensive tree plantation.
- The University has a Bio-Gas generation system using Kitchen waste, producing 30kg of Gas per day with 500 kg of Kitchen waste.
- All buildings are optimally designed to maximize daylight and minimize heat gains.
- Digital Campus



**MANIPAL UNIVERSITY
JAIPUR**

(University under Section 2(f) of the UGC Act)

SOLID WASTE MANAGEMENT- Segregation & Collection at Source



Solid waste Generation Data



**MANIPAL UNIVERSITY
JAIPUR**

(University under Section 2(f) of the UGC Act)

MEDICAL WASTE SEGREGATION MANAGEMENT



SOLID KITCHEN WASTE MANAGEMENT

Collection frequency & clearance: Twice a day

Time: 9:00 AM & 4:00 PM

Sr.No.	Department/ Area of source of waste (Every point of waste generation within the campus should be identified and listed - cross)	Types of waste generated in each of the point source (for each type of waste, use separate row)						Dry (in kgs/ day)
		Food wastage	Paper/Card board	Plastic	Wood	Glass	Metal	
Mar-19	MUJ Academic Blocks		6790	65	60		120	7035
Mar-19	MUJ HOSTEL Blocks	4279						
Apr-19	MUJ Academic Blocks		92	33	44	0	20	189
Apr-19	MUJ HOSTEL Blocks	3689					940	940
May-19	MUJ Academic Blocks		73	28	31	2	17	151
May-19	MUJ HOSTEL Blocks	2452		591			860	1451
Jun-19	MUJ Academic Blocks		68	25	31	1	17	142
Jun-19	MUJ HOSTEL Blocks	1160					700	700
Jul-19	MUJ Academic Blocks		85	36	45	0	26	192
Jul-19	MUJ HOSTEL Blocks	4638					240	240
Aug-19	MUJ Academic Blocks		101	40	47	0	29	217
Aug-19	MUJ HOSTEL Blocks	4596		260			380	640
Sep-19	MUJ Academic Blocks		97	30	62	1	37	227
Sep-19	MUJ HOSTEL Blocks	2839						
Oct-19	MUJ Academic Blocks		170	95	92	0	82	357
Oct-19	MUJ HOSTEL Blocks	4799						
Nov-19	MUJ Academic Blocks		66	55	71	0	75	192
Nov-19	MUJ HOSTEL Blocks	4155						
Dec-19	MUJ Academic Blocks		81	58	48	0	45	187
Dec-19	MUJ HOSTEL Blocks	2033						
Jan-20	MUJ Academic Blocks		112	62	51	0	76	225
Jan-20	MUJ HOSTEL Blocks	6195						
Feb-20	MUJ Academic Blocks		73	70	51	8	82	202
Feb-20	MUJ HOSTEL Blocks	6178						
Mar-20	MUJ Academic Blocks		55	50	46	8	49	159
Mar-20	MUJ HOSTEL Blocks	5159						
Apr-20	MUJ Academic Blocks		23	17	26	2	17	68
Apr-20	MUJ HOSTEL Blocks	NIL						
May-20	MUJ Academic Blocks		40	46	35	5	41	126
Jun-20	MUJ Academic Blocks		38	35	24	3	42	100
Jul-20	MUJ Academic Blocks		43	33	33	6	59	115
Aug-20	MUJ Academic Blocks		20	21	31	3	26	75
Sep-20	MUJ Academic Blocks		27	16	22	6	41	71





**MANIPAL UNIVERSITY
JAIPUR**

(University under Section 2(f) of the UGC Act)

Clean And Smart Campus 2021

HUMAN RESOURCE FOR WASTE MANAGEMENT



HOUSEKEEPING and SUPPORT STAFF AT MUJ



GREEN CLUB @ MUJ since 2012

The Green Club of Manipal University Jaipur has been an active social and environment fruition club since 2012 and has continued to aid a helping hand for the benefactor factor of the environment. Since its inception, the club has motivated the students or the Y-Generation and faculty members to take initiative about the environment that we subsist in which sorrowfully is under rapid depletion. From social awareness, technical solutions, to more evident clean drives and plantation, the club has been working extensively on such projects and pioneers path breaking ideas for the future.



➤ [Green Club Report \(click here\)](#)

T44 Gulmohar *Fabaceae*

Planted by - Shri Purushottam Agarwal
Year of Plantation - 2014
Family- Leguminosae - Leguminosae

Nature - Deciduous
Climate - Temperate and tropical
Texture of leaf - wrinkled/pulvini
Shape & Colour of leaf - Range from pinnately or palmately compound to simple, green
Foliage of tree - Dense
Soil Type - soil that is above freezing temperatures and offers enough warmth
Height of tree - 10-15m
Diameter of trunk - 2 inches
Region - predominant outside the tropics

Uses
- Anti-diabetic activity
- To treat polymenorrhoea, anemia, ulcers and menorrhagia (during pregnancy).
- In the treatment of diarrhoea, in overcoming the protein deficiency Kwashiorkor and can also impact hypocholesterolaemic conditions, and thyroxine-induced hyperglycaemia.







T43 Kadamb *Neolamarckia cadamba*

Planted by - Smt. Vasanti Pai
Year of Plantation - 2012
Family- Madder family

Nature - Evergreen
Climate - Tropical
Shape & Colour - Flowers: flowers are sweetly fragrant, red to orange in colour, occurring in dense
Foliage of tree - broad crown and straight cylindrical bole
Soil Type - it grows well in deep moist alluvial soils, often along river banks.
Height of tree - up to 45 m
Diameter of trunk - 100cm
Region - South and Southeast asia

Uses
- Low-grade timber and paper
- Timber is used for plywood and light construction.

Southeast Asia






T10 Saat Patti *Alstonia scholaris*

Planted by - Dr. Ajay Kumar
Year of Plantation - 21st March 2012
Family- Apocynaceae

Nature - Evergreen
Climate - Tropical
Leaf Texture - Glossy & Greyish
Leaf Shape & Colour - Flattened roots similar to buttresses.
Foliage Shape - Slightly round.
Soil Type - Red Alluvial
Tree Height - 20-40 mts.
Bark Diameter - 100-200cms.
Region - Malaysia Pakistan

Uses
- Alstonia scholaris has been used in different system of traditional medication for the treatment of diseases.
- The wood of Alstonia scholaris has been recommended for the manufacture of pencils.
- Wood close to the root is very light and of white color, and is used for net floats, household utensils, trenchers, corks, etc.
- Used for landscape purpose.

Southern China, Tropical Asia and Australasia










T19 Bottle Brush *Callistemon*

Planted by - D.S.Chauhan
Year of Plantation - 18-01-2017
Family- Myrtle

Nature - Evergreen
Climate - Temperate regions
Texture of flower - Fury
Shape & Colour - Flower: Red flower spikes
Foliage of tree - Crown is rounded
Soil Type - Well-drained, sandy soil.
Also grow in clay or loam
Height of tree - 10-15 ft
Diameter of tree - 10 to 15m
Region - Western North America and in colder regions in greenhouses

Uses
- Ornamental landscaping
- Common remedies for treatment of diarrhoea, dysentery and rheumatism

Australia

T15 Maulsari *Minusops elengi*

Planted by - Ms Krishna Poonia
Year of Plantation - 18-01-2017
Family- Sapotaceae (Mahua family)

Nature - Evergreen
Climate - Summer season
Shape & Colour - Bark: Thick bark and appears dark brown in color
Foliage of tree - Glossy, dark green leaves
Soil Type - Rich free draining loamy and sandy soil with PH of 5.5-6.5
Height of tree - 9-18 m (30-59 ft)
Diameter of trunk - 1m (3ft 3in)
Region - Tropical forest in South Asia, Southeast Asia and northern Australia

Uses
- Treatment and maintenance of oral hygiene
- Rinsing mouth with water solution made with bakal helps in strengthening the teeth
- Prevents bad breath
- Keeps gums healthy

South Asia






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Uses
- Ornamental landscaping
- Common remedies for treatment of diarrhoea, dysentery and rheumatism

Australia










T40 Rugtoora *Spathodea campanulata*

Planted by - Shri N.R Narayan Murthi
Year of Plantation - 2018
Family- Bignoniaceae

Nature - Deciduous
Climate - Cooler tropical climate
Shape & Colour - Bark: when young is pale grey brown and smooth which turns to grey-black.
Foliage of tree - Compact, round crown of dense and dark green foliage
Height of the tree - 7-25 m
Region - West coast from Guinea to Angola, and inland across the tropical rainforest region to southern Sudan and Uganda

Uses
- Cure rashes and inflamed skin,
- Lower blood sugar levels.
- Treat ulcers,
- Treat diabetes,
- Cure glaucoma

Tropical Africa


T39 Sheesham *Dalbergia sissoo*

Planted by - Shri G.S. Sandhu (IAS)
Year of Plantation - 2014
Family- Leguminosae - Mimosoideae

Nature - Deciduous Tree
Climate - Indian subcontinent and southern Iran
Texture of trunk: are often crooked when grown in the open. Leaves are leathery
Foliage of tree - Round foliage
Soil Type - Soils range from pure sand and gravel to rich alluvium of river banks.
Height of tree - 25 m (82 ft)
Diameter of trunk - 2-3 m
Region - Native to India, Pakistan and Nepal

Uses
- Decoration of leaves is useful in gonorrhoea.
- Wood is alterative, useful in leprosy, boils, eruptions and to allay vomiting.
- The wood is used for making doors, window frames, furniture, especially cabinets and much more.
- The pulp of wood is also used for making papers.

Indian subcontinent






T17 Neem *Azadirachta indica*

Planted by - Dr. Kiran Mazumdar Shan
Year of Plantation - 9th August 2014
Family- Mahogany family, Meliaceae

Nature - Evergreen
Climate - Tropical & Semi-Tropical Region
Leaf Texture - Mildly soft
Leaf Shape & Colour - Long medium to dark green
Foliage Shape - Round
Soil Type - All types
Tree Height - 15 to 20 mts.
Bark Diameter - 30-80 cms.
Region - Burma, Iran, India and Pakistan

Uses
- The neem tree is noted for its draught resistance. It can grow in many different type of soil.
- Dried neem leaves prevents insects from eating clothes and can also be used in storing rice.
- The flowers and the shoot are eaten as a vegetable.
- Products made from neem tree can be used as medicine.
- Neem is a key ingredient in pesticides.

Indian sub continent






T24 Ashoka *Saraca asoca*

Planted by - Shri J.C.Mohanty
Year of Plantation - 18-01-2017
Family- Legumes

Nature - Evergreen
Climate - Rain-forest tree. Central areas of Deccan plateau
Texture of Bark: Warty surface
Shape & Colour - Leaf: Green colored leaves with oblong shape.
Foliage of tree: Shiny foliage
Height of the tree - 10-15' tall
Diameter of trunk: 3m
Region - Central areas of the Deccan plateau

Uses
- Reduces acne, pimple
- Very useful in gynaecological conditions
- Boosts memory power
- Beneficial in diabetes

Indo-Malaysian and Sri Lanka










T42 Bargad *Ficus benghalensis*

Planted by - Dr. Ramdas M. Pai
Year of Plantation - 21-03-2012
Family- Moraceae

Nature - Evergreen
Climate - Monsoon and rain forests
Texture of leaf - leathery
Shape & Colour - Heart and green
Foliage of tree - Round Foliage
Soil Type - High moisture
Height of tree - up to 30m (100 ft)
Diameter of trunk - spreads laterally indefinitely
Region - south eastern region of India

Uses
- Boosts immunity
- Prevents depression
- Treats vomiting
- Lowers cholesterol
- Prevents inflammation

Indian subcontinent





T8 Peela Gulmohar *Petrophorum pterocarpum*

Planted by - Dr. D. Srikanth Rao
Year of Plantation - 21st march, 2012
Family- Legumes

Nature - Deciduous
Climate - Tropical warm climate
Leaf Texture - Fern like leaves
Leaf Shape & Colour - Rusty red tomentose.
Foliage Shape - Round
Soil Type - moist, but well drained soil.
Tree Height - Approx. 10 mts.
Bark Diameter - 20-25 mts.
Region - Sri Lanka, the Andamans & Australia

Uses
- Gulmohar is well known for its beautiful flowers.
- It also has some medicinal properties like Anti-diabetic activity, Anti-bacterial activity, Anti-diarrheal property, Hepatoprotective/Cytotoxic property, Anti-microbial activity, Anti-inflammatory activity

Tropical south-eastern asia

T6 Karanja *Millettia pinnata*

Indian sub continent & Southeast Asia

Planted by - Shree Abhay Jain

Year of Plantation - 21st March 2012

Family- Fabaceae



Nature - Evergreen
Climate - Humid & Sub Tropical Region

Leaf Texture - Soft & Shiny

Leaf Shape & Colour - Round & Glossy

Deep Green

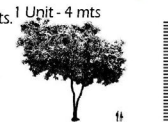
Foliage Shape - Round
Soil Type -Sandy stony & clayey

Leaf type- Pinnate

Tree Height - 15 to 25 mts.

Bark Diameter - 50 cms.

Region - Temperate Asia, Australia



Uses

- It is used for landscaping purpuss due to large canopy & snowy fragrant flowers.
- The bark can be used to treat wounds caused by poisonous fish.
- The fruits & sprouts are used in many traditional remedies.
- Its oil known as Pongamia oil is used in soap making & as a lubricant.
- The residue of oil extraction is used as a fertilizer.

T45 Kachnar *Bauhinia variegata*

Eastern Africa

Planted by - Shri Sunil Arora

Year of Plantation - 16-04-2012

Family- Leguminosae - Legumes



Nature - Deciduous

Climate- The desert/desert terrain plain of Western or Eastern Ghats. Plateaus, plains of Ganges, Doab Punjab, eastern ranges, north east zone, high altitudes.

Shape & Colour of tree - Twigs of tree are slender, light green, angled, hairy and brownish grey in colour.

Foliage of tree -Spreading crown and a short bole.

Soil Type - Acid and Neutral

15 M

Uses

- Treat hypothyroidism
- Controls blood sugar
- Treatment of digestive system problems



Zoomed Image



Leaf type



Flower type



T9 Jamun *Eugenia jambolama*

Indian sub continen

Planted by - Brig(Dr.) P.S.Siwach(Retd.)

Year of Plantation - 21st March 2012

Family- Myrtaceae



Nature - Evergreen

Climate - Tropical & Sub Tropical Region

Leaf Texture - Smooth, Leathery

Leaf Shape & Colour - Glossy

Dark Green,Long with Pointy tips

Foliage Shape - Round

Soil Type - Deep Loamy

Tree Height - 30 mts.

Bark Diameter - 40-100 cms

Region - India, Myanmar & Srilanka



Leaf type- Pinnate

1 Unit - 5 mts



Uses

- Jambolan fruits can be eaten raw or are made into jams.
- Fruits have great nutritional value.
- Jambolan is used in medicine for diabetes, swelling of the stomach, constipation, diarrhea & other conditions.
- Jamun fruit is used in treating common cold, cough & flu.
- Jamun fruit helps in regulating blood pressure.
- The tree bark can be used for decoration.

T15 Maulsari *Minusops elengi*

South Asia

Planted by - Ms Krishna Poonia

Year of Plantation - 18-01-2017

Family- Sapotaceae (Mahua family)



Fruit type

Nature -Evergreen

Climate - Summer season

Shape & Colour - Bark: Thick bark and appears dark brown in color

Foliage of tree - Glossy, dark green leaves

Soil Type -Rich free draining loamy and sandy soil with PH of 5.5-8.5

Height of tree- 9-18 m (30-59 ft)

Diameter of trunk -1m (3ft 3in)

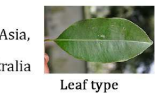
Region - Tropical forest in South Asia, Southeast Asia and northern Australia



Zoomed image



Flower type



Leaf type



Uses

- Treatment and maintenance of oral hygiene
- Rinsing mouth with water solution made with bakul helps in strengthening the teeth
- Prevents bad breath
- Keeps gums healthy



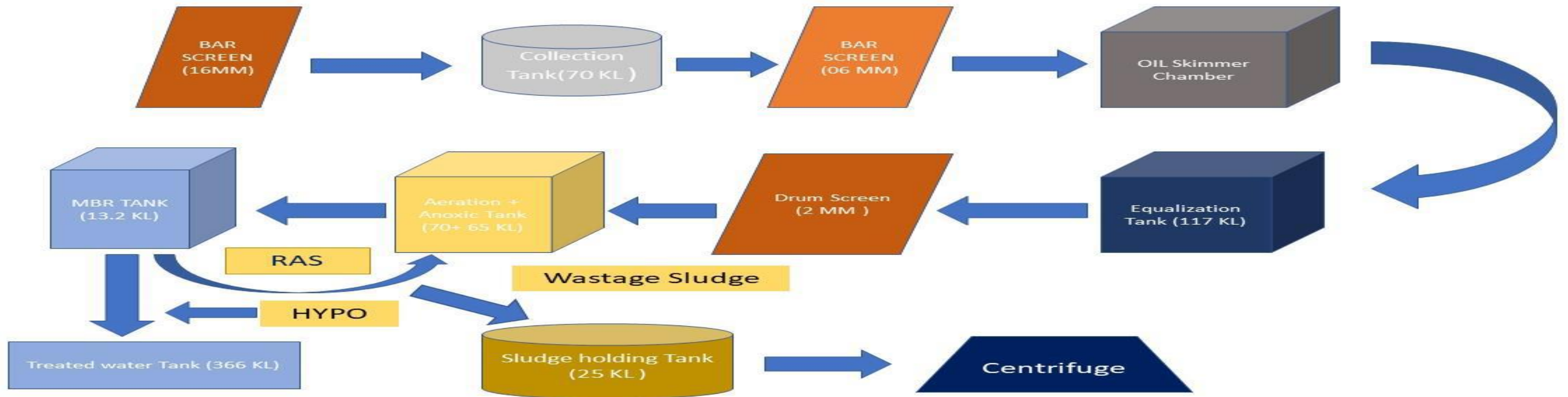
Cleanliness Drive in Dehmi Kalan Jaipur



Cleanliness drive by our housekeeping staff



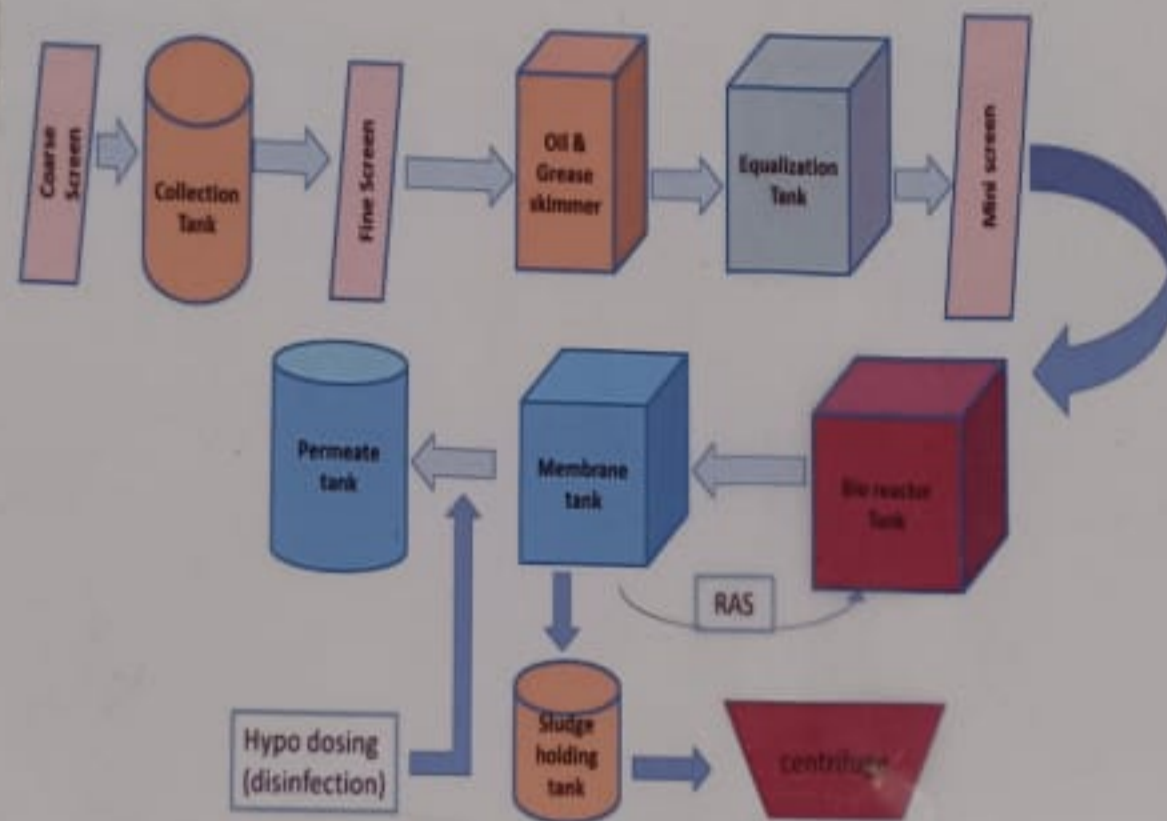
PROCESS FLOW CHART –STP (350 KLD)



Process description of STP plant

1	Coarse Screen: -	Provided to remove screen particles greater than 16 mm.
2	Fine Screen : -	To remove any screen particles greater than 6 mm.
3	Collection Tank: -	To transfer raw sewage to Oil and Grease Skimmer.
4	Oil & Grease skimmer: -	To separate coarse particles and oil & grease respectively.
5	Equalization tank: -	Homogenization of the effluent and feed the flow uniformly in secondary process.
6	Drum Screen / Mini Screen: -	To separate particles greater than 2mm size before entering to Bioreactor.
7	Bioreactor tank: -	Aeration tank is provided with bacterial culture to reduce organic pollutants in presence of oxygen.
8	MBR tanks: -	Provided with Cassettes of membranes to separate water from mix liquid suspended solids.
9	Sludge holding tank: -	Wastage sludge stored in to this tank.
10	Centrifuge: -	Solid liquid separation of sludge.
11	Disinfection: -	HYPO dosing in to treated water discharge line.
12	Permeate tank: -	Treated water stored in this tank to supply for Horticulture & Flushing.

STP – PROCESS FLOW CHART



- **Coarse Screen:** Provided to remove screen particles greater than 16 mm.
- **Fine Screen:** To remove any screen particles greater than 6 mm.
- **Collection Tank:** To transfer raw sewage to Oil and Grease Skimmer.
- **Oil & Grease skimmer:** To separate coarse particles and oil & grease respectively.
- **Equalization tank:** homogenization of the effluent and feed the flow uniformly in secondary process.
- **Mini screen:** To separate particles greater than 2mm size before entering to Bioreactor.

- **Bioreactor tank:** Aeration tank is provided with bacterial culture to reduce organic pollutants in presence of oxygen.
- **MBR tanks:** Provided with Cassettes of membranes to separate water from mix liquid suspended solids.
- **Sludge holding tank:** wastage sludge stored in to this tank.
- **Centrifuge:** Solid liquid separation of sludge.
- **Disinfection:** HYPO dosing in to treated water discharge line.
- **Permeate tank:** treated water stored in this tank.

ACQUIRE SOLUTION ENVIRO ENGINEERS | 07/11/2023

	350KLD	150KLD	UGR	MUJ	FACULTY
T.P.					
H.	7.7	-	P.H.	-	7.5
D.S.	804	-	HARDNESS	-	06
TURBIDITY	-	-	T.D.S.	-	691
PPRO	-0.48	-	TURBIDITY	-	-
LET	230 m ³	-	F.R.C.	-	0.2
T-LET	181 m ³	-	PRODUCTION	-	32 m ³
ERGY, KW	317	06	REG.	-	Done
DGE waste.	-	-			
V-30	950	-			
D.O.	-	-			

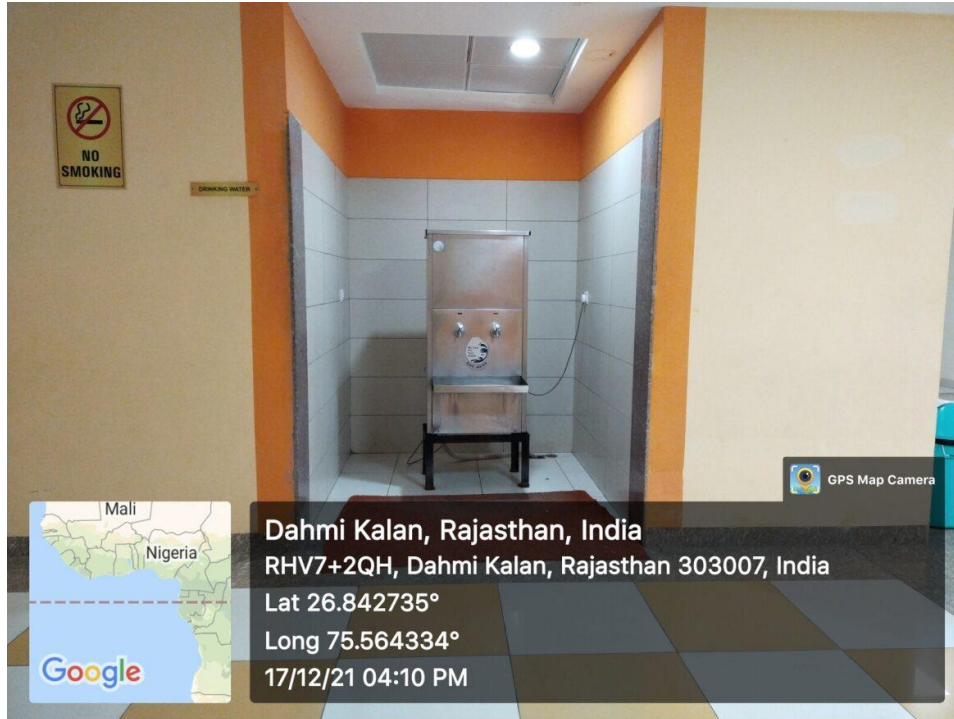
⇒ D.O. Meter Not Calibrate
 ⇒ Tab Meter (N/w)
 ⇒ U.P.S. (N/w) properly

MUJ-UGR = Filter feed Pump N. 1, 2 sent for Maintenance. (25/10/2023)

Manipal University Jaipur Provides Free Drinking Water

In a move that highlights both sustainability and student welfare, Manipal University Jaipur has implemented a groundbreaking initiative by providing free drinking water to its students, staff, and visitors. This progressive step not only promotes a healthier lifestyle but also underscores the university's commitment to environmental responsibility.

The installation of free drinking water stations across the campus is part of Manipal University Jaipur's broader sustainability efforts (Picture 1). By encouraging the use of reusable water bottles and reducing single-use plastic waste, the university is contributing to an eco-friendlier campus environment. The strategically placed water stations ensure that access to clean and safe drinking water is convenient for everyone on campus. Whether you are rushing between classes, attending a lecture, or just strolling through the grounds, you are never far from a hydration station. For students, this initiative offers numerous benefits. Primarily, it promotes a healthier lifestyle by encouraging regular water consumption throughout the day. Proper hydration can improve focus and cognitive function, which can lead to better academic performance. Furthermore, it eases the financial burden on students who might otherwise spend money on bottled water. The reduction of single-use plastic bottles is one of the most significant contributions to sustainability that Manipal University Jaipur hopes to achieve through this initiative. Plastic waste is a global concern, and by eliminating the need for disposable bottles, the university is taking a stand against unnecessary environmental harm. This movie is about the entire university community, including staff and visitors. Providing free water demonstrates that Manipal University Jaipur values the well-being of everyone who steps foot on campus. It creates a welcoming atmosphere for guests and fosters a sense of belonging among staff members. Manipal University Jaipur's decision to provide free drinking water serves as an inspiration to other educational institutions and organizations (Picture 3 & 4) It showcases the positive impact that a simple, yet effective change can have on both the environment and the well-being of the community. Manipal University Jaipur's commitment to providing free drinking water for students, staff, and visitors is a testament to its dedication to sustainability and the welfare of its community (Picture 2). As more institutions follow suit Manipal University Jaipur looks forward to a future where clean, safe drinking water is readily accessible to all, and where the use of single-use plastic bottles becomes a thing of the past (Annexure 1 & 2). This initiative exemplifies the positive change that can be achieved when universities take a leadership role in addressing pressing societal and environmental issues.



Picture 1: Water Coolers installed in the Academic Block at MUJ Campus



Picture 2: Free Water Coolers installed in neighboring schools



Picture 3: Water coolers installed in MUJ Hostel



Picture 4: Free water facility in Academic Block at MUJ Campus



Picture 5: Water Station installed in the food mess



Picture 6: water Facility available for visitors and workers in MUJ Campus

Water Cooler (Monthly)

Sr No	Work Description	Floor	Zone / Wing				Name of HK Assistant	Name of HK Supervisor	Sign
			1	2	3	4			
1	Drain the water from cooler and tank to be cleaned with water from inside.	Gr	✓	✓			geema	[Signature]	[Signature]
2	Outside body cleaning		✓	✓			mayu		
3	Tap / Tray / Stand cleaning		✓	✓					
4	Pantry floor / drain cleaning		✓	✓					

Sr No	Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
			1	2	3	4			
1	Water Cooler inside cleaning (after water clearance)	1st	✓	✓			[Signature]	[Signature]	
2	Outside body cleaning		✓	✓					
3	Tap / Tray / Stand cleaning		✓	✓					
4	Pantry floor / drain cleaning		✓	✓					

Sr No	Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
			1	2	3	4			
1	Water Cooler inside cleaning (after water clearance)	2nd	/						
2	Outside body cleaning								
3	Tap / Tray / Stand cleaning								
4	Pantry floor / drain cleaning								



Goodhost spaces Pvt. Ltd.

Activity - Housekeeping

Date: 15/09/23

Block: FC Zone: A1

Checklist No: GHS/ HK 14

Water Cooler (Monthly)

Work Description	Floor	Zone / Wing				Name of HK Assistant	Name of HK Supervisor	Sign
		1	2	3	4			
1 Drain the water from cooler and tank to be cleaned with water from inside.	Gr	✓	✓			Ravi	Devendra	Devendra
2 Outside body cleaning		✓	✓					
3 Tap / Tray / Stand cleaning		✓	✓					
4 Pantry floor / drain cleaning		✓	✓					

Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
		1	2	3	4			
1 Water Cooler inside cleaning (after water clearance)	1st	✓	✓			Santosh	Devendra	Devendra
2 Outside body cleaning		✓	✓					
3 Tap / Tray / Stand cleaning		✓	✓					
4 Pantry floor / drain cleaning		✓	✓					

Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
		1	2	3	4			
1 Water Cooler inside cleaning (after water clearance)	2nd							
2 Outside body cleaning								
3 Tap / Tray / Stand cleaning								
4 Pantry floor / drain cleaning								

SONTEX SUPER-DUX



Goodhost spaces Pvt. Ltd.

Activity - Housekeeping

Date : 13/08/23

Block : FC Zone :

Checklist No : GHS/ HK 14

Water Cooler (Monthly)

Sr No	Work Description	Floor	Zone / Wing				Name of HK Assistant	Name of HK Supervisor	Sign
			1	2	3	4			
1	Drain the water from cooler and tank to be cleaned with water from inside.	Gr	✓	✓			Geema	Jagdish	Jagdish
2	Outside body cleaning		✓	✓					
3	Tap / Tray / Stand cleaning		✓	✓					
4	Pantry floor / drain cleaning		✓	✓					

Sr No	Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
			1	2	3	4			
1	Water Cooler inside cleaning (after water clearance)	1st	✓	✓			Sumitra Santosh	"	✓
2	Outside body cleaning		✓	✓					
3	Tap / Tray / Stand cleaning		✓	✓					
4	Pantry floor / drain cleaning		✓	✓					

Sr No	Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
			1	2	3	4			
1	Water Cooler inside cleaning (after water clearance)	2nd	/						
2	Outside body cleaning								
3	Tap / Tray / Stand cleaning								
4	Pantry floor / drain cleaning								



Goodhost spaces Pvt. Ltd.

Activity - Housekeeping

Date : 15/09/23

Block : FG Zone : A1

Checklist No : GHS/ HK 14

Water Cooler (Monthly)

Work Description	Floor	Zone / Wing				Name of HK Assistant	Name of HK Supervisor	Sign
		1	2	3	4			
1 Drain the water from cooler and tank to be cleaned with water from inside.	Gr	✓	✓			fsem	Deviendra	Deviendra
2 Outside body cleaning		✓	✓					
3 Tap / Tray / Stand cleaning		✓	✓					
4 Pantry floor / drain cleaning		✓	✓					

Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
		1	2	3	4			
1 Water Cooler inside cleaning (after water clearance)	1st	✓	✓			Santosh	Deviendra	Deviendra
2 Outside body cleaning		✓	✓					
3 Tap / Tray / Stand cleaning		✓	✓					
4 Pantry floor / drain cleaning		✓	✓					

Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
		1	2	3	4			
1 Water Cooler inside cleaning (after water clearance)	2nd							
2 Outside body cleaning								
3 Tap / Tray / Stand cleaning								
4 Pantry floor / drain cleaning								

SONTEX SUPER-DILY



Good Host Spaces
Good Host Spaces

Goodhost spaces Pvt. Ltd.

Activity - Housekeeping

Date : 15/09/23

Block : FC Zone : A1

Checklist No : GHS/ HK 14

Water Cooler (Monthly)

Work Description	Floor	Zone / Wing				Name of HK Assistant	Name of HK Supervisor	Sign
		1	2	3	4			
1 Drain the water from cooler and tank to be cleaned with water from inside.	Gr	✓	✓			psem	Devendra	Devendra
2 Outside body cleaning		✓	✓					
3 Tap / Tray / Stand cleaning		✓	✓					
4 Pantry floor / drain cleaning		✓	✓					

Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
		1	2	3	4			
1 Water Cooler inside cleaning (after water clearance)	1st	✓	✓			Santosh	Devendra	Devendra
2 Outside body cleaning		✓	✓					
3 Tap / Tray / Stand cleaning		✓	✓					
4 Pantry floor / drain cleaning		✓	✓					

Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
		1	2	3	4			
1 Water Cooler inside cleaning (after water clearance)	2nd							
2 Outside body cleaning								
3 Tap / Tray / Stand cleaning								
4 Pantry floor / drain cleaning								

SONEX SUPER-DIY

Water Cooler (Monthly)

Sr No	Work Description	Floor	Zone / Wing				Name of HK Assistant	Name of HK Supervisor	Sign
			1	2	3	4			
1	Drain the water from cooler and tank to be cleaned with water from inside.	Gr	✓	✓			Geema Maya	[Signature]	[Signature]
2	Outside body cleaning		✓	✓					
3	Tap / Tray / Stand cleaning		✓	✓					
4	Pantry floor / drain cleaning		✓	✓					

Sr No	Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
			1	2	3	4			
1	Water Cooler inside cleaning (after water clearance)	1st	✓	✓			Sumitra Santosh	,,	✓
2	Outside body cleaning		✓	✓					
3	Tap / Tray / Stand cleaning		✓	✓					
4	Pantry floor / drain cleaning		✓	✓					

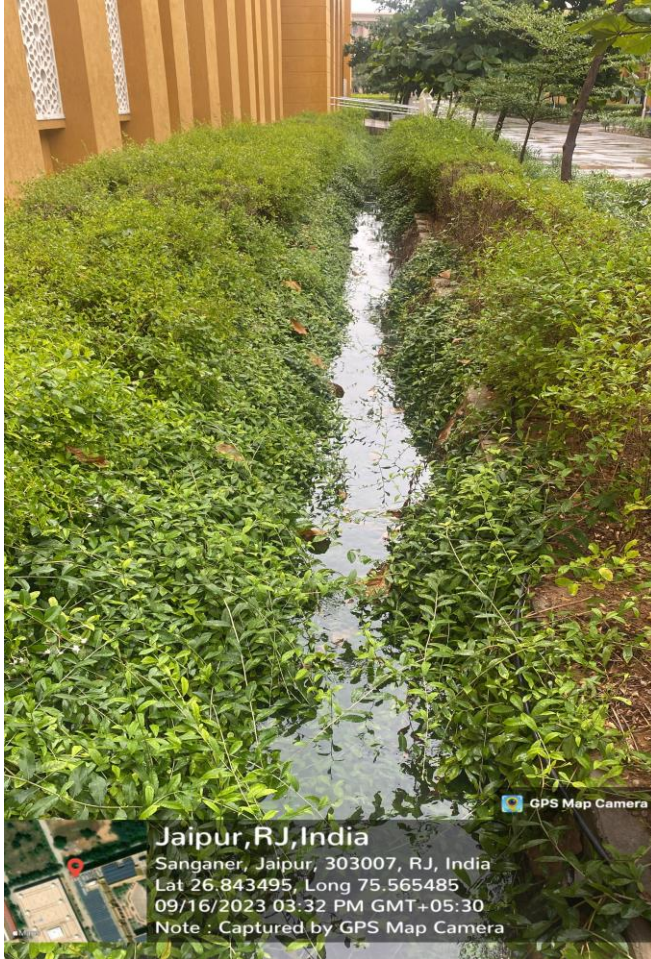
Sr No	Work Description	Floor	Zone / Wing				Name of HK boys / ladies	Name of HK Supervisor	Sign
			1	2	3	4			
1	Water Cooler inside cleaning (after water clearance)	2nd	/						
2	Outside body cleaning								
3	Tap / Tray / Stand cleaning								

Manipal University Jaipur Adopts Building Standards to Minimize Water Use

Water is a precious and finite resource, and as the global population continues to grow, conserving this essential element has become increasingly important. Manipal University Jaipur, as centers of education, innovation, and community, have a unique opportunity to lead by example in sustainable practices. One significant way Manipal University Jaipur does this is by applying building standards to minimize water use. Water scarcity is a pressing global issue, with many regions facing severe droughts and water stress. It is not only an environmental concern but also an economic and social one. Recognizing these challenges, Manipal University Jaipur is adopting a more responsible approach to water management. By implementing building standards aimed at reducing water consumption, universities can make a meaningful impact on their local communities and the planet.

One of the primary ways Manipal University Jaipur minimizes water use is through sustainable building design. When constructing new facilities or renovating existing ones, Manipal University Jaipur prioritizes water-efficient fixtures and technologies. Low-flow toilets, waterless urinals, and efficient faucets are examples of such fixtures that can significantly reduce water consumption (Picture 3, 4 & 5). Additionally, rainwater harvesting systems are being integrated into campus infrastructure to capture and reuse rainwater for irrigation and non-potable purposes. Campus landscapes are lush and beautiful, but they can be water-intensive to maintain (Picture 1). Manipal University Jaipur is reevaluating its landscaping and irrigation practices to strike a balance between aesthetics and sustainability. Xeriscaping, which involves using native, drought-resistant plants, is becoming increasingly popular. Smart irrigation systems that adjust watering schedules based on weather conditions and soil moisture levels are also being deployed to reduce water waste (Picture 2). Sustainability initiatives and awareness campaigns help foster a culture of responsibility towards water resources. Students are actively involved in sustainability clubs and organizations, contributing to the development and execution of water-saving strategies on campus. Manipal University Jaipur is a hub of research and innovation, and it is leveraging these resources to develop new technologies and strategies for water conservation. Faculty and students are conducting studies on water management, exploring cutting-edge solutions, and collaborating with local authorities and businesses to address water challenges in their regions.

Manipal University Jaipur is pursuing certification programs such as LEED (Leadership in Energy and Environmental Design) and the Living Building Challenge. These certifications require adherence to strict sustainability standards, including water efficiency criteria (Picture 6, 7, 8 & 9). By achieving these certifications, Manipal University Jaipur displays its commitment to sustainability and inspire other institutions and organizations to follow suit.



Picture 1: Rainwater used for water conservation through water canals



Picture 2: Use of Drip Irrigation at MUJ Campus



Picture 3: Dual stage flushing toilet



Picture 4: Auto Sensor Based Water Taps



Picture 5: Auto Sensor technique for Flushing



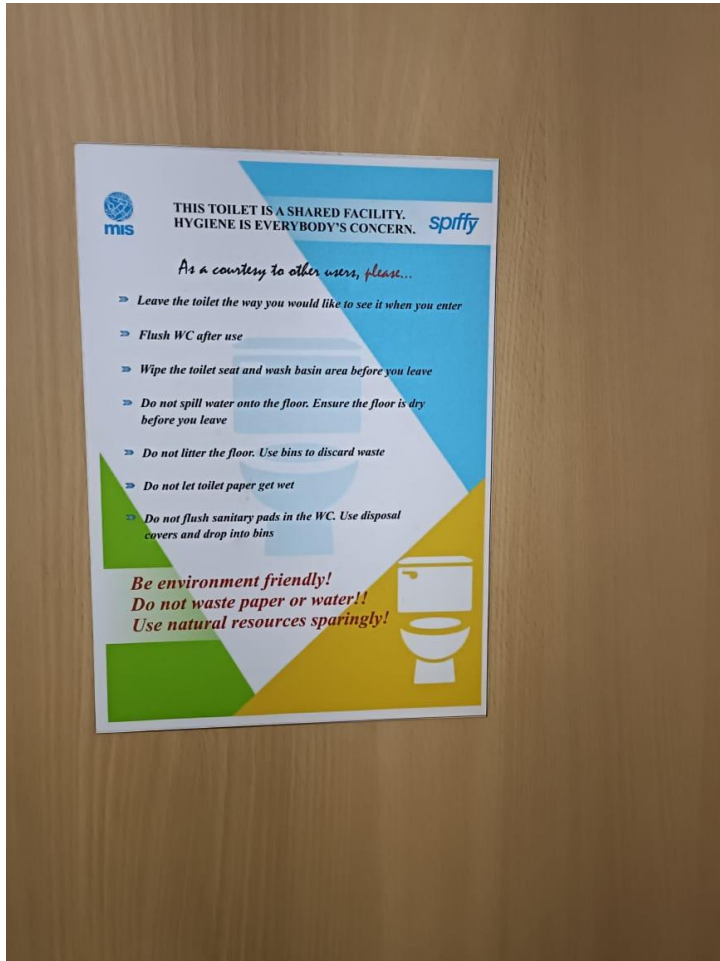
Picture 6: First University in the country to be awarded GRIHA award for integrated Water Management



Picture 7: Manipal University received award being the first Green Building Campus in the country



Picture 8: Award for Energy Conservation and Environment Friendly Design



Picture 9: Water Conservation and use minimization notice





**MANIPAL UNIVERSITY
JAIPUR**

MUJ/Q&C/021/F/1.03



**MANIPAL UNIVERSITY
JAIPUR**

FACULTY OF ENGINEERING

School of Civil & Chemical Engineering

Department of Civil Engineering

Executive Development Programme

On

Leadership & Management for Water & Sanitation Projects

Date of Event 29th Nov. 2021 to 3rd Dec. 2021



MANIPAL UNIVERSITY JAIPUR

Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the Guests
5. Brief Description of the event
6. Photographs
7. Brochure or creative of the event
8. Schedule of the Event
9. Attendance of the Event
10. News Publication
11. Feedback of the Event
12. Link of MUJ website



1. Introduction of the Event

Department of Civil Engineering SCCE, had organized five-day executive development programme on Leadership and Management for Water & Sanitation Projects from 29th Nov to 3rd Dec 2021 conducted in online mode. The Executive Development Program (EDP) is designed for professionals to enhance their knowledge about leadership and management in the field of water and sanitation projects. This program is being organized for all the professionals to nurture decision making and provide sustainable solutions for real-life problems associated with the aforesaid water and sanitation projects. The knowledge obtained through this program would be useful for planning and executing new projects and research endeavours. The convener of the programme was Mr Sagar Gupta, Assistant Professor, Civil Engineering Department under the guidance of Dr Meenakumari Sharma, Professor & HoD, Civil Engineering Department and Dr Bhavna Tripathi, Professor & Director, School of Civil & Chemical Engineering.

2. Objective of the Event

- To certify the professionals in the field of water & sanitation sectors.
- Enable a platform for Knowledge transfer and engagement for skill development.
- Networking with International & National Experts
- Disseminating toolkits and strategies about leadership and management for inculcating skills of negotiation, consensus-building and leadership development.

3. Beneficiaries of the Event

The event successfully generated an overwhelming response, and 18 professionals were certified with certificates. The event fosters an environment for professionals to interact with experts and the department of civil engineer faculty.

4. Details of the Guests

- Mr Dorai Narayan, Specialist & Consultant WASH, Malaysia**
- Dr Lakshminarayanan S, Professor, School of Management, MAHE, Karnataka**
- Mr Rusabh Hemani, WASH Expert, UNICEF Rajasthan**
- Dr Ahmad Kazmi, Professor, IIT Roorkee**
- Dr Sanjay Pattanshetty, Associate Professor, Prassana School of Public Health, MAHE, Karnataka**

5. Brief Description of the event

The Executive Development Program (EDP) is designed for professionals to enhance their knowledge about leadership and management in the field of water and sanitation projects conducted in online mode. This program is being organized for all the professionals to nurture decision making and provide sustainable solutions for real-life problems associated with the aforesaid water and sanitation projects. The knowledge obtained through this program would be useful for planning and executing new projects and research endeavours. The convener of the programme was Mr Sagar Gupta, Assistant Professor, Civil Engineering Department under the guidance of Dr Meenakumari Sharma, Professor & HoD, Civil Engineering Department and Dr Bhavna Tripathi, Professor & Director, School of Civil & Chemical Engineering. The Programme was 500 INR per Participant.



6. Brochure or creative of the event



MANIPAL UNIVERSITY
JAIPUR



Executive Development Programme (EDP) Leadership and Management for Water & Sanitation Projects

Manipal University Jaipur is the first university in the state of Rajasthan accredited as A+ (3.28) grade by NAAC. The Faculty of Engineering has been ranked 84th among engineering institutions by NIRF in 2021.

The Department of Civil Engineering was established in Manipal University Jaipur in 2011. It offers two undergraduate Programme, B. Tech in Civil engineering, and B. Tech (Hons.) in civil engineering with specialisation in Geoinformatics. Also, it offer M.Tech in 3 specialisation:-

(I) Structural Engineering (ii) Environmental Engineering (iii) Non-Sewered Sanitation.

The Executive Development Program (EDP) is designed for professionals to enhance their knowledge about leadership and management in the field of water and sanitation projects. This program is being organized for all the professionals to nurture decision making and provide sustainable solutions for real-life problems associated with the aforesaid water and sanitation projects. The knowledge obtained through this program would be useful for planning and executing new projects and research endeavours.

What You Will Learn

- Leadership principle and styles
- Operation management in wastewater treatment plant
- Tool and techniques for monitoring and evaluation of projects
- Smart Approach for water security and safety
- Decision making for sustainable sanitation solution
- Conflict management and consensus building
- Swachh Bharat Mission 2.0 and way forward

Key Speakers

- Chief Engineer's from government Organisation
- Professor's from IIT's, NIT's and Renowned Institutions
- Field Experts in water & Sanitation

Methodology

- Online Interactive sessions
- Engaging Presentation
- Experience Sharing
- Case studies
- Assessment Toolkits

Who Can Apply:

Experienced Professionals Working in Industries, NGO's and Academia.

Registration Link:

<https://forms.gle/LCBjmKvbfCjgmYNr8>

EDP Fees: INR 500 per participant

Payment QR code

Benefit of EDP: Certification on successfully completion of training.

Helpful in career advancement

Date: 29th Nov to 3rd Dec 2021

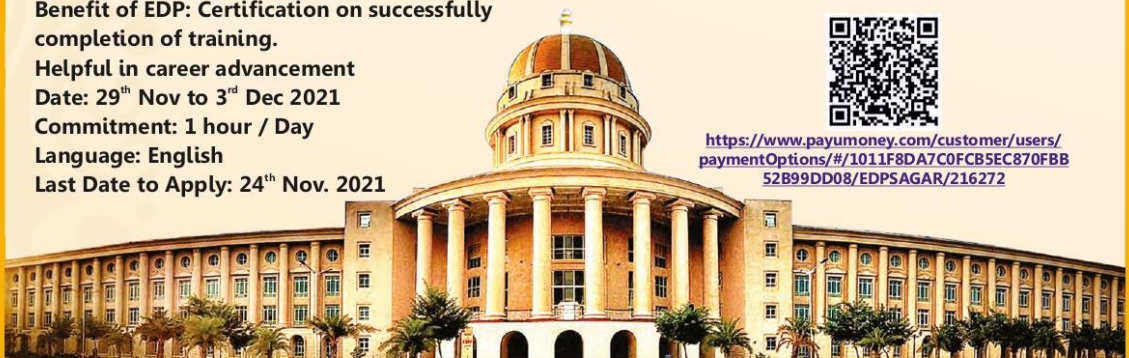
Commitment: 1 hour / Day

Language: English

Last Date to Apply: 24th Nov. 2021



<https://www.payumoney.com/customer/users/paymentOptions/#/1011F8DA7C0FCB5EC870FBB52B99DD08/EDPSAGAR/216272>



For Details Contact: -

Mr Sagar Gupta, EDP coordinator

sagar.gupta@jaipur.manipal.edu, +91-7837888980 (M)

School of Civil & Chemical Engineering, Manipal University Jaipur



Executive Development Programme (EDP) Leadership and Management for Water & Sanitation Projects

Key Speakers



Dorai Naryana,
Consultant Sanitation & Sewerage
Sector, Malaysia
*Topic- Decision Making for
Sustainable Sanitation Solutions*



Dr Lakshminarayanan S
Professor, Manipal Institute of
Management
*Topic – Conflict management
and consensus building*



Mr Rushabh Hemani
WASH Specialist, UNICEF
Rajasthan
*Topic- Domestic Water Security
in Rajasthan*



Dr Absar Ahmad Kazmi
Professor, IIT Roorkee
*Topic - Good practices in
Sewage Treatment Recycling &
Reuse*



Dr Sanjay M Pattanshetty
Associate Professor, Kasturba Medical
College, Manipal
Topic – Leadership Principle & Styles

Last date of Registration
26th Nov 2021
Online Mode
Duration of Programme
29th Nov to 3rd Dec 2021

Registration Link:

<https://forms.gle/LCBJmKvbfCjgmYNr8>

Payment QR code

[https://www.payumoney.com/customer/users/
paymentOptions/#/1011F8DA7C0FCB5EC870F
BB52B99DD08/EDPSAGAR/216272](https://www.payumoney.com/customer/users/paymentOptions/#/1011F8DA7C0FCB5EC870FBB52B99DD08/EDPSAGAR/216272)



For Details Contact: -

Mr Sagar Gupta, EDP coordinator sagar.gupta@jaipur.manipal.edu, +91-7837888980 (M)
School of Civil & Chemical Engineering, Manipal University Jaipur



Executive Development Programme (EDP) Leadership and Management for Water & Sanitation Projects

SCHEDULE

S. N O.	Topic	Date & Time	Name of Speaker
1.	Decision Making For Sustainable Sanitation Solutions	29 th Nov. 2021 1:00 PM to 2:00 PM	Dorai Naryana, Consultant Sanitation & Sewerage Sector, Malaysia
2.	Consensus Building and Conflict Management	30 th Nov. 2021 11:30 AM to 12:30 PM	Dr Lakshminarayanan S, Professor, Manipal Institute of Management, MAHE, Karnataka
3.	Domestic Water Security in Rajasthan	1 st Dec. 2021 1:00 PM to 2:00 PM	Mr Rushabh Hemani, WASH Specialist, UNICEF Rajasthan
4	Good Practices in Sewage Treatment Recycling & Reuse	2 nd Dec. 2021 12:00 AM to 1:00 PM	Dr Absar Ahmad Kazmi Professor, IIT Roorkee
5.	Leadership Principle & Styles	3 rd Dec. 2021 1:00 PM to 2:00 PM	Dr Sanjay Pattanshetty Associate Professor, Prasanna School of Public Health, MAHE, Karnataka



For Details Contact: -

Mr Sagar Gupta, EDP coordinator sagar.gupta@jaipur.manipal.edu, +91-7837888980 (M)

School of Civil & Chemical Engineering, Manipal University Jaipur



Executive Development Programme (EDP) Leadership and Management for Water & Sanitation Projects

INVITATION FOR INAUGURAL

MINUTES TO MINUTES

Executive Development Programme in Leadership and Management for Water &
Sanitation Projects

29th Nov. - 3rd Dec. 2021

S. NO.	Speaker	Time Duration	Inaugural Details
1	Prof. Rajveer Singh Shekhawat Dean Faculty of Engineering	12:45 PM - 12:50 PM	About Faculty of Engineering, MUJ
2	Prof. Bhavna Tripathi Director School of Civil and Chemical Engineering	12:50 PM- 12:55 PM	About School of Civil and Chemical Engineering, MUJ
3	Prof. Meena Kumari Sharma, Head Department of Civil Engineering	12:55 PM - 1:00 PM	About Department of Civil Engineering, MUJ

LINK TO JOIN THE EVENT - <https://rb.gy/abu9zq>



For Details Contact: -

Mr Sagar Gupta, EDP coordinator sagar.gupta@jaipur.manipal.edu, +91-7837888980 (M)

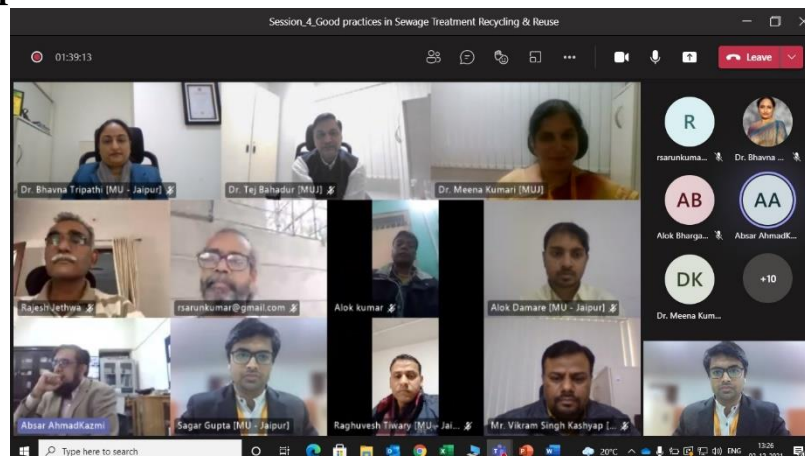
School of Civil & Chemical Engineering, Manipal University Jaipur

7. Attendance of the Event

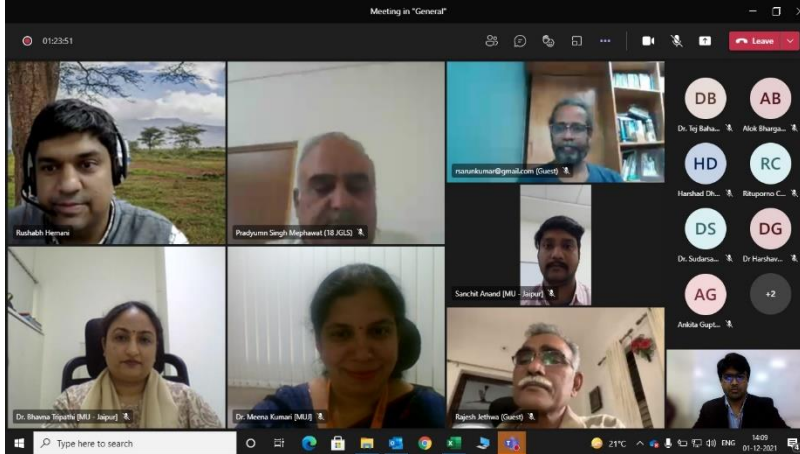
Total attendee- 20

Manipal University Jaipur		
School of Civil & Chemical Engineering		
Department of Civil Engineering		
Executive Development Programme on Leadership & Management for Water & Sanitation Projects		
Duration	5 days, Nov. 29 to Dec. 3, 2021	Platform - MS Teams
Attendance List		
S. NO.	Name	Email
1	Radheshyam Vishwakarma	kshitizradhe.ind@gmail.com
2	Raghavender K	k.l.raghava@gmail.com
3	Shaitan Singh	shaitansinghphe@gmail.com
4	Arun Kumar Rayavellore Suryakumar	rsarunkumar@gmail.com
5	Manisha Jain	manisha.j1992@gmail.com
6	Sudarsan J S	Sudarsanjss@gmail.com
7	Karthikesh Swami	karthikeshswami@gmail.com
8	Rajesh Jethwa	rajethwa@gmail.com
9	Alok Bhargava	bhargava303@gmail.com
10	Arvind Singh Raghuwanshi	raghuwanshiwind@gmail.com
11	Kislay Raja	kislay.raja@atkinglobal.com
12	Alok Kumar	alokyuva5@gmail.com
13	Ankita Gupta	a.gupta2507@outlook.com
14	Jay Anil Shah	jshah@taru.co.in
15	Rituparno Chanda	rchanda@taru.org
16	Sagarika Srinivas Rao	srao@taru.org
17	Harshad Dhande	hdhande@taru.co.in
18	Suraj Kumar Gouda	surajmanoj95@gmail.com
19	Dr Bhavna Tripathi	bhavna.tripathi@jaipur.manipal.edu
20	Dr Meena Kumari Sharma	meena.kumari@jaipur.manipal.edu

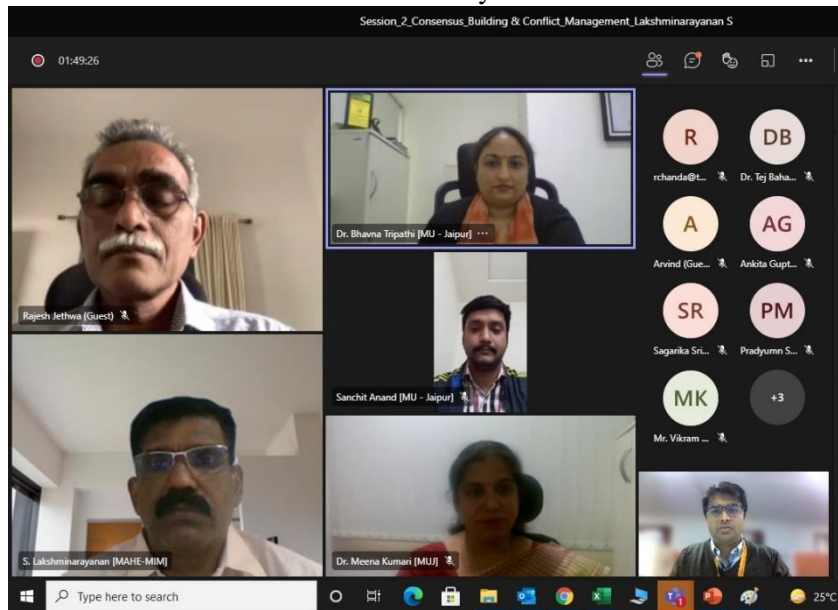
8. Photograph



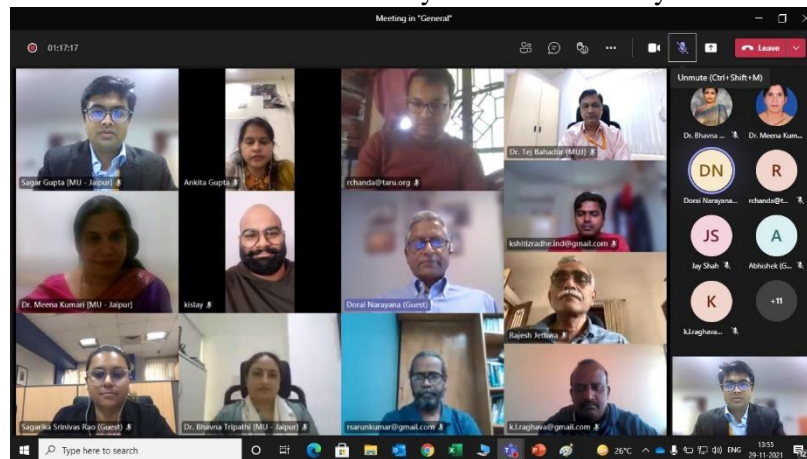
Pic no.1 Session Delivered at EDP by Prof Kazmi



Pic No. 2 Session Delivered by Mr Rusabh Hemani



Pic no.3 Session Delivered by Prof Lakshminarayanan S



Pic no. 4 Session Delivered by Mr Dorai Naryana



Pic no.5 Session Delivered by Dr Sanjay Pattanshetty

9. Feedback of the Event



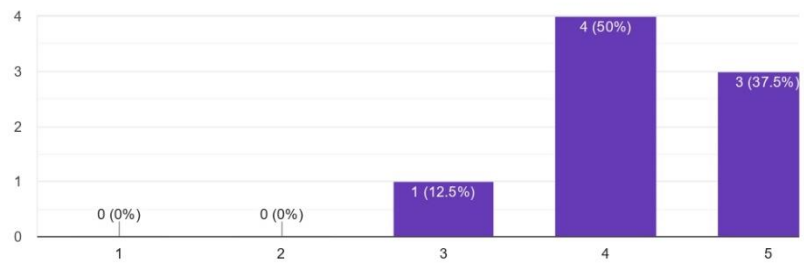
Enter Your Name

8 responses

- Mr Rajesh Jethwa
- Raghavender Kurakula
- Dr. Meena Kumari Sharma
- Dr.Sudarsan J S
- Md Parwez Akhtar
- Karthikesh Swami
- Rituparno Chanda
- Harshad Dhande

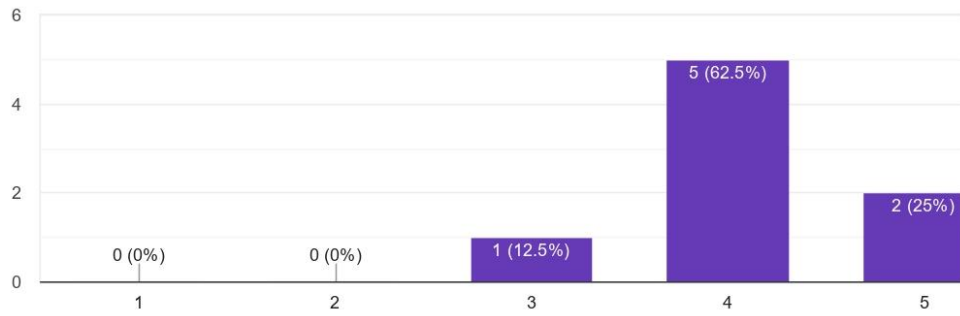
Rate the Relevance of topic to the theme of lecture.

8 responses



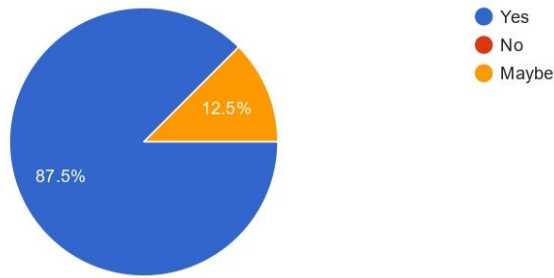
Rate quality of Lecture and reading material delivered.

8 responses



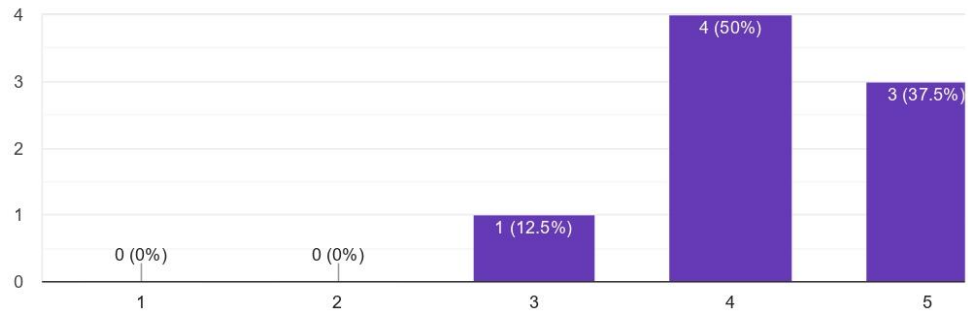
Does topic is helpful for knowledge enhancement and skill development

8 responses



Rate the Utilization of time for the session.

8 responses



Please suggest anything you want us to add or improve upon

8 responses

Reading-Reference material / notes may be provided prior to respective session. ppts may be shared.

Great

Everything was perfect

Good Session More practice case studies will be more helpful

Good EDP-Modules suitably designed and scheduled

As and when on site programs happen, it would benefit participants quite a lot. With respect to WASH, would suggest partnering with international institutes / universities to derive maximum benefit.

Sewage Treatment Recycling and Reuse is based on US based environment. If there is more focus on India based system like Co-treatment or Kerala Based model than it will be helpful more helpful. Also some case studies on India based environment.



MANIPAL UNIVERSITY
JAIPUR



Certificate

This is to certify that **Mr. Karthikesh Swami** working as **Asset Manager, Veolia Middle East** has successfully completed five day Executive Development Programme on **Leadership and Management for Water & Sanitation Projects** organized from 29th November to 3rd December 2021 in online mode. The programme was organized under the Decennial year celebration by Department of Civil Engineering, School of Civil & Chemical Engineering, Manipal University Jaipur, Jaipur.

Mr Sagar Gupta
Convener

Prof Meena Kumari Sharma
HoD, Civil Engineering

Prof Bhavna Tripathi
Director, SCCE

Prof Rajveer Singh Shekhawat
Dean, FoE

Certificate No. EDP/LMWSP/DCE/2021-22/0007



MANIPAL UNIVERSITY
JAIPUR



Certificate

This is to certify that **Dr. Sudarsan. J.S** working as **Assistant Professor in School Of Construction Management, NICMAR, Pune** has successfully completed five day Executive Development Programme on **Leadership and Management for Water & Sanitation Projects** organized from 29th November to 3rd December 2021 in online mode. The programme was organized under the Decennial year celebration by Department of Civil Engineering, School of Civil & Chemical Engineering, Manipal University Jaipur, Jaipur.

Mr Sagar Gupta
Convener

Prof Meena Kumari Sharma
HoD, Civil Engineering

Prof Bhavna Tripathi
Director, SCCE

Prof Rajveer Singh Shekhawat
Dean, FoE

Certificate No. EDP/LMWSP/DCE/2021-22/0010





DIRECTORATE OF STUDENT'S WELFARE

MANIPAL UNIVERSITY JAIPUR

DEPARTMENT OF BIOSCIENCES

ENVIRO CLUB PRESENTS

Health & Hygiene -A healthy woman makes a healthy society”

(LIVE WATER LAB TESTING)

**Type of Event (Conference/Seminar/Industry Lecture/ Capacity
Enhancement Session/ Alumni Lecture/etc.)**

Date of Event (11th March 2022)



Content of Report (index)

(Page number may not be required)

(Delete entries which are not applicable)

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the Guests
5. Brief Description of the event
6. Geo-tagged Photographs
7. Brochure or creative of the event
8. Schedule of the Event
9. Attendance of the Event



1. Introduction of the Event

Enviro club in collaboration with Rotary club, Bapu Nagar Jaipur conducted an event with the aim of spreading awareness about drinking water and its measures to test if its fit for drinking purpose or not. This awareness was created among 10th and 12th students of Govt. Senior Secondary School, Begas on 11th March 2022 at 10:00 AM to 12:00 PM.

2. Objective of the Event (bullet points or about 50 words)

- To spread awareness about various parameters of drinking water.
- To guide students on water testing procedures.
- To educate the girls about water and sanitation.

3. Beneficiaries of the Event (Student/Faculty/Community etc) (25 words)

- MUJ students
- 10TH AND 12TH students of Government senior secondary school, Begas
- School and MUJ faculty staff.

4. Details of the Guests (Chief Guests, speakers etc Designation, organization, contact details if any please give them in sr no)

- a. Dr. Neetu Bhatnagar (Registrar of MUJ)
- b. Dr. Monika Sogani (Sr. Associate Professor)

5. Brief Description of the event (about 200 words)

"A Healthy Woman Makes a Healthy Society" a key initiative and awareness program by India's lead private university #ManipalJaipur in collaboration with #RotaryClub Bapu Nagar Jaipur for more than 200 school girls and boys in near by rural School at Begas. The program was addressed by Chief guest of the function Dr Nitu Bhatnagar, Registrar #MUJ along with Guest of Honour President Rotary Club Bapu Nagar Sh N L Mathur Shb.

Excellent interactive sessions by our female faculty Dr Monika Sogani, Dr Meena Sharma and Dr Reena Poonia on water safety, safe sanitation and opportunities for women in sports.

Special Thanks to #Rotarian team Dr Sudheer Kallaa shb, R S Gupta Shb, Ms Meeta Mathur Mam, Raguhvir Bhandari sa and School Principal Ms Yadav.

6. Photographs

3 to 5 geotagged photographs of the event or screenshots of the event (if online) with captions

DEMONSTRATING THE INSIGHTS OF HEALTH AND HYGIENE



EDUCATING THE CHILD ABOUT WATER AND ITS CAUSES



EDUCATING THE CHILD ABOUT WATER AND ITS CAUSES



EDUCATING THE CHILD ABOUT WATER AND ITS CAUSES



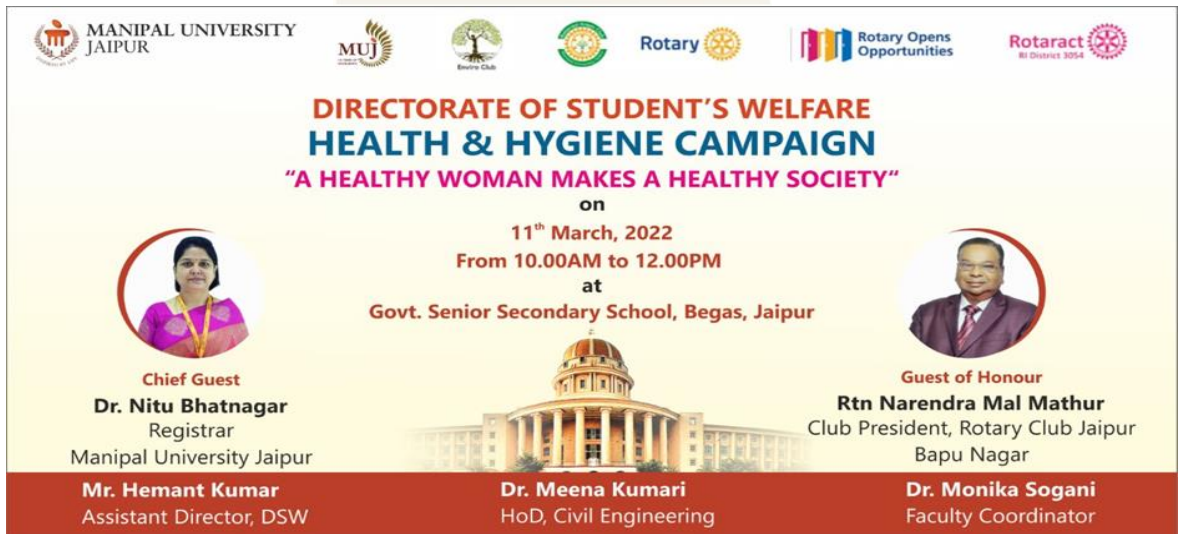
EDUCATING THE CHILD ABOUT WATER AND ITS CAUSES


7. Brochure or creative of the event






LIVE WATER LAB
जल ही जीवन है
MANIPAL UNIVERSITY JAIPUR
DIRECTORATE OF STUDENT'S WELFARE
(ENVIRO CLUB
/RGC CLUB)
In joint collaboration with
ROTARY CLUB, JAIPUR, BAPU NAGAR
(CLUB ID 73485, Rid 3054)
Organizes
DRINKING WATER TESTING
VENUE: Begas Government School
Time: 10:30 Am Date: 11th March, 2022
 Dr. Monika Sogani Sr. Associate Professor, Dept. of Biosciences, Faculty Coordinator, ENVIRO Club, MUJ
 Mr. Hemant kumar Assist. Professor, Dept. of Mechatronics Faculty Coordinator, RGC Club, MUJ







DIRECTORATE OF STUDENT'S WELFARE
HEALTH & HYGIENE CAMPAIGN
"A HEALTHY WOMAN MAKES A HEALTHY SOCIETY"
 on
11th March, 2022
From 10.00AM to 12.00PM
 at
Govt. Senior Secondary School, Begas, Jaipur



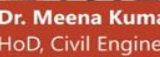
Chief Guest
Dr. Nitu Bhatnagar
Registrar
Manipal University Jaipur




Guest of Honour
Rtn Narendra Mal Mathur
Club President, Rotary Club Jaipur
Bapu Nagar



Mr. Hemant Kumar
Assistant Director, DSW



Dr. Meena Kumari
HoD, Civil Engineering



Dr. Monika Sogani
Faculty Coordinator

8. Schedule of the event (insert in the report)

Serial No.	Name of Students
1	Aditi Agarwal
2	Sakshi
3	Aradhana
4	Manoj
5	Gilchrist
6	Supriya
7	Sanjana
8	Dhruv
9	Tarushi
10	Aanchal
11	Gaury
12	Gurmehar
13	Ishan
14	Mehak



MANIPAL UNIVERSITY JAIPUR

15	Om
16	Preeti
17	Revansh
18	Sahil
19	Sanskar

The event took place offline on the 11th of March 2022

9. Attendance of the Event (insert in the document only)

Total attendee 19

Dr Abhijeet Singh

Dr. Monika Sogani

Seal and Signature of Head with date



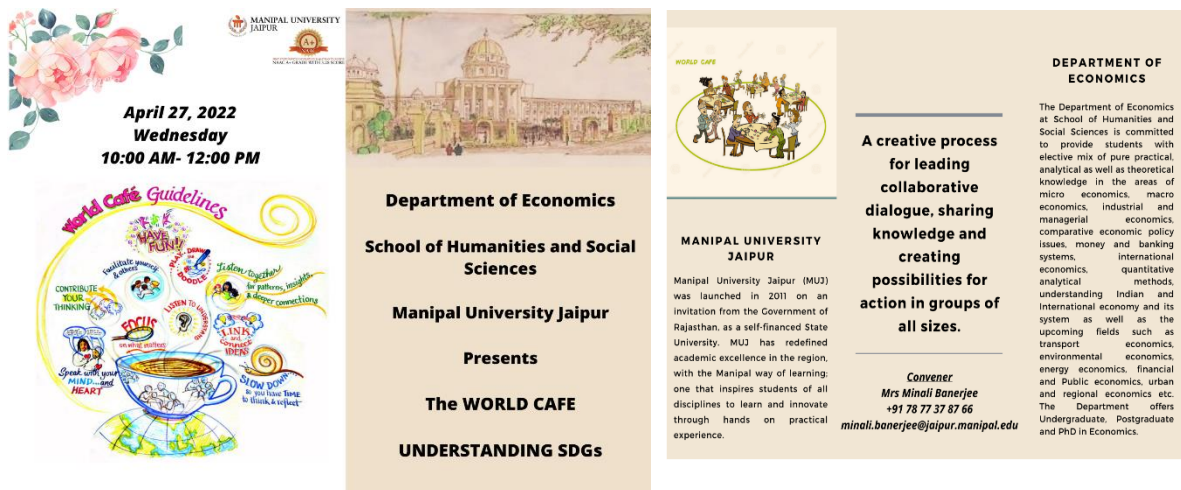
**DEPARTMENT OF ECONOMICS
FACULTY OF ARTS
SCHOOL OF HUMANITIES AND SOCIAL SCIENCES
MANIPAL UNIVERSITY JAIPUR**

Report

Title: The World café- Understanding SDGs

Date: April 27, 2022

Brochure:



About the Event:

A school connect activity titled the World café was organised by the Department of Economics, School of Humanities and Social Sciences, Manipal University Jaipur on 'Sustainable Development Goals. Fifty-eight students of class XII from Spring field school, Mansarovar Jaipur, participated. The aim was to make students self-reflect and discuss some of the emerging global issues.

The three rounds of discussion took place on Poverty, Quality education, good health, climate action, responsible consumption, Economic growth, gender equality, and clean water. The students participated very enthusiastically. The discussion took place informally in a café setup. The students reflected on these issues by colouring their ideas into the chart papers.

The event winds up with some career counselling sessions.

Attendance Sheet:

Name	WhatsApp contact number	Email	Father name	Father's WhatsApp contact number



Rupali kumawat	9887444772	rupaliprivate24@gmail.com	Sunil kumawat	9887444772
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Tanisha Singhal	7851013094	singhaltanish a7@gmail.co m	Lakhmi chand Singhal	9829144284
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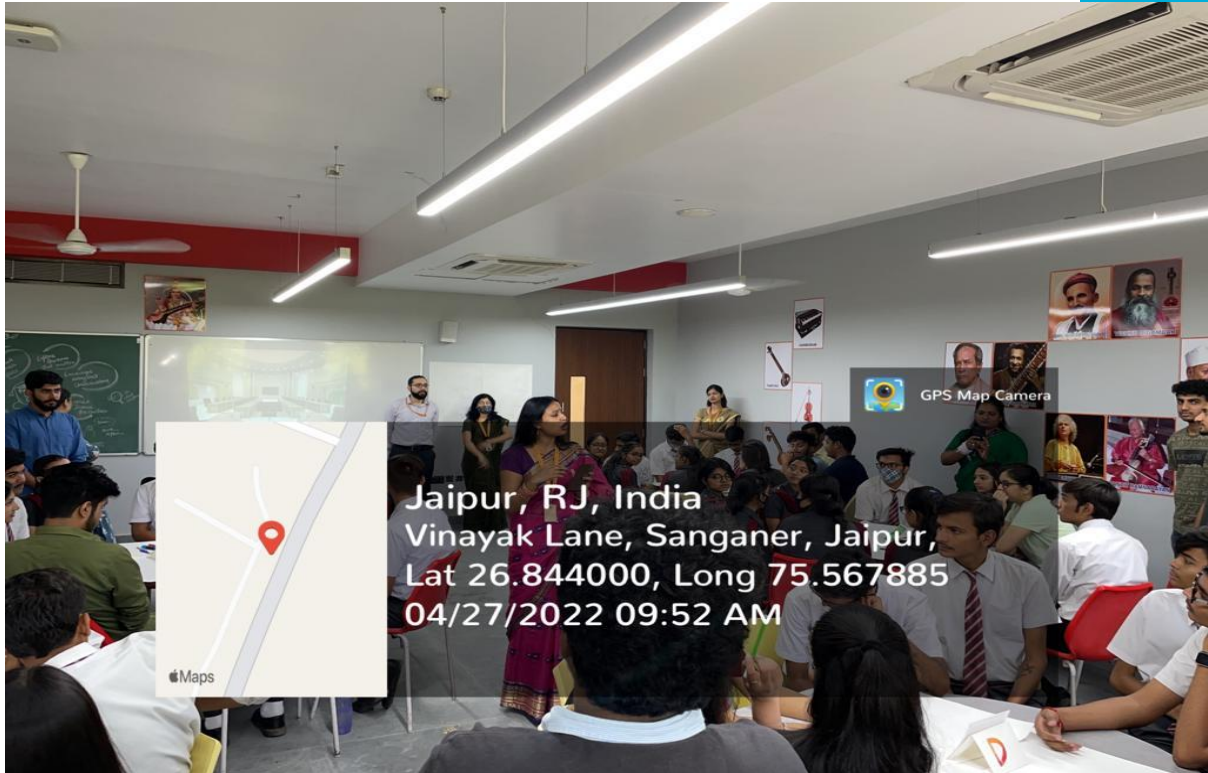
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Dev Bhandari	7597457875	devsinghbhandari06@gmail.com	Rakesh Singh Bhandari	9460435770

Pictures of the Event:





Water-Conscious Planting

As the world grapples with increasing concerns over water scarcity and the need for sustainable environmental practices, Manipal University Jaipur is taking a lead role in promoting water-conscious planting. Manipal University Jaipur realizes the importance of landscaping that not only beautifies their campuses but also conserves water resources.

Manipal University Jaipur plants native plants and drought-tolerant species for its landscaping needs. Native plants are adapted to the local climate, requiring less water and maintenance than non-native species. These plants also support local wildlife and ecosystems. By incorporating them into campus landscapes, Manipal University Jaipur is reducing its water footprint while promoting biodiversity. Xeriscaping is a landscaping approach that focuses on water conservation. Manipal University Jaipur adopted xeriscaping principles, which include using drought-resistant plants, mulching to retain moisture, and minimizing turf grass areas (Annexure 1, 2, 3, 4, 5, 6, 7, 8, 9). This approach not only reduces water usage but also decreases the need for chemical fertilizers and pesticides, contributing to healthier ecosystems. Manipal University Jaipur has an irrigation system with smart technology that monitors weather conditions and soil moisture levels. These systems can adjust watering schedules and volumes, accordingly, ensuring that plants receive just the right amount of water. This precision reduces water waste and prevents overwatering, which can harm plants and leach chemicals into groundwater. Rainwater harvesting is another innovative approach adopted by Manipal University Jaipur. Collecting rainwater from roofs and other surfaces allows institutions to reuse this resource for irrigation purposes. It reduces the demand for water supplies and conserves water during dry seasons. Manipal University Jaipur is even incorporating rain gardens, designed to capture and filter rainwater, into its landscaping plans. When designing new campus buildings and outdoor spaces, Manipal University Jaipur is integrating sustainable principles into its plans. This includes selecting plant species that align with water-conscious goals and using permeable materials that allow rainwater to infiltrate the soil rather than run off into stormwater drains (Annexure 10 & 11).

Manipal University Jaipur is taking meaningful steps to minimize water usage through water-conscious planting. By choosing native and drought-tolerant plants, embracing xeriscaping, implementing smart irrigation systems, and engaging in rainwater harvesting, these institutions are demonstrating their commitment to environmental sustainability (Annexure 10 & 11).













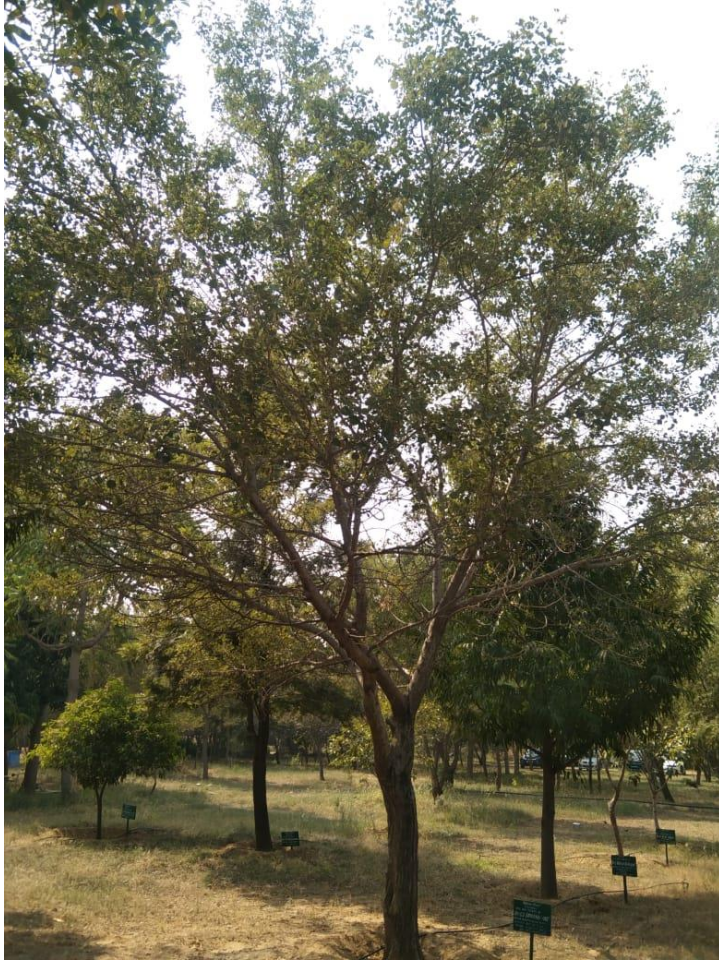
















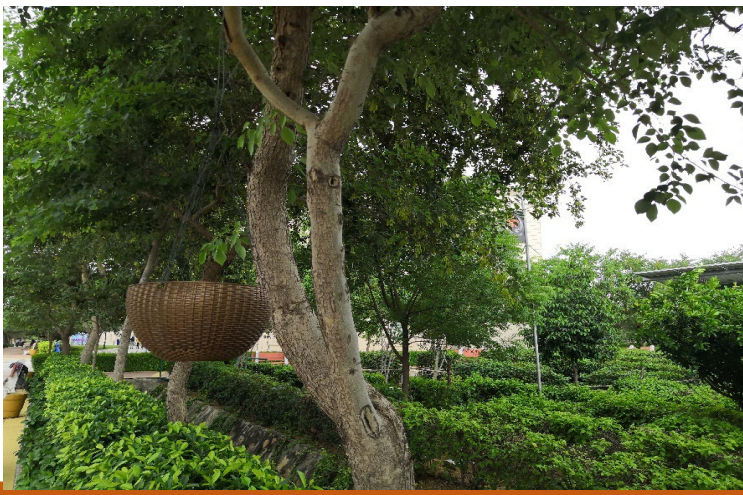
Green Campus at Manipal
University Jaipur



**MANIPAL UNIVERSITY
JAIPUR**

(University under Section 2(f) of the UGC Act)

GREEN CAMPUS





GREEN CAMPUS- Biodiversity at MUJ

Total Green area of Campus per Capita is 7.34							
Unit	Academic	Hostel	Housing	total Green Area	No. of Studesnts and Staff		
Area Green Cover in Sq Mtr	33,324.44	19,395.86	13,500.00	66,220.30	9026	7.34	

Green Area at MUJ

	Ocuupied Green Area	Sq. Mtr
a	lawn	26488.1197
b	tree covered	2648811.97
c	hedges	13244.05985
d	potted plant	1000



Sowed Tree in MUJ Last Year

sowed Tree quantity	
	110MUJ
	110MUJ
	6000MUJ
	512MUJ
	82MUJ
	47MUJ
	47MUJ
	47MUJ
	100hostel
Total	7055
PAX	1500
Per	4.7033333
Capita	33



GREEN CAMPUS- Biodiversity at MUJ

Plant Species

Name Of Plant
1 Murraya Exotica
2 Nerum Olegander Dwarf
3 Vernonia Elegfolia
4 Clerodenrum Inermie
5 Bougainvillea Subra Whir
6 Euphorbia Milli Pimk
7 Ficus Panda
8 Alamanda Dwarf- Yellow
9 Ixora Dwarf- Pink
10 Plumeria Alba
11 Cycas Revoluta
12 Rhoeo Discolor
13 Raphes Palm
14 Barleria Ubusa
15 Gulfumia Guluska
16 Railway Creeper

Tree Species

Sr. No.	Name Of Tree
1	Delbergia Sisoo
2	Terminalia Arjuna
3	Allestonia
4	Bhuhania balkenia
5	Silver Oak
6	Jcaranda Memumsfolia
7	Chakresic
8	Karanj
9	Ficus Verins
10	Delonix Regia
11	Terminalia Chattapa
12	Azadrichata Indica
13	Dates Palm
14	Lagerstromia Indica
15	Golden Bamboo
16	Ficus Benjamina
17	Mimusops Elengi
18	Mango
19	Jamun
20	Terminalia Mantaly
21	Cassia Fistula
22	Lagerstromia Florreginae
23	Tecoma Gouri Chori
24	Sadabhar Mango Tree

➤ [Medicinal Plants at MUJ \(click here\)](#)



**MANIPAL UNIVERSITY
JAIPUR**

(University under Section 2(f) of the UGC Act)

Campus Green Rated





Green Programs



**Toilet Block at Bagru Police
Station, Jaipur**

Tree Plantation on Roadside at vicinity



Green Programs



T44 Gulmohar *Fabaceae*

Planted by - Shri Purushottam Agarwal
Year of Plantation - 2014
Family- Leguminosae - Leguminosae

Nature -Deciduous
Climate -Temperate and tropical
Texture of leaf -wrinkled/pubescent
Shape & Colour of leaf -Range from pinnately or palmately compound to simple,Green
Foliage of tree -Dense
Soil Type -soil that is above freezing temperatures and offers enough warmth
Height of tree - 10-15m
Diameter of trunk - 2 inches
Region - predominant outside the tropics

Uses
- Anti-diabetic activity
-To treat polymenorrhoea, anemia, ulcers and menorrhagia (during pregnancy).
-In the treatment of diarrhoea. In overcoming the protein deficiency Kwashiorkor and can also impact hypocholesterolaemic conditions, and thyroxine-Induced hyperglycaemia.







T40 Rugtoora *Spathodea campanulata*

Planted by -Shri N.R Narayan Murthi
Year of Plantation - 2018
Family- Bignoniaceae

Nature -Deciduous
Climate - Cooler tropical climate
Shape & Colour - Bark - when young is pale grey brown and smooth which turns to grey-black.
Foliage of tree - Compact, round crown of dense and dark green foliage
Height of the tree - 7-25 m
Region - West coast from Guinea to Angola, and inland across the tropical rainforest region to southern Sudan and Uganda

Uses
- Cure rashes and inflamed skin,
-Lower blood sugar levels.
-Treat ulcers,
-Treat diabetes,
-Cure glaucoma







T43 Kadamb *Neolamarckia cadamba*

Planted by - Smt. Vasanti Pai
Year of Plantation - 2012
Family- Madder family

Nature -Evergreen
Climate -Tropical
Shape & Colour - Flowers: flowers are sweetly fragrant, red to orange in colour, occurring in dense
Foliage of tree- broad crown and straight cylindrical bole
Soil Type -it grows well in deep moist alluvial soils, often along river banks.
Height of tree - up to 45 m
Diameter of trunk - 100cm
Region - South and Southeast asia

Uses
- Low-grade timber and paper
- Timber is used for plywood and light construction.







T39 Sheesham *Dalbergia sissoo*

Planted by - Shri G.S. Sandhu (IAS)
Year of Plantation - 2014
Family- Leguminosae - Mimosoideae

Nature - Deciduous Tree
Climate - Indian subcontinent and southern Iran
Texture of trunk: are often crooked when grown in the open. Leaves are leathery
Foliage of tree- Round foliage
Soil Type - Soils range from pure sand and gravel to rich alluvium of river banks.
Height of tree- 25 m (82 ft)
Diameter of trunk- 2-3 m
Region - Native to India, Pakistan and Nepal

Uses
- Decoration of leaves is useful in gonorrhoea.
- Wood is alterative, useful in leprosy, boils, eruptions and to allay vomiting.
- The wood is used for making doors, window frames, furniture, especially cabinets and much more.
- The pulp of wood is also used for making papers.







T10 Saat Patti *Alstonia scholaris*

Planted by - Dr. Ajay Kumar
Year of Plantation - 21st March 2012
Family- Apocynaceae

Nature -Evergreen
Climate - Tropical
Leaf Texture - Glossy & Greyish
Leaf Shape & Colour - Flattened roots similar to buttresses.
Foliage Shape - Slightly round.
Soil Type - Red Alluvial
Tree Height - 20-40 mts.
Bark Diameter - 100-200cms.
Region - Malaysia Pakistan

Uses
- Alstonia scholaris has been used in different system of traditional medication for the treatment of diseases.
- The wood of Alstonia scholaris has been recommended for the manufacture of pencils.
- Wood close to the root is very light and of white color, and is used for net floats, household utensils, trenchers, corks, etc.
- Used for landscape purpose.







T17 Neem *Azadirachta indica*

Planted by - Dr. Kiran Mazumdar Shan
Year of Plantation - 9th August 2014
Family- Leguminosae - Melaiceae

Nature - Evergreen
Climate - Tropical & Semi-Tropical Region
Leaf Texture - Mildly soft
Leaf Shape & Colour - Long medium to dark green
Foliage Shape - Round
Soil Type - All types
Tree Height - 15 to 20 mts.
Bark Diameter - 30-80 cms.
Region - Burma, Iran, India and Pakistan

Uses
- The neem tree is noted for its draught resistance. It can grow in many different type of soil.
- Dried neem leaves prevents insects from eating clothes and can also be used in storing rice.
- The flowers and the shoot are eaten as a vegetable.
- Products made from neem tree can be used as medicine.
- Neem is a key ingredient in pesticides.







T19 Bottle Brush *Callistemon*

Planted by - D.S.Chauhan
Year of Plantation - 18-01-2017
Family- Myrtle

Nature - Evergreen
Climate - Temperate regions
Texture of flower- Fury
Shape & Colour - Flower: Red flower spikes
Foliage of tree - Crown is rounded
Soil Type - Well-drained, sandy soil.
Also grow in clay or loam
Height of tree- 10-15 ft
Diameter of tree- 10 to 15m
Region - Western North America and in colder regions in greenhouses

Uses
- Ornamental landscaping
- Common remedies for treatment of diarrhoea, dysentery and rheumatism







T24 Ashoka *Saraca asoca*

Planted by - Shri J.C.Mohanty
Year of Plantation - 18-01-2017
Family- Legumes

Nature -Evergreen
Climate -Rain-forest tree. Central areas of Deccan plateau
Texture of Bark: Warty surface
Shape & Colour - Leaf: Green colored leaves with oblong shape.
Foliage of tree: Shiny foliage
Height of the tree -10'-15' tall
Diameter of trunk: 3m
Region - Central areas of the Deccan plateau

Uses
- Reduces acne, pimple
- Very useful in gynaecological conditions
- Boosts memory power
- Beneficial in diabetes







T15 Maulsari *Minusops elengi*

Planted by - Ms Krishna Poonia
Year of Plantation - 18-01-2017
Family- Sapotaceae (Mahua family)

Nature -Evergreen
Climate - Summer season
Shape & Colour - Bark: Thick bark and appears dark brown in color
Foliage of tree - Glossy, dark green leaves
Soil Type -Rich free draining loamy and sandy soil with PH of 5.5-6.5
Height of tree- 9-18 m (30-59 ft)
Diameter of trunk -1m (3ft 3in)
Region - Tropical forest in South Asia, Southeast Asia and northern Australia

Uses
- Treatment and maintenance of oral hygiene
- Rinsing mouth with water solution made with bakul helps in strengthening the teeth
- Prevents bad breath
- Keeps gums healthy












T42 Bargad *Ficus benghalensis*

Planted by - Dr. Ramdas M. Pai
Year of Plantation - 21-03-2012
Family- Moraceae

Nature -Evergreen
Climate - Monsoon and rain forests
Texture of leaf- leathery
Shape & Colour - Heart and green
Foliage of tree - Round Foliage
Soil Type - High moisture
Height of tree - up to 30m (100 ft)
Diameter of trunk - spreads laterally indefinitely
Region - south eastern region of India

Uses
- Boosts immunity
- Prevents depression
- Treats vomiting
- Lowers cholesterol
- Prevents inflammation

T19 Bottle Brush *Callistemon*

Planted by - D.S.Chauhan
Year of Plantation - 18-01-2017
Family- Myrtle

Nature - Evergreen
Climate - Temperate regions
Texture of flower- Fury
Shape & Colour - Flower: Red flower spikes
Foliage of tree - Crown is rounded
Soil Type - Well-drained, sandy soil.
Also grow in clay or loam
Height of tree- 10-15 ft
Diameter of tree- 10 to 15m
Region - Western North America and in colder regions in greenhouses

Uses
- Ornamental landscaping
- Common remedies for treatment of diarrhoea, dysentery and rheumatism












T8 Peela Gulmohar *Petrophorum pterocarpum*

Planted by - Dr. D. Srikanth Rao
Year of Plantation - 21st march, 2012
Family- Legumes

Nature -Deciduous
Climate - Tropical warm climate
Leaf Texture - Fern like leaves
Leaf Shape & Colour - Rusty red tomentose.
Foliage Shape - Round
Soil Type - moist, but well drained soil.
Tree Height - Approx. 10 mts.
Bark Diameter - 20-25 mts.
Region - Sri Lanka, the Andamans & Australia

Uses
- Gulmohar is well known for its beautiful flowers.
- It also has some medicinal properties like Anti-diabetic activity, Anti-bacterial activity, Anti-diarrheal property, Hepatoprotective/Cytotoxic property, Anti-microbial activity, Anti-inflammatory activity

T6 Karanja *Millettia pinnata*

Indian sub continent & Southeast Asia

Planted by - Shree Abhay Jain

Year of Plantation - 21st March 2012

Family- Fabaceae



Nature - Evergreen

Climate - Humid & Sub Tropical Region

Leaf Texture - Soft & Shiny

Leaf Shape & Colour - Round & Glossy

Deep Green

Foliage Shape - Round
Soil Type -Sandy stony & clayey

Leaf type- Pinnate

1 Unit - 4 mts

Tree Height - 15 to 25 mts.

Bark Diameter - 50 cms.

Region - Temperate Asia, Australia



Uses

- It is used for landscaping purpuss due to large canopy & snowy fragrant flowers.
- The bark can be used to treat wounds caused by poisonous fish.
- The fruits & sprouts are used in many traditional remedies.
- Its oil known as Pongamia oil is used in soap making & as a lubricant.
- The residue of oil extraction is used as a fertilizer.

T45 Kachnar *Bauhinia variegata*

Eastern Africa

Planted by - Shri Sunil Arora

Year of Plantation - 16-04-2012

Family- Leguminosae - Legumes



Nature - Deciduous

Climate- The desert/desert terrain plain of Western or Eastern Ghats. Plateaus, plains of Ganges, Doab Punjab, eastern ranges, north east zone, high altitudes.

Shape & Colour of tree - Twigs of tree are slender, light green, angled, hairy and brownish grey in colour.

Foliage of tree -Spreading crown and a short bole.

Soil Type - Acid and Neutral

15 M

Uses

- Treat hypothyroidism
- Controls blood sugar
- Treatment of digestive system problems



Zoomed Image



Leaf type



Flower type



T9 Jamun *Eugenia jambolama*

Indian sub continen

Planted by - Brig(Dr.) P.S.Siwach(Retd.)

Year of Plantation - 21st March 2012

Family- Myrtaceae



Nature - Evergreen

Climate - Tropical & Sub Tropical Region

Leaf Texture - Smooth, Leathery

Leaf Shape & Colour - Glossy

Dark Green,Long with Pointy tips

Foliage Shape - Round

Soil Type - Deep Loamy

Tree Height - 30 mts.

Bark Diameter - 40-100 cms

Region - India, Myanmar & Srilanka



Leaf type- Pinnate

1 Unit - 5 mts



Uses

- Jambolan fruits can be eaten raw or are made into jams.
- Fruits have great nutritional value.
- Jambolan is used in medicine for diabetes, swelling of the stomach, constipation, diarrhea & other conditions.
- Jamun fruit is used in treating common cold, cough & flu.
- Jamun fruit helps in regulating blood pressure.
- The tree bark can be used for decoration.

T15 Maulsari *Minusops elengi*

South Asia

Planted by - Ms Krishna Poonia

Year of Plantation - 18-01-2017

Family- Sapotaceae (Mahua family)



Fruit type

Nature -Evergreen

Climate - Summer season

Shape & Colour - Bark: Thick bark and appears dark brown in color

Foliage of tree - Glossy, dark green leaves

Soil Type -Rich free draining loamy and sandy soil with PH of 5.5-8.5

Height of tree- 9-18 m (30-59 ft)

Diameter of trunk -1m (3ft 3in)

Region - Tropical forest in South Asia, Southeast Asia and northern Australia



Zoomed image



Flower type



Leaf type



Uses

- Treatment and maintenance of oral hygiene
- Rinsing mouth with water solution made with bakul helps in strengthening the teeth
- Prevents bad breath
- Keeps gums healthy



MANIPAL UNIVERSITY JAIPUR

WORK ORDER	Date: 20-02-2023
PROJECT	MUJ::: PEBBLES

Vendor Address: JUNGLE THE PLANT YARD 21 Milestone, Bikaner Jaipur Highway, Norangdesher, Bikaner, Rajasthan, 334022		Project Address: MANIPAL UNIVERSITY JAIPUR Dehmi Kalan, Off Jaipur-Ajmer Expressway Jaipur, Rajasthan-303 007	
		Billing Address: MANIPAL UNIVERSITY JAIPUR Dehmi Kalan, Off Jaipur-Ajmer Expressway Jaipur, Rajasthan-303 007	
GST:	08AUXPB7202N2Z4	GST:	08AAAJM1881F1Z6
PAN:	AUXPB7202N	PAN:	AAAJM1881F
Contact Person: Mr. Vijender Bagaria Email: thegardner100@gmail.com Mobile: +91 9649444411		Contact Person: Pushpendra Kumar Sharma Mobile: +91 9116613642 Email: pushpendrakumar.sharma@jaipur.manipal.edu	
Reference: 1. Final offer received through email dated 29-11-2022.			

Scope of Work & Pricing:

Sl No.	Description	Unit	Qty	Rate	Amount (Rs.)
1.	Supplying & Laying of River Pebbles Size: 2" – 3" Approximate Weight: 250-700 Gram Each				
A	Colour: Gray	MT	34	4,200.00	1,42,800.00
B	Colour: White	MT	34	4,200.00	1,42,800.00
Total					2,85,600.00
Add: GST @ 18%					51,408.00
Grand Total					3,37,008.00
Rupees Three Lakhs Thirty-Seven Thousand Eight Only.					
Note: The above value is inclusive of all levies, duties, taxes & GST and exclusive of Labour Cess (1%). No additional charges are applicable/payable for escalation, price variation and other charges. No escalation will be permitted during the progress of works on any account. Item rates in the annexed BOQ will remain constant till Completion of Work.					

Start Date:

Start Date:	22-02-2023
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Completion Date:

Completion Date:	28-02-2023
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Payment Terms:

Payment	a. Payments will be released within 15 days of receipt of materials in totality at Project site and bills duly certified by Project Manager / Consultants
	All payments will be released within 15 working days of submission of bills duly certified by the Project Manager.
	TDS will be deducted as per prevailing rules.
Note: <ul style="list-style-type: none">• All bills to be submitted to Project Site and to be certified by Project Manager, Store In charge.• Each RA bills submitted should have the details of this Work Order & proof of Statutory Documents attached.• All RA bills to accompany measurement sheets jointly signed by your and MUJ Team.• Certification of the bill to be completed within 10 working days from date of submission of bill.	

WORK ORDER TERMS & CONDITIONS

1. **Acceptance of Work Order:** Signing and returning the acknowledgment copy of the Work Order or, in any event of commencement of performance/delivery hereunder or thereunder shall constitute acceptance of Work Order. Acceptance of this order constitutes acceptance of all of the terms and conditions stated herein.
2. **Guarantee/Warranty:** The Comprehensive Warranty Period is One Year (12Months) from the date of completion of works in totality and same being certified by the consultants. You will repair / replace the defective works during this period without any cost to Manipal University Jaipur.
3. **Special Terms:**

Drawings approved by our Consultant **M/s Maser Plan and M/s Architect Hafeez Contractor** will form part of this Work Order and same needs to be strictly followed during working at site. No deviations will be permitted. You are requested to submit the copy of GA / Shop Drawings duly approved by the above-mentioned Consultants at our Office for records.

All tools & tackles required for execution of works to be arranged by contractor.

All mechanization method needs to be adopted for execution of work.

Security of materials at site will be responsibility of contractor.

Site Order book to be maintained at site for day-to-day instructions from Project Manager.

One competent supervisor to be stationed at site immediately till the completion of work.
Site organization chart to be shared for during the execution period.

You should deploy your own equipment's to identify the levels. We will be sharing with the detailed drawings of the area where the work needs to be carried out only for getting the levels.

Boarding/Lodging of your team including site labour will be to your account.

4. **Non-Tendered Item:** Subject to inspection and acceptance, Manipal University Jaipur will be liable for payment only for quantities ordered (Mentioned in BOQ) and delivered unless otherwise specified. Non-Tendered Item must have prior written approval from Project Manager/Purchase Manager of Manipal University Jaipur and rates finalized before start of work. The rate finalization for no-tendered works will be at actual cost plus 15% OHP (Overheads & Profits). Any work done without approval from Project Manager will not be entertained and Manipal University Jaipur will not be liable for payment of NT Items. You are only allowed to work on Specific Block/Area mentioned in Work Order & BOQ. Any work done in any other Blocks/Area will not be entertained.
5. **Drawings:** Vendor shall ensure that all drawings/shades/colour/hardware/Workings etc. and data used have been certified by our Architects, Consultants & Project Manager for construction and that Goods are manufactured according to such drawings and data or any subsequent revisions thereof. Shades/Laminate/Hardware/Workings needs to be approved by our Architect and Project Team. Approval copy of the same to be submitted at our office. All works to be carried out as per the specifications in the annexure and drawings issued by our Architect. No deviations will be permitted. All the working drawings needs to be approved by our Architect & Project Team. Any deviation from the specifications in the annexure will be rejected by Manipal University Jaipur and Change/Replacement to be effected thereof will not be borne by Manipal University Jaipur. You need to coordinate with our Architect and Project Team to obtain the details of execution of work. Both the Architect and the Project team will be checking on the quality of the deliverables and any issue with quality, the work will be rejected.

Kindly coordinate with the Architect **M/s Master Plan** and **M/s Architect Hafeez Contractor** to obtain all final layouts/drawings and details to proceed with execution of works at site as per the start dates mentioned.

6. **Inspection:** Payment for the Goods/Work done provided under the Work Order shall not constitute Acceptance thereof. Manipal University Jaipur may inspect and test such Goods/Work and reject any or all items that are, in Manipal University Jaipur's sole judgment, non-conforming. Goods/Work rejected or supplies in excess of quantities ordered may be returned to Vendor at its expense. Failure by Manipal University Jaipur



to inspect and/or test the Goods shall not be deemed Acceptance by Manipal University Jaipur.

7. **Quality:** If the quality of the finished item/s is not of acceptable standards, the same will be rejected by Manipal University Jaipur without any liability whatsoever. Any works rejected will be dismantled/demolished and redone by the Contractor at its own cost for which no compensation will be paid. All works executed to have approvals from Architect & Project Manager.

The Architect/MUJ shall, during the progress of the works, have power to order in writing from time to time removal from the works within such reasonable time or times as may be specified in the order, of any materials which in the opinion of the Architect are not in accordance with the Specification or the instructions of the Architect, the substitution of proper materials, and the removal and proper re execution of any work executed with materials or workmanship not in accordance with the Drawings and specifications, instruction; and the contractor shall forthwith carry out such order at his own cost. In case of default on the part of the contractor to carry out such order, MUJ shall have the power to employ and pay other persons to carry out the same; and all expenses consequent or incidental thereto as certified by the Architect shall be borne by the Contractor or may be deducted by MUJ from any moneys due or that may be come due to the contractor.

You will be deploying dedicated independent "Team" including experienced "Engineer" at site. Request you to share the details of your "Team" at site.

All mechanization method needs to be adopted for execution of work. Power, Water, Cement, Sand, Scaffolding, Safety Accessories. Etc. used at project site will be to your account. You are requested to share the details of mechanization and equipment to be deployed at site before the start of works and take necessary approvals from Project Manager. Usage of water for construction purpose to be as per norms.

You will be deploying your own security team and you will be responsible for the security of the site. Any theft of property belonging to Manipal University Jaipur/Other agencies due to laxity in security or by your labours will attract penalties apart from recovering the cost of stolen items.

Security of Materials at site will be your responsibility till it gets handed over to Manipal University Jaipur after submission of "Work Completion Report" duly endorsed by Project Manager/Architect/Project Team.

All the materials brought to the site shall become/remains the property of Manipal University Jaipur and shall not be shifted from site without written approval from Project Manager.

As this is to be a LEED/GRIHA certified project, your team to assist in all documentation on the same including implementation of the protocols and site readiness (including cleanliness of site) as per the requirement by the certification agency. Kindly coordinate with our Sustainability Consultant M/s Terravidis to get all the details and templates/procedures to be followed at site.

A handwritten signature in blue ink is located on the left side of the page. To its right, a large blue checkmark is drawn, indicating approval or completion.

8. **Sub-letting:** The whole of the works included in the contract shall be executed by the Contractor and the Contractor shall not directly or indirectly transfer, assign or sublet/the Contract or any part share thereof or interest therein without the written consent of Architect/ MUJ.
9. **Work Programme:** On receipt of this Work Order, the Contractor will have to submit the Work Programme, Bar Chart, PERT/CPM Chart for the approval of the Project Manager. Once approved, all the works will have to be executed as per the agreed schedule. No compensation will be paid to the Contractor for any delay in completion of the work on any account.

Any delay in completion of works after the **Completion Date** will attract penalties which will be levied @ 1% of the Contract Value per week to the maximum of 5% of the Contract Value. (Refer attached terms for details).
10. **BOQ:** Quantities mentioned in the BOQ (Annexed) are approximate. Payments will be made as per actual quantities executed on ground. We reserve the right to add or delete or substitute any work/works within the scope as specified in BOQ for which no additional benefit/compensation will be paid to contractor.
11. **Documentation @ Site:** Contractor to maintain following documents at site:
 - a. **Site Order Book:** Site Order book to be kept at site for issuing necessary instruction to the contractor by Project Manager Or any representative of Manipal University Jaipur.
 - b. **Work Diary:** To keep daily account of labour employed and work executed on day-to-day basis.
12. **Weekly Progress Report:** Weekly Progress Report will have to be submitted by the Contractor in writing to the Project Manager which should include targets for the coming week / next week and progress achieved during the current week.
13. **Cleanliness of Site:** Contractor shall ensure Cleanliness of site. In case we (Project Manager/Project Team) found the work area not in clean condition, same will attract liquidated Damages. Liquidated Damages will be imposed at 1% of the Total Work Value and same will be deducted from RA Bills.
14. **Labour Accommodation:** All codes/guidelines of NBC-2016 to be followed for the labour/worker accommodation at site including instructions issued by Rajasthan State Pollution Control Board and COVID-19 guidelines issued by Government of India/State Government. In case of any default on this account, Manipal University Jaipur reserves the right to take necessary action (including imposing of penalties). Site within the campus will be provided for setting up the labour colony at no cost till original completion period of project only. The site establishment, temporary structures including labour colony shall be removed by the contractor on completion of works.
15. **Safety:** All safety measures including wearing of Helmets, Safety harness, Safety Belts, Goggles and Safety shoes to be strictly followed at site as per instruction of Engineer-In-

Charge. Safety of all your workers working at our project site will be your own responsibility. The Vendor/ Consultant/ Contractor/ alone shall be responsible to take all safety measures due to current COVID-19 Pandemic. In this regard the client shall not be responsible for any act, deed and things which may happen at site or office of the client. No "Child Labour" & "Women Labour" shall be employed by the contractor and should comply all statutory norms.

In case any of your labours found without wearing Safety Shoes, Safety Helmets or any safety accessories and defaulting on safety measure for COVID-19, an amount of Rs. 25,000.00 will be imposed as penalty per incidence.

16. **Insurance:** Vendor shall maintain adequate insurance in any and all forms necessary to protect both Vendor and Manipal University Jaipur against all liabilities, losses, damages, claims, settlements, expenses, and legal fees arising out of or resulting from performance of the Work Order.
17. **Statutory Compliance:** Within 14 days from the receipt of this letter the contractor shall provide Contractor's All Risk Policy Valid till the duration of contract + one month), Workmen Compensation Policy and Third-party Liability policy for the works and will include as endorsement the joint names of the Contractor and the Employer.

The policies to be provided by you shall be in place along with premium payment receipts before you are allowed to physically commence works at site.

Kindly ensure that all workers are covered under the statutory insurances under the Workman's Compensation Act as we will not be liable for damages in the event of any accident. Group Insurance to be taken by you for all workers working at site and a copy of the same to be sent to our office for records.

You shall observe and comply with all laws (PF, ESI, BOCW, etc.) applicable to workmen employed by you or any sub-contractor employer on the works. Relevant documents like Register of PF & ESI coverage for workmen employed at our site & Challan for remittances of PF & ESI for the period of deployment of workmen at our site to be submitted along with bills/invoices. In the event of any default by way of non-observance or non-compliance of the said laws/rules on your part or the sub-contractors, you shall indemnify Manipal University Jaipur against any liabilities and costs/expenses arising out of or in connection therewith. In the event of failure to submit the proof, amount towards the PF/ESI contribution will be deducted from your bill and paid to the respective department.

The contractors should register under the Contract Labour Act, obtain suitable licenses, and follow all the provisions of the contract labour (Abolishment Regulations Act). Prior to commencement of work, Contractor must obtain Labour License for this project.

No "Child Labour" & "Women Labour" permitted at Project Site.

RA Bill payments will be linked with the submission of statutory documents and any delay in submission of documents will delay the payments.

18. **Force Majeure:** If, at any time, during the currency of this Contract, the performance in whole or in part, by either party, of any obligation under this Contract, shall be prevented or delayed by reasons of war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods explosions, epidemic, pandemic, lockdowns, quarantine restrictions, Acts or State or Acts or God, hereinafter referred to as eventualities, then the Contract period will get extended for the period of Force Majeure provided notice of the happenings of any such eventuality is given supported by a certificate of appropriate authority or Chamber of Commerce, by either party to the other, within 15 days from the date of occurrence thereof, neither party shall by reason of such eventuality be entitled to terminate this Contract, nor shall either party have any claim for damages against the other, in respect of such nonperformance or delay in performance and Work under this Contract shall resume as soon as practicable after such eventuality has come to an end or ceased to exist and the decision of the Department as to whether the Work has to be resumed shall be final and conclusive. Should one or both parties be prevented from fulfilling their contractual obligations by a state of Force Majeure lasting continuously for a period of at least three months, the parties shall consult each other regarding further implementation of the contract.

19. **Indemnity:** Contractor/Seller hereby agrees to indemnify and keep Client harmless against and from all costs, claims, damages, expenses, demands, liabilities, causes of action and proceedings of whatever nature, including legal fees on a full indemnity basis, arising from or as a consequence of Contractor's/Seller's breach of any of these terms and conditions or negligence in the supply of any goods and/or services under any Contract or any defect inherent in the goods supplied/service rendered or from infringement of any third party's intellectual property rights in carrying out the supply of any goods and/or services under such Contract.

20. **Termination of Contract:**

If the contractor has abandoned the contract or has failed to proceed with the work with due diligence or the progress of any particular item or is slow or he has failed to execute the work in accordance with the specifications, neglecting to carry out his obligation under the contract, then it shall be lawful for the employer to terminate the contract forthwith under written notice and to proceed with the balance of the work through any other agencies. During the course of execution of the job, in case the contractor has done any substandard work, he shall be asked in writing to dismantle and re-do the same at his own expenses. If the contractor fails to comply with the above instructions immediately, then the employer shall proceed with the above rectification work, through another agency or agencies. Similarly, if the contractor goes slowly on any particular item or items of work, the employer shall have the right to execute this item or items through another agency or agencies, including its own department.

21. **Confidentiality:** Any Work Order placed by Manipal University Jaipur including all accompanying designs, drawings, specifications, and information which may be treated as confidential and in particular the Supplier shall not make use of the Purchaser Name or the name of any companies associated with the Purchaser for publicity purposes without the consent of the Purchaser. Neither Vendor nor any of its subcontractors or affiliates shall cause or allow the name of "Manipal Group" (or any variation thereof) or any Manipal logo or mark, or that of any of its schools, Universities, Hospitals, departments,

or employees to be used in any advertising or promotional literature, electronic or otherwise, or in any publication whatsoever, without prior written approval of Manipal Group.

22. Environmental Clause:

- a. Adherence to all statutory requirements with respect to environment.
- b. Adherence to OCP 1 and OCP 25 while carrying out the work. (The procedures will be made available on request).
- c. Any environmental incidences that occur during the course of your activity shall be reported to Engineer in-charge.

23. Cancellation: Manipal University Jaipur has the right to cancel this Work Order and Contract for convenience, in whole or in part, at any time upon written notice to Contractor. Upon such Cancellation, vendor shall refund to Manipal University Jaipur any amount paid by Manipal University Jaipur under this Work Order.

24. Dispute: Any disputes related to this Work Order shall be subject to Courts of Jaipur Jurisdiction only. This Work Order shall be governed in accordance with the Laws of India.

You are requested to sign (on all pages) and return it to us as a token of acceptance of this Work Order.

Regards,

For Manipal University Jaipur.


Authorized Signatory

CC:

 1. Finance Office, Manipal University Jaipur.

Accepted the Work Order with all Terms & Conditions.

Signature of the Contractor with Date



MANIPAL UNIVERSITY JAIPUR

PURCHASE ORDER	Date: 06-12-2022
PROJECT	MUJ::: Plants Supply

Vendor Address:		Project Address:	
JUNGLE THE PLANT YARD 21 Milestone, Bikaner Jaipur Highway, Norangdesher, Bikaner, Rajasthan, 334022		MANIPAL UNIVERSITY JAIPUR Dehmi Kalan, Off Jaipur-Ajmer Expressway Jaipur, Rajasthan-303 007	
		Billing Address:	
		MANIPAL UNIVERSITY JAIPUR Dehmi Kalan, Off Jaipur-Ajmer Expressway Jaipur, Rajasthan-303 007	
GST:	08AUXPB7202N2Z4	GST:	08AAAJM1881F1Z6
PAN:	AUXPB7202N	PAN:	AAAJM1881F
Contact Person:		Contact Person:	
Mr. Vijender Bagaria Email: thegardner100@gmail.com Mobile: +91 9649444411		Pushpendra Kumar Sharma Mobile: +91 9116613642 Email: pushpendrakumar.sharma@jaipur.manipal.edu	
Reference:			
1. Final offer received through email dated 29-11-2022.			

Scope of Supplies & Pricing:

Sl No.	Description	Amount (Rs.)
1.	Plants Supply at Academic Block-3 of Manipal University Jaipur (Detailed BOQ with specifications annexed to this Order).	12,01,825.00
Total		12,01,825.00
Rupees Twelve Lakhs One Thousand Eight Hundred and Twenty-Five Only.		

Note: The above value is inclusive of GST, Packing, Loading, Transportation, Transit Insurance, Unloading, etc. No additional charges are applicable/payable for escalation, price variation and other charges. Item rates in the annexed BOQ will remain constant till **Completion of Supplies.**

Material Delivery at Project Site	31-12-2022
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Payment Terms:

a. Payments (less Retention @ 5%) will be released within 15 days of handover of materials in totality at Project site and bills duly certified by Project Manager / Consultants.

Payment	b. 5% of the final bill amount will be retained as "Retention Amount" and same will get released on completion of Defect Liability Period (DLP) of 06 (Six) Months from the date completion and handover.
	All payments will be released within 15 working days of submission of bills duly certified by the Project Manager.
<p>Note:</p> <ul style="list-style-type: none"> • All bills to be submitted to Project Site and to be certified by Project Manager, Store In charge. • Each RA bills submitted should have the details of this Purchase Order & proof of Statutory Documents attached. • All RA bills to accompany measurement sheets jointly signed by your and MUJ Team. • All bills for this Purchase Order to be raised from your Jaipur Office. 	

PURCHASE ORDER TERMS & CONDITIONS

1. **Acceptance of Purchase Order:** Signing and returning the acknowledgment copy of this Purchase Order or, in any event of commencement of performance/delivery hereunder or thereunder shall constitute acceptance of Purchase Order. Acceptance of this Purchase Order constitutes acceptance of all of the terms and conditions stated herein.
2. **Guarantee:** Any Plants supplied by you, if found dead with a period of 06 (Six Months) from the date of Supply, will be replaced by you at no extra cost.
3. **Non-Tendered Item:** Subject to inspection and acceptance, Manipal University Jaipur will be liable for payment only for quantities ordered (Mentioned in BOQ) and delivered unless otherwise specified. Non-Tendered Item must have prior written approval from Project Manager/Purchase Manager of Manipal University Jaipur and rates finalized before start of production. Any supplies done without approval from Project Manager will not be entertained and Manipal University Jaipur will not be liable for payment of NT Items.
4. **Drawings:** Vendor shall ensure that all drawings/shades/colour/hardware/Workings etc. and data used have been certified by our Architects, Consultants & Project Manager for construction and that Goods are manufactured according to such drawings and data or any subsequent revisions thereof. Shades/Laminate/Hardware/Workings needs to be approved by our Architect and Project Team. Approval copy of the same to be submitted at our office. All supplies to be carried out as per the specifications in the annexure and drawings issued by our Consultant. No deviations will be permitted. All the working drawings needs to be approved by our Consultants & Project Team. Any deviation from the specifications in the annexure will be rejected by Manipal University Jaipur and Change/Replacement to be effected thereof will not be borne by Manipal University Jaipur. You need to coordinate with our Consultant and Project Team to obtain the details. Both the Consultant and the Project team will be checking on the quality of the deliverables and any issue with quality, the supplies will be rejected.

Kindly coordinate with Architect M/s Master Plan and M/s Architect Hafeez Contractor to obtain all final layouts/drawings and details to proceed with Procurement and delivery at site as per the dates mentioned.

5. **Inspection:** Payment for the Goods provided under the Purchase Order shall not constitute Acceptance thereof. Manipal University Jaipur may inspect and test such Goods and reject any or all items that are, in Manipal University Jaipur's sole judgment, non-conforming. Goods rejected or supplies in excess of quantities ordered may be returned to Vendor at its expense. Failure by Manipal University Jaipur to inspect and/or test the Goods shall not be deemed Acceptance by Manipal University Jaipur.
6. **Quality:** If the quality of the supplied item/s is not of acceptable standards, the same will be rejected by Manipal University Jaipur without any liability whatsoever. Any supplies rejected will be dismantled/demolished and redone by the Supplier at its own cost for which no compensation will be paid. All supplies to have approvals from Consultant & Project Manager.

All the materials brought to the site shall become/remain the property of Manipal University Jaipur and shall not be shifted from site without written approval from Project Manager.

7. **Sub-letting:** The whole of the supplies included in the contract shall be executed by the Supplier and the Supplier shall not directly or indirectly transfer, assign or sublet/the supplies or any part share thereof or interest therein without the written consent of Consultant/MUJ.

Any delay in supplies after the **Delivery Date** will attract penalties which will be levied @ 1% of the Contract Value per week to the maximum of 5% of the Contract Value. (Refer attached terms for details).

8. **BOQ:** Quantities mentioned in the BOQ (Annexed) are approximate. Payments will be made as per actual quantities supplied. We reserve the right to add or delete or substitute any supply/supplies within the scope as specified in BOQ for which no additional benefit/compensation will be paid.
9. **Insurance:** Vendor shall maintain adequate insurance in any and all forms necessary to protect both Vendor and Manipal University Jaipur against all liabilities, losses, damages, claims, settlements, expenses, and legal fees arising out of or resulting from performance of the Purchase Order.
10. **Force Majeure:** If, at any time, during the currency of this Contract, the performance in whole or in part, by either party, of any obligation under this Contract, shall be prevented or delayed by reasons of war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods explosions, epidemic, pandemic, lockdowns, quarantine restrictions, Acts or State or Acts or God, hereinafter referred to as eventualities, then the Contract period will get extended for the period of Force Majeure provided notice of the happenings of any such eventuality is given supported by a certificate of appropriate authority or Chamber of Commerce, by either party to the other, within 15 days from the date of occurrence

thereof, neither party shall by reason of such eventuality be entitled to terminate this Contract, nor shall either party have any claim for damages against the other, in respect of such nonperformance or delay in performance and Supplies under this Contract shall resume as soon as practicable after such eventuality has come to an end or ceased to exist and the decision of the Department as to whether the Supplies has to be resumed shall be final and conclusive. Should one or both parties be prevented from fulfilling their contractual obligations by a state of Force Majeure lasting continuously for a period of at least three months, the parties shall consult each other regarding further implementation of the contract.

11. Indemnity: Contractor/Seller hereby agrees to indemnify and keep Client harmless against and from all costs, claims, damages, expenses, demands, liabilities, causes of action and proceedings of whatever nature, including legal fees on a full indemnity basis, arising from or as a consequence of Contractor's/Seller's breach of any of these terms and conditions or negligence in the supply of any goods and/or services under any Contract or any defect inherent in the goods supplied/service rendered or from infringement of any third party's intellectual property rights in carrying out the supply of any goods and/or services under such Contract.

12. Termination of Contract:

If the supplier has abandoned the contract or has failed to proceed with the supplies with due diligence or the progress of any particular item or is slow or he has failed to execute the supplies in accordance with the specifications, neglecting to carry out his obligation under the contract, then it shall be lawful for the employer to terminate the contract forthwith under written notice and to proceed with the balance of the supplies through any other agencies. During the course of supplies, in case the supplier has done any substandard supplies, he shall be asked in writing to re-supply with correct specification at his own expenses. If the supplier fails to comply with the above instructions immediately, then the employer shall proceed with the supplies through another agency or agencies. Similarly, if the supplier goes slowly on any particular item or items, the employer shall have the right to have supply of this item or items through another agency or agencies, including its own department.

13. Confidentiality: Any Purchase Order placed by Manipal University Jaipur including all accompanying designs, drawings, specifications, and information which may be treated as confidential and in particular the Supplier shall not make use of the Purchaser Name or the name of any companies associated with the Purchaser for publicity purposes without the consent of the Purchaser. Neither Vendor nor any of its subcontractors or affiliates shall cause or allow the name of "Manipal Group" (or any variation thereof) or any Manipal logo or mark, or that of any of its schools, Universities, Hospitals, departments, or employees to be used in any advertising or promotional literature, electronic or otherwise, or in any publication whatsoever, without prior written approval of Manipal Group.

14. Cancellation: Manipal University Jaipur has the right to cancel this Purchase Order and Contract for convenience, in whole or in part, at any time upon written notice to Contractor. Upon such Cancellation, vendor shall refund to Manipal University Jaipur any amount paid by Manipal University Jaipur under this Purchase Order.

15. **Dispute:** Any disputes related to this Purchase Order shall be subject to Courts of Jaipur Jurisdiction only. This Purchase Order shall be governed in accordance with the Laws of India.

You are requested to sign (on all pages) and return it to us as a token of acceptance of this Purchase Order.

Regards,

For Manipal University Jaipur.


Authorized Signatory

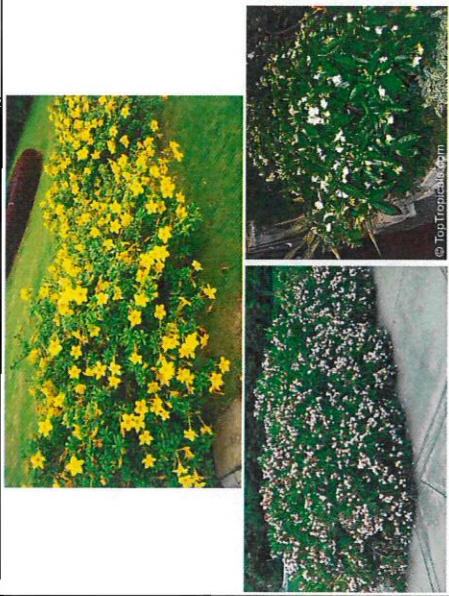
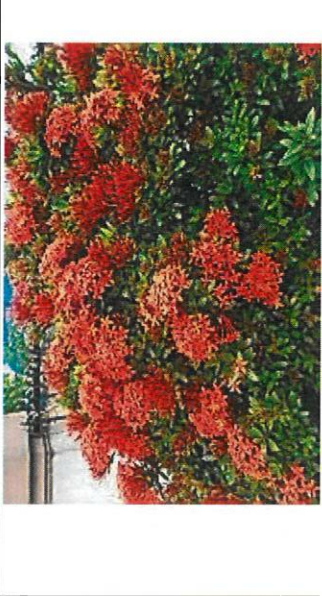

CC:

1. Finance Office, Manipal University Jaipur.

Accepted the Purchase Order with all Terms & Conditions.

Signature of the Contractor with Date




MANIPAL UNIVERSITY JAIPUR
PLANTS SUPPLIES

Item No	Particulars	Unit	Qty	Rate	Amount	Illustrations
A	SOFT LANDSCAPE - GROUND ::: (SUPPLY OF PLANTS)					
1	<p>SHRUBS AND GROUND COVERS Choice of plants * Allamanda nerifolia dwarf - 450mm c/c * Russelia juncea - 450mm c/c * Nerium oleander dwarf - 450mm c/c * Alpinia variegated - 450mm c/c * Phyllanthus myrtifolius - 450mm c/c * Cuphea Hyssopifolia - 450mm c/c * Sterilizia reginae - 450mm c/c or any equivalent * Supply of 9 to 12 month age plants</p>	Sft	18,286.31	45.00	822,884.12	
2	<p>Ixora Coccinea of 9 to 12 month age plants * Supply</p>	Sft	8,925.29	31.80	283,824.33	
3	<p>Plumeria Singaporensis- 5' to 6' tall</p>	Nos	14.00	1,230.00	17,220.00	



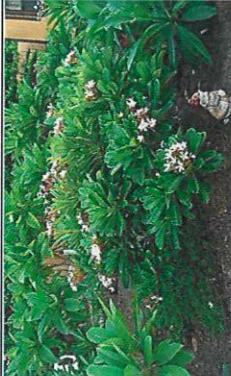


Item No	Particulars	Unit	Qty	Rate	Amount	Illustrations
B	TREES ::: SUPPLY OF TREES					
1	Tecoma Gaudi chaudi- 6' to 8' tall	Nos	22.00	348.00	7,656.00	
2	Lagerstroemia flos reginae - 6' to 8' tall	Nos	13.00	630.00	8,190.00	
3	Dalbergia Sissoo - 6'to 7' tall	Nos	119.00	210.00	24,990.00	
4	Terminalia mentaly - 8' to 10' tall	Nos	56.00	522.00	29,232.00	







Item No	Particulars	Unit	Qty	Rate	Amount	Illustrations
C	SOFT LANDSCAPE - TERRACE ::: SUPPLY OF PLANTS					
1	<u>SHRUBS AND GROUND COVERS</u> Choice of plants * Codium Petra dwarf - 300mm c/c * Nerium oleander dwarf - 600mm c/c or any equivalent * Supply of 9 to 12 month age plants.	Sft	88.11	42.00	3,700.62	
2	Bougainvillea S.P. Singh - 450mm C/C	Nos	40.00	36.00	1,440.00	
3	Plumeria Alba- 5' to 6' tall	Nos	11.00	244.35	2,687.85	
Total					1,201,825.00	



Item No	Particulars	Unit	Qty	Rate	Amount	Illustrations	Remarks
LAND DEVELOPMENT							
1	Supply of Pit soil	Cft	20,474.79	-	-		
2	Supply of Red soil	Cft	6,824.93	-	-		* Supply of red earth & soil (Ratio 70:30) - Assumed average depth of 1'
4	Shifting and filling of soil	Cft	27,299.72	8.50	232,047.60		
5	Levelling and micro grading	Sft	27,299.72	2.50	68,249.29		
6	Supply of Vermi compost	Kg	1,000.00	4.25	4,250.00		
7	Supply of Bio nutrients	Lit	150.00	425.00	63,750.00		
SOFT LANDSCAPE - GROUND							
SHRUBS AND GROUND COVERS							
1	Choice of plants * Allamanda nerifolia dwarf - 450mm c/c * Russelia jurcea - 450mm c/c * Nerium oleander dwarf - 450mm c/c * Alpinia variegated - 450mm c/c * Phyllanthus myrtifolius - 450mm c/c * Cuphea Hyssopifolia - 450mm c/c * Sterlitia reginae - 450mm c/c or any equivalent		18,286.31	30.00	548,589.41		* Soil Preparation * Supply of 9 to 12 month age plants. * Bio nutrients application * Planting will be done according to the growth pattern of plants. * Follow up Maintenance for a period of 180 days
2	Ixora Coccinea	Sft	8,925.29	21.20	189,216.22		* Supply of plants * Pitting * Bio nutrients application * Planting. * Staking. * Follow up free maintenance for a period of 180 Days
3	Plumeria Singaporensis- 5' to 6' tall	Nos	14.00	820.00	11,480.00		* Supply of plants * Pitting * Bio nutrients application * Planting. * Staking. * Follow up free maintenance for a period of 180 Days



Item No	Particulars	Unit	Qty	Rate	Amount	Illustrations	Remarks
4	TREES						
	Tecoma Gaudi chaudi- 6' to 8' tall	Nos	22.00	232.00	5,104.00		
	Lagerstroemia flos reginae - 6' to 8' tall	Nos	13.00	420.00	5,460.00		
	Dalbergia Sissoo - 6'to 7' tall	Nos	119.00	140.00	16,660.00		* Supply of trees * Pitting * Bio nutrients application * Planting. * Staking. * Follow up free maintenance for a period of 180 Days
	Terminalia mentaly - 8' to 10' tall	Nos	56.00	348.00	19,488.00		

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Item No	Particulars	Unit	Qty	Rate	Amount	Illustrations	Remarks
II	SOFT LANDSCAPE - TERRACE						
1	SHRUBS AND GROUND COVERS Choice of plants * Codium Petra dwarf - 300mm c/c * Nerium oleander dwarf - 600mm c/c or any equivalent	Sft	88.11	28.00	2,467.08		<ul style="list-style-type: none"> * Soil Preparation * Supply of 9 to 12 month age plants. * Bio nutrients application * Planting will be done according to the growth pattern of plants. * Follow up Maintenance for a period of 180 days
2	Bougainvillea S.P. Singh - 450mm C/C	Nos	40.00	24.00	960.00		<ul style="list-style-type: none"> * Supply of plants * Pitting * Bio nutrients application * Planting. * Staking. * Follow up free maintenance for a period of 180 Days
3	Plumeria Alba- 5' to 6' tall	Nos	11.00	162.90	1,791.90		<ul style="list-style-type: none"> * Supply of plants * Pitting * Bio nutrients application * Planting. * Staking. * Follow up free maintenance for a period of 180 Days
Total					1,169,514.00		
Add: GST @ 18%					210,512.52		
Grand Total					1,380,026.52		






MANIPAL UNIVERSITY JAIPUR

WORK ORDER	Date: 06-12-2022
PROJECT	MUJ ::: SOFTSCAPE WORKS

Vendor Address:		Project Address:	
JUNGLE THE PLANT YARD 21 Milestone, Bikaner Jaipur Highway, Norangdesher, Bikaner, Rajasthan, 334022		MANIPAL UNIVERSITY JAIPUR Dehmi Kalan, Off Jaipur-Ajmer Expressway Jaipur, Rajasthan-303 007	
		Billing Address:	
		MANIPAL UNIVERSITY JAIPUR Dehmi Kalan, Off Jaipur-Ajmer Expressway Jaipur, Rajasthan-303 007	
GST:	08AUXPB7202N2Z4	GST:	08AAAJM1881F1Z6
PAN:	AUXPB7202N	PAN:	AAAJM1881F
Contact Person:		Contact Person:	
Mr. Vijender Bagaria Email: thegardner100@gmail.com Mobile: +91 9649444411		Pushpendra Kumar Sharma Mobile: +91 9116613642 Email: pushpendrakumar.sharma@jaipur.manipal.edu	
Reference:			
1. Final offer received through email dated 29-11-2022.			

Scope of Work & Pricing:

SI No.	Description	Amount (Rs.)
1.	Softscape Works at Academic Block-3 of Manipal University Jaipur. (Detailed BOQ with specifications annexed to this Order).	13,80,026.52
Total		13,80,026.52
Rupees Thirteen Lakhs Eighty Thousand Twenty-Six and Fifty-Two Paise Only.		
Note: The above value is inclusive of all levies, duties, taxes & GST and exclusive of Labour Cess (1%). No additional charges are applicable/payable for escalation, price variation and other charges. No escalation will be permitted during the progress of works on any account. Item rates in the annexed BOQ will remain constant till Completion of Work.		

Start Date:

Start Date:	15-12-2022
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Completion Date:

Completion Date:	31-01-2023
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Payment Terms:

Payment	a. RABs payment will be done as under on monthly basis: 50% of the amount will be paid after three months of completion of works in totality.
	b. Balance 50% of the amount will be paid after Six months of completion of works in totality.
	All payments will be released within 15 working days of submission of bills duly certified by the Project Manager. TDS will be deducted as per prevailing rules.
Note: <ul style="list-style-type: none">• All bills to be submitted to Project Site and to be certified by Project Manager, Store In charge.• Each RA bills submitted should have the details of this Work Order & proof of Statutory Documents attached.• All RA bills to accompany measurement sheets jointly signed by your and MUJ Team.• Certification of the bill to be completed within 10 working days from date of submission of bill.	

WORK ORDER TERMS & CONDITIONS

1. **Acceptance of Work Order:** Signing and returning the acknowledgment copy of the Work Order or, in any event of commencement of performance/delivery hereunder or thereunder shall constitute acceptance of Work Order. Acceptance of this order constitutes acceptance of all of the terms and conditions stated herein.
2. **Guarantee/Warranty:** The Comprehensive Warranty Period is One Year (12Months) from the date of completion of works in totality and same being certified by the consultants. You will repair / replace the defective works during this period without any cost to Manipal University Jaipur.
3. **Special Terms:**

Drawings approved by our Consultant **M/s Maser Plan and M/s Architect Hafeez Contractor** will form part of this Work Order and same needs to be strictly followed during working at site. No deviations will be permitted. You are requested to submit the copy of GA / Shop Drawings duly approved by the above-mentioned Consultants at our Office for records.

All tools & tackles required for execution of works to be arranged by contractor.

All mechanization method needs to be adopted for execution of work.



Security of materials at site will be responsibility of contractor.

Site Order book to be maintained at site for day-to-day instructions from Project Manager.

One competent supervisor to be stationed at site immediately till the completion of work. Site organization chart to be shared for during the execution period and six months maintenance period.

You should deploy your own equipment's to identify the levels. We will be sharing with the detailed drawings of the area where the work needs to be carried out only for getting the levels.

Boarding/Lodging of your team including site labour will be to your account.

Free maintenance period for the planted plants (Trees, Shrubs, Ground Covers, Creepers, Grasses, etc.) will for a period of six months from the date of completion. The completion dates will be determined in consultation with the Architect & Project Manager.

All Mortality, Labour, Manpower, Tools & Tackles, Machineries, Manures, Fertilizers, Pesticides, Weedicides, etc., will be in your scope for the period of 06 (Six) months. Cost for the same is already factored in above costing. No extra cost is payable due to any changes.

Watering of the Trees/Plants for the area where trees, shrubs, ground covers, creepers, grasses, etc. planted by you will be to your account. This will be a continuous process for a period of 06 (Six) months from the completion date. Same to happen during the execution till the completion of plantation.

Any trees, shrubs, ground covers, creepers, grasses, etc. planted by you, if found dead with a period of 06 (Six) months from the date of completion of plantation, will be replaced by you at no extra cost.

Sufficient place will be provided for setting up the nursery in campus in proximity with the water source. However, all arrangements for setting up and maintaining the nursery will be to your account. Once the works get completed, the space provided for nursery will have to be cleaned and handed over back as per the instruction of Project Manager. This nursery will be exclusively catering to the requirement of our campus.

- 4. Non-Tendered Item:** Subject to inspection and acceptance, Manipal University Jaipur will be liable for payment only for quantities ordered (Mentioned in BOQ) and delivered unless otherwise specified. Non-Tendered Item must have prior written approval from Project Manager/Purchase Manager of Manipal University Jaipur and rates finalized before start of work. The rate finalization for no-tendered works will be at actual cost plus 15% OHP (Overheads & Profits). Any work done without approval from Project Manager will not be entertained and Manipal University Jaipur will not be liable for payment of NT Items. You are only allowed to work on Specific Block/Area mentioned in Work Order & BOQ. Any work done in any other Blocks/Area will not be entertained.



5. **Drawings:** Vendor shall ensure that all drawings/shades/colour/hardware/Workings etc. and data used have been certified by our Architects, Consultants & Project Manager for construction and that Goods are manufactured according to such drawings and data or any subsequent revisions thereof. Shades/Laminate/Hardware/Workings needs to be approved by our Architect and Project Team. Approval copy of the same to be submitted at our office. All works to be carried out as per the specifications in the annexure and drawings issued by our Architect. No deviations will be permitted. All the working drawings needs to be approved by our Architect & Project Team. Any deviation from the specifications in the annexure will be rejected by Manipal University Jaipur and Change/Replacement to be effected thereof will not be borne by Manipal University Jaipur. You need to coordinate with our Architect and Project Team to obtain the details of execution of work. Both the Architect and the Project team will be checking on the quality of the deliverables and any issue with quality, the work will be rejected.

Kindly coordinate with the Architect **M/s Master Plan** and **M/s Architect Hafeez Contractor** to obtain all final layouts/drawings and details to proceed with execution of works at site as per the start dates mentioned.

6. **Inspection:** Payment for the Goods/Work done provided under the Work Order shall not constitute Acceptance thereof. Manipal University Jaipur may inspect and test such Goods/Work and reject any or all items that are, in Manipal University Jaipur's sole judgment, non-conforming. Goods/Work rejected or supplies in excess of quantities ordered may be returned to Vendor at its expense. Failure by Manipal University Jaipur to inspect and/or test the Goods shall not be deemed Acceptance by Manipal University Jaipur.
7. **Quality:** If the quality of the finished item/s is not of acceptable standards, the same will be rejected by Manipal University Jaipur without any liability whatsoever. Any works rejected will be dismantled/demolished and redone by the Contractor at its own cost for which no compensation will be paid. All works executed to have approvals from Architect & Project Manager.

The Architect/MUJ shall, during the progress of the works, have power to order in writing from time to time removal from the works within such reasonable time or times as may be specified in the order, of any materials which in the opinion of the Architect are not in accordance with the Specification or the instructions of the Architect, the substitution of proper materials, and the removal and proper re execution of any work executed with materials or workmanship not in accordance with the Drawings and specifications, instruction; and the contractor shall forthwith carry out such order at his own cost. In case of default on the part of the contractor to carry out such order, MUJ shall have the power to employ and pay other persons to carry out the same; and all expenses consequent or incidental thereto as certified by the Architect shall be borne by the Contractor or may be deducted by MUJ from any moneys due or that may be come due to the contractor.

You will be deploying dedicated independent "Team" including experienced "Engineer" at site. Request you to share the details of your "Team" at site.

All mechanization method needs to be adopted for execution of work. Power, Water, Cement, Sand, Scaffolding, Safety Accessories. Etc. used at project site will be to your account. You are requested to share the details of mechanization and equipment to be deployed at site before the start of works and take necessary approvals from Project Manager. Usage of water for construction purpose to be as per norms.

You will be deploying your own security team and you will be responsible for the security of the site. Any theft of property belonging to Manipal University Jaipur/Other agencies due to laxity in security or by your labours will attract penalties apart from recovering the cost of stolen items.

Security of Materials at site will be your responsibility till it gets handed over to Manipal University Jaipur after submission of "Work Completion Report" duly endorsed by Project Manager/Architect/Project Team.

All the materials brought to the site shall become/remain the property of Manipal University Jaipur and shall not be shifted from site without written approval from Project Manager.

As this is to be a LEED/GRIHA certified project, your team to assist in all documentation on the same including implementation of the protocols and site readiness (including cleanliness of site) as per the requirement by the certification agency. Kindly coordinate with our Sustainability Consultant M/s Terravidis to get all the details and templates/procedures to be followed at site.

8. **Sub-letting:** The whole of the works included in the contract shall be executed by the Contractor and the Contractor shall not directly or indirectly transfer, assign or sublet/the Contract or any part share thereof or interest therein without the written consent of Architect/ MUJ.
9. **Work Programme:** On receipt of this Work Order, the Contractor will have to submit the Work Programme, Bar Chart, PERT/CPM Chart for the approval of the Project Manager. Once approved, all the works will have to be executed as per the agreed schedule. No compensation will be paid to the Contractor for any delay in completion of the work on any account.

Any delay in completion of works after the **Completion Date** will attract penalties which will be levied @ 1% of the Contract Value per week to the maximum of 5% of the Contract Value. (Refer attached terms for details).

10. **BOQ:** Quantities mentioned in the BOQ (Annexed) are approximate. Payments will be made as per actual quantities executed on ground. We reserve the right to add or delete or substitute any work/works within the scope as specified in BOQ for which no additional benefit/compensation will be paid to contractor.

11. **Documentation @ Site:** Contractor to maintain following documents at site:

- a. **Site Order Book:** Site Order book to be kept at site for issuing necessary instruction to the contractor by Project Manager Or any representative of Manipal University Jaipur.

- b. **Work Diary:** To keep daily account of labour employed and work executed on day-to-day basis.
12. **Weekly Progress Report:** Weekly Progress Report will have to be submitted by the Contractor in writing to the Project Manager which should include targets for the coming week / next week and progress achieved during the current week.
13. **Cleanliness of Site:** Contractor shall ensure Cleanliness of site. In case we (Project Manager/Project Team) found the work area not in clean condition, same will attract liquidated Damages. Liquidated Damages will be imposed at 1% of the Total Work Value and same will be deducted from RA Bills.
14. **Labour Accommodation:** All codes/guidelines of NBC-2016 to be followed for the labour/worker accommodation at site including instructions issued by Rajasthan State Pollution Control Board and COVID-19 guidelines issued by Government of India/State Government. In case of any default on this account, Manipal University Jaipur reserves the right to take necessary action (including imposing of penalties). Site within the campus will be provided for setting up the labour colony at no cost till original completion period of project only. The site establishment, temporary structures including labour colony shall be removed by the contractor on completion of works.
15. **Safety:** All safety measures including wearing of Helmets, Safety harness, Safety Belts, Goggles and Safety shoes to be strictly followed at site as per instruction of Engineer-In-Charge. Safety of all your workers working at our project site will be your own responsibility. The Vendor/ Consultant/ Contractor/ alone shall be responsible to take all safety measures due to current COVID-19 Pandemic. In this regard the client shall not be responsible for any act, deed and things which may happen at site or office of the client. No "Child Labour" & "Women Labour" shall be employed by the contractor and should comply all statutory norms.

In case any of your labours found without wearing Safety Shoes, Safety Helmets or any safety accessories and defaulting on safety measure for COVID-19, an amount of **Rs. 25,000.00** will be imposed as penalty per incidence.

16. **Insurance:** Vendor shall maintain adequate insurance in any and all forms necessary to protect both Vendor and Manipal University Jaipur against all liabilities, losses, damages, claims, settlements, expenses, and legal fees arising out of or resulting from performance of the Work Order.
17. **Statutory Compliance:** Within 14 days from the receipt of this letter the contractor shall provide Contractor's All Risk Policy Valid till the duration of contract + one month), Workmen Compensation Policy and Third-party Liability policy for the works and will include as endorsement the joint names of the Contractor and the Employer.

The policies to be provided by you shall be in place along with premium payment receipts before you are allowed to physically commence works at site.



Kindly ensure that all workers are covered under the statutory insurances under the Workman's Compensation Act as we will not be liable for damages in the event of any accident. Group Insurance to be taken by you for all workers working at site and a copy of the same to be sent to our office for records.

You shall observe and comply with all laws (PF, ESI, BOCW, etc.) applicable to workmen employed by you or any sub-contractor employer on the works. Relevant documents like Register of PF & ESI coverage for workmen employed at our site & Challan for remittances of PF & ESI for the period of deployment of workmen at our site to be submitted along with bills/invoices. In the event of any default by way of non-observance or non-compliance of the said laws/rules on your part or the sub-contractors, you shall indemnify Manipal University Jaipur against any liabilities and costs/expenses arising out of or in connection therewith. In the event of failure to submit the proof, amount towards the PF/ESI contribution will be deducted from your bill and paid to the respective department.

The contractors should register under the Contract Labour Act, obtain suitable licenses, and follow all the provisions of the contract labour (Abolishment Regulations Act). Prior to commencement of work, Contractor must obtain Labour License for this project.

No "Child Labour" & "Women Labour" permitted at Project Site.

RA Bill payments will be linked with the submission of statutory documents and any delay in submission of documents will delay the payments.

18. **Force Majeure:** If, at any time, during the currency of this Contract, the performance in whole or in part, by either party, of any obligation under this Contract, shall be prevented or delayed by reasons of war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods explosions, epidemic, pandemic, lockdowns, quarantine restrictions, Acts or State or Acts or God, hereinafter referred to as eventualities, then the Contract period will get extended for the period of Force Majeure provided notice of the happenings of any such eventuality is given supported by a certificate of appropriate authority or Chamber of Commerce, by either party to the other, within 15 days from the date of occurrence thereof, neither party shall by reason of such eventuality be entitled to terminate this Contract, nor shall either party have any claim for damages against the other, in respect of such nonperformance or delay in performance and Work under this Contract shall resume as soon as practicable after such eventuality has come to an end or ceased to exist and the decision of the Department as to whether the Work has to be resumed shall be final and conclusive. Should one or both parties be prevented from fulfilling their contractual obligations by a state of Force Majeure lasting continuously for a period of at least three months, the parties shall consult each other regarding further implementation of the contract.

19. **Indemnity:** Contractor/Seller hereby agrees to indemnify and keep Client harmless against and from all costs, claims, damages, expenses, demands, liabilities, causes of action and proceedings of whatever nature, including legal fees on a full indemnity basis, arising from or as a consequence of Contractor's/Seller's breach of any of these terms and conditions or negligence in the supply of any goods and/or services under any Contract or any defect inherent in the goods supplied/service rendered or from infringement of any

third party's intellectual property rights in carrying out the supply of any goods and/or services under such Contract.

20. Termination of Contract:

If the contractor has abandoned the contract or has failed to proceed with the work with due diligence or the progress of any particular item or is slow or he has failed to execute the work in accordance with the specifications, neglecting to carry out his obligation under the contract, then it shall be lawful for the employer to terminate the contract forthwith under written notice and to proceed with the balance of the work through any other agencies. During the course of execution of the job, in case the contractor has done any substandard work, he shall be asked in writing to dismantle and re-do the same at his own expenses. If the contractor fails to comply with the above instructions immediately, then the employer shall proceed with the above rectification work, through another agency or agencies. Similarly, if the contractor goes slowly on any particular item or items of work, the employer shall have the right to execute this item or items through another agency or agencies, including its own department.

21. Confidentiality: Any Work Order placed by Manipal University Jaipur including all accompanying designs, drawings, specifications, and information which may be treated as confidential and in particular the Supplier shall not make use of the Purchaser Name or the name of any companies associated with the Purchaser for publicity purposes without the consent of the Purchaser. Neither Vendor nor any of its subcontractors or affiliates shall cause or allow the name of "Manipal Group" (or any variation thereof) or any Manipal logo or mark, or that of any of its schools, Universities, Hospitals, departments, or employees to be used in any advertising or promotional literature, electronic or otherwise, or in any publication whatsoever, without prior written approval of Manipal Group.

22. Environmental Clause:

- a. Adherence to all statutory requirements with respect to environment.
- b. Adherence to OCP 1 and OCP 25 while carrying out the work. (The procedures will be made available on request).
- c. Any environmental incidences that occur during the course of your activity shall be reported to Engineer in-charge.


23. Cancellation: Manipal University Jaipur has the right to cancel this Work Order and Contract for convenience, in whole or in part, at any time upon written notice to Contractor. Upon such Cancellation, vendor shall refund to Manipal University Jaipur any amount paid by Manipal University Jaipur under this Work Order.

24. Dispute: Any disputes related to this Work Order shall be subject to Courts of Jaipur Jurisdiction only. This Work Order shall be governed in accordance with the Laws of India.

You are requested to sign (on all pages) and return it to us as a token of acceptance of this Work Order.

Regards,

For Manipal University Jaipur.


Authorized Signatory

CC:

1. Finance Office, Manipal University Jaipur.

Accepted the Work Order with all Terms & Conditions.

Signature of the Contractor with Date

**FACULTY OF MANAGEMENT AND
COMMERCE SCHOOL OF BUSINESS
AND COMMERCE BUSINESS
ADMINISTRATION**

Plantation Drive

09/09/2022

1. Introduction of the Event

School of Business and Commerce organized a plantation drive in association with Directorate of Student welfare and NCC and NSS on 9th September 2022.

2. Objective of the Event

School of Business and Commerce in association with Directorate of Student Welfare, NCC and NSS organised a plantation drive on 9/09/22. The event was organised to create awareness about the ecological balance and to highlight the importance of plantation.

3. Beneficiaries of the Event

- Students
- Faculties
- General Public

4. Details of the Guests

During the event, Group captain Neeraj Amba, 1Raj Air SQN NCC Jaipur was the chief guest. Faculties of school of business and commerce were also present with the students. NCC officer Mr. Sanjeev Sharma was the coordinator from NCC and NSS.

5. Brief Description of the event

The event was conducted on 9th September 2022. During the event students of School of Business and commerce along with NCC and NSS volunteers planted trees in the NCC Jaipur Campus. The chief guest of the event was Group captain Neeraj Amba, 1Raj Air SQN NCC Jaipur. The plantation drive started with a welcome speech by the chief guest in which he encouraged the students to participate in community services and social welfare. Then students and teachers planted trees across the campus. The drive emphasised on creating more and more green spots in the city and contribute towards the environment protection.

6. Photographs of the event



Figure 1MUJ students walk for Plantation Drive



Figure 2 Planting the trees



Figure 3 Understanding the importance of nature

7. Attendance of the Event Total attendee- 83

S.NO	NAME	CLASS
1	Devesh Kumpawat	BBA III-D
2	Jaytiraj Singh	BBA III-D
3	Pranjal Sethi	BBA III-D
4	Harsh Mittal	BBA III-D
5	Dev Gupta	BBA III-D
6	Pulkit Arora	BBA III-D
7	Rahul Choudhary	BBA III-D
8	Naman Gupta	BBA III-D
9	Divyansh Bubana	BBA III-A
10	Mansi Bagaria	BBA III-B
11	Mishu Mathur	BBA III-B
12	Akshita Manuel	BBA III-B
13	Jasmine Tansukhani	BBA III-B
14	Bhavya Khandelwal	BBA III-B
15	Charchita Tanwar	BBA III-E
16	Manav Sankhla	BBA III-E
17	Hitesh Makhijani	BBA III-E
18	Nihal Singh	BBA III-E
19	Pranjal Jain	BBA III-D
20	Jayansh Sharma	BBA III-C
21	Sanskriti Sharma	B.com Honours III-A
22	Riya Lohia	B.com Honours III-A
23	Simran Kaur	B.com Honours III-A
24	Dhruvi Choudhary	BBA III-D
25	Pragya Jain	B.com Honours III-B
26	Harsh Kumar Singh	B.com Honours III-B
27	Palak Agarwal	B.com Honours III-B
28	Varsha Agarwal	B.com Honours III-B
29	Divyansh	B.com Honours III-A
30	Ashish	B.com Honours III-A
31	Deepak	B.com Honours III-A
32	Ambudhi	B.com Honours III-A
33	Tanisha	B.com Honours III-A
34	Sarjan Mahajan	BBA III-A
35	Harshit Hirawat	BBA III-A
36	Divyanshu Patodia	BBA III-A
37	Sanjay Choudhary	BBA III-A
38	Abhay Pratap Singh	B.com Honours V
39	Saksham Jain	BBA V-C
40	Urvashi T Purswany	BBA V-C
41	Tejesvi Purohit	BBA V-C
42	Lakshay Mahipal	BBA V-C
43	Devansh Goyal	BBA V-C
44	Prakhar Modi	BBA V-C
45	Tarun Agarwal	BBA III-D



S.NO	NAME	CLASS
46	Yajat tak	BBA III-C
47	Aditijain	BBA III-C
48	Pakhi Agrawal	BBA III-C
49	Tanishq halidiya	BBA III-C
50	Shyam sundar	BBA III-C
51	Devansh khurana	BBA III-C
52	Shreyansh Maheswari	BBA III-C
53	Ramay Mehta	BBA III-C
54	Mohit Bhiwaniwala	BBA III-D
55	Geetika Sharma	BBA III-D
56	Yash Agarwal	BBA III-D
57	Aditi Jain	BBA III-D
58	Vishal Agarwal	BBA III-D
59	Ishaan gill	BBA III-D
60	Akshat choudhary	BBA III-D
61	Ishita Rajpal	BBA III-D

B. Patel

Head
Department of Business Administration
Manipal University Jaipur



**MANIPAL UNIVERSITY
JAIPUR**
(University under Section 2(f) of the UGC Act)

FACULTY OF DESIGN

SCHOOL OF ARCHITECTURE AND DESIGN

“Tree Plantation Drive” at Govt. School, Bagru

ON 13 Dec 2022

Date of Event 13 Dec 2022



Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the participants
5. Photographs
6. Brochure or creative of the event
7. Attendance of the Event

1. Introduction of the Event

As part of Society Connect Initiative, Directorate of Student Welfare, School of Architecture & Design and NSS organized a TREE PLANTATION DRIVE at Govt. School Bagru. The Directorate of Student Welfare and students of School of Architecture & Design played an important role in this campaign. The plantation was done under the patronage of Ar. Sidharth Soni, Assistant Professor from School of Architecture and Design. The event was attended by students of MUJ and students from School.

2. Objective of the Event

- To conduct plantation drive in local schools for environmental conservation.
- To involve students of MUJ and students from local school to develop a sense of belongingness.

3. Beneficiaries of the Event

Students, and staff members of Govt. School, Bagru

4. Details of the Participants

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
6	220501005	MOULESH M R
7	220501008	PRANAT KOTHARI
8	220501010	AARYA CHANDIRAMANI
9	220501011	NEHAL JAIN
10	220501012	ANKITA SHRIVASTAVA
11	220501013	DIGVIJAY SINGH PANWAR
12	220501014	SHRIYA PAWAR
13	220501015	TANUJ TYAGI
14	220501016	BHAVYA RANKA
15	220501018	HARSHITA MUNDHRA
16	220501019	RISHABH PATHAK
17	220501020	TANYA NIKHIL PURI
18	220501021	IKSHITA BAGLA
19	220501022	ARGHYA B S BHAGWAT
20	220501023	VANSHIKA SHARMA



5. Photographs of the event or screenshots of the event with captions



Students of MUJ planting tree saplings with faculty members from MUJ at Govt. School Bagru on 9th Dec 2022



6. Brochure or creative of the event



7. Attendance of the Event

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
6	220501005	MOULESH M R
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15	220501018	HARSHITA MUNDHRA
16	220501019	RISHABH PATHAK
17	220501020	TANYA NIKHIL PURI
18	220501021	IKSHITA BAGLA
19	220501022	ARGHYA B S BHAGWAT
20	220501023	VANSHIKA SHARMA



Govt. High Secondary School, Bagru

Letter of Appreciation

On 13th December 2023, Manipal University Jaipur organized a TREE PLANTATION DRIVE in association with NSS (National Service Scheme), DSW (Directorate of Student Welfare, MUJ) and SA&D (School of Architecture & Design) in the campus of Govt. School Sanjharia, Bagru.

Tree plantation drive was conducted by Ar. Sidharth Soni, MUJ alongwith Students's of first yr. Architecture and Students from the Govt. School, Bagru.

We highly appreciate efforts of Manipal University Jaipur for conducting TREE PLANTATION DRIVE in the campus of Govt. School Bagru, Jaipur.

Govt. School, Bagru

Date

10/12/2022

PRINCIPAL

MAHATMA GANDHI

GOVT. SCHOOL, SANGANER

NP BAGRU, JAIPUR 08121216008

Link of the Report:

[https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tree
%20 Plantation-%20Bagru%201.pdf](https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tree%20Plantation-%20Bagru%201.pdf)



**MANIPAL UNIVERSITY
JAIPUR**
(University under Section 2(f) of the UGC Act)

FACULTY OF DESIGN

SCHOOL OF ARCHITECTURE AND DESIGN

**“Tree Plantation Drive” at Govt. School, Begas
ON 09 Dec 2022**

Date of Event 09 Dec 2022

Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the participants
5. Photographs
6. Brochure or creative of the event
7. Attendance of the Event

1. Introduction of the Event

As part of Society Connect Initiative, Directorate of Student Welfare, School of Architecture & Design and NSS organized a TREE PLANTATION DRIVE at Govt. School Begas. The Directorate of Student Welfare and students of School of Architecture & Design played an important role in this campaign. The plantation was done under the patronage of Ar. Sidharth Soni, Assistant Professor from School of Architecture and Design. The event was attended by students of MUJ and students from School.

2. Objective of the Event

- To conduct plantation drive in local schools for environmental conservation.
- To involve students of MUJ and students from local school to develop a sense of belongingness.

3. Beneficiaries of the Event

Students, and staff members of Govt. School, Begas

4. Details of the Participants

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
6	220501005	MOULESH M R
7	220501008	PRANAT KOTHARI
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10	220501012	ANKITA SHRIVASTAVA
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15	220501018	HARSHITA MUNDHRA
16	220501019	RISHABH PATHAK
17	220501020	TANYA NIKHIL PURI
18	220501021	IKSHITA BAGLA
19	220501022	ARGHYA B S BHAGWAT
20	220501023	VANSHIKA SHARMA

5. Photographs of the event or screenshots of the event with captions



Students of MUJ planting tree saplings with faculty members from MUJ at Govt. School Begas on 9th Dec 2022

6. Brochure or creative of the event



7. Attendance of the Event

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
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20	220501023	VANSHIKA SHARMA



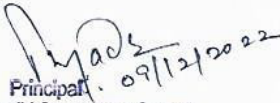
Mahatma Gandhi Govt. School, Begas

Letter of Appreciation

On 9th December 2023, Manipal University Jaipur organized a TREE PLANTATION DRIVE in association with NSS (National Service Scheme), DSW (Directorate of Student Welfare, MUJ) and SA&D (School of Architecture & Design) in the campus of Mahatma Gandhi Govt. School, Begas, Jaipur.

Tree plantation drive was conducted by Ar. Sidharth Soni, MUJ alongwith Students's of first yr. Architecture and Students from the Mahatma Gandhi Govt. School, Begas.

We highly appreciate efforts of Manipal University Jaipur for conducting TREE PLANTATION DRIVE in the campus of Mahatma Gandhi Govt. School, Begas.


Principal. 09/12/2022
Mahatma Gandhi Government School
(English Medium)
Begas

Mahatma Gandhi Govt. School, Begas

Date

Link of the report:

<https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tree%20Plantation-%20Begas.pdf>





**MANIPAL UNIVERSITY
JAIPUR**
(University under Section 2(f) of the UGC Act)

FACULTY OF DESIGN

SCHOOL OF ARCHITECTURE AND DESIGN

**“Tree Plantation Drive” at Govt. School, Dehmikalan
ON 09 Dec 2022**

Date of Event 09 Dec 2022



Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the participants
5. Photographs
6. Brochure or creative of the event
7. Attendance of the Event



1. Introduction of the Event

As part of Society Connect Initiative, Directorate of Student Welfare, School of Architecture & Design and NSS organized a TREE PLANTATION DRIVE at Govt. School Dehmikalan. The Directorate of Student Welfare and students of School of Architecture & Design played an important role in this campaign. The plantation was done under the patronage of Ar. Sidharth Soni, Assistant Professor from School of Architecture and Design. The event was attended by students of MUJ and students from School.

2. Objective of the Event

- To conduct plantation drive in local schools for environmental conservation.
- To involve students of MUJ and students from local school to develop a sense of belongingness.

3. Beneficiaries of the Event

Students, and staff members of Govt. School, Dehmikalan

4. Details of the Participants

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
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13	220501015	TANUJ TYAGI



14 220501016	BHAVYA RANKA
15 220501018	HARSHITA MUNDHRA
16 220501019	RISHABH PATHAK
17 220501020	TANYA NIKHIL PURI
18 220501021	IKSHITA BAGLA
19 220501022	ARGHYA B S BHAGWAT
20 220501023	VANSHIKA SHARMA

5. Photographs of the event or screenshots of the event with captions



Students of MUJ planting tree saplings with faculty members from MUJ at Govt. School Dehmikalan on 9th Dec 2022

6. Brochure or creative of the event



7. Attendance of the Event

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
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20	220501023	VANSHIKA SHARMA




Govt. High Secondary School, Dehmikalan

Letter of Appreciation

On 9th December 2023, Manipal University Jaipur organized a TREE PLANTATION DRIVE in association with NSS (National Service Scheme), DSW (Directorate of Student Welfare, MUJ) and SA&D (School of Architecture & Design) in the campus of Govt. School Dehmikalan, Jaipur.

Tree plantation drive was conducted by Ar. Sidharth Soni, MUJ along with Students' of first yr. Architecture and Students from the Govt. School Dehmikalan.

We highly appreciate efforts of Manipal University Jaipur for conducting TREE PLANTATION DRIVE in the campus of Govt. School Dehmikalan, Jaipur.



PRINCIPAL
Govt. School Dehmikalan
M.G.S. (Eng. Med.)
DAHMI KALAN, JAIPUR

Date: 09 Dec 2022

Link of the Report:

[https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tre
e%20 Plantation-%20DehmiKalan.pdf](https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tre%20Plantation-%20DehmiKalan.pdf)





**MANIPAL UNIVERSITY
JAIPUR**
(University under Section 2(f) of the UGC Act)

FACULTY OF DESIGN

SCHOOL OF ARCHITECTURE AND DESIGN

“Tree Plantation Drive” at Govt. School, Sanjharia

ON 09 Dec 2022

Date of Event 09 Dec 2022



Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the participants
5. Photographs
6. Brochure or creative of the event
7. Attendance of the Event

1. Introduction of the Event

As part of Society Connect Initiative, Directorate of Student Welfare, School of Architecture & Design and NSS organized a TREE PLANTATION DRIVE at Govt. School Sanjharia. The Directorate of Student Welfare and students of School of Architecture & Design played an important role in this campaign. The plantation was done under the patronage of Ar. Sidharth Soni, Assistant Professor from School of Architecture and Design. The event was attended by students of MUJ and students from School.

2. Objective of the Event

- To conduct plantation drive in local schools for environmental conservation.
- To involve students of MUJ and students from local school to develop a sense of belongingness.

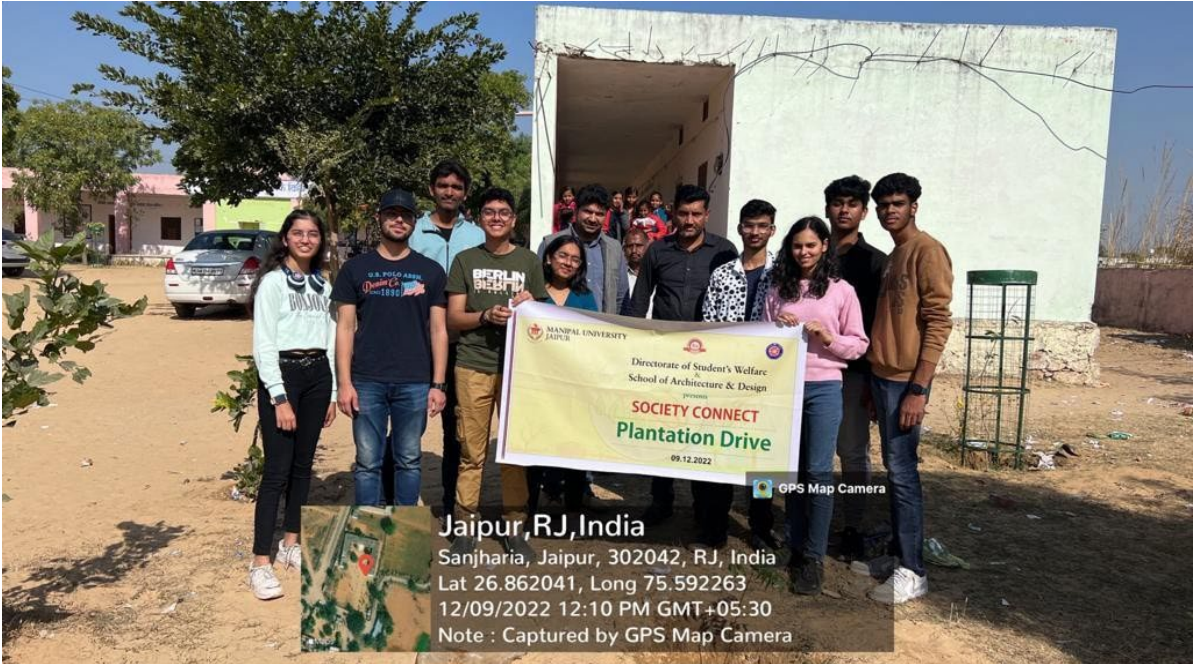
3. Beneficiaries of the Event

Students, and staff members of Govt. School, Sanjharia

4. Details of the Participants

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
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18	220501021	IKSHITA BAGLA
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20	220501023	VANSHIKA SHARMA

5. Photographs of the event or screenshots of the event with captions



Students of MUJ planting tree saplings with faculty members from MUJ at Govt. School Sanjharia on 9th Dec 2022.

6. Brochure or creative of the event





7. Attendance of the Event

1	Asst. Prof.	SIDHARTH SONI
2	220501001	ANANYA TANDON
3	220501002	SAJAL PANWAR
4	220501003	RIJUL CHAUDHARY
5	220501004	DAKSH RUPANI
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Govt. High Secondary School, Sanjharia

Letter of Appreciation

On 9th December 2023, Manipal University Jaipur organized a TREE PLANTATION DRIVE in association with NSS (National Service Scheme), DSW (Directorate of Student Welfare, MUJ) and SA&D (School of Architecture & Design) in the campus of Govt. School Sanjharia, Jaipur.

Tree plantation drive was conducted by Ar. Sidharth Soni, MUJ alongwith Students's of first yr. Architecture and Students from the Govt. School, Sanjharia.

We highly appreciate efforts of Manipal University Jaipur for conducting TREE PLANTATION DRIVE in the campus of Govt. School Sanjharia, Jaipur.


प्रधानाचार्य
रा.उ. मा. वि. सौंझरिया
संभाकर, जयपुर

Govt. School, Sanjharia

Date 09 Dec 2022

Link of the Report:

[https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tree%20 Plantation-%20Sanjharia.pdf](https://jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Tree%20Plantation-%20Sanjharia.pdf)





**MANIPAL UNIVERSITY
JAIPUR**

FACULTY OF Design

NAME OF SCHOOL OF ARCHITECTURE AND DESIGN

“Tree Plantation Drive” at Govt. School Thikaria

ON 23 Nov 2021

Date of Event 23 Nov 2021



Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the participants
5. Photographs
6. Brochure or creative of the event
7. Attendance of the Event

1. Introduction of the Event

As per general environmental concern in precinct of MUJ, a day long tree plantation drive was organized by School of Architecture & Design at Govt. School Thikaria. During this, 6 saplings were planted in the school campus. The Directorate of Student Welfare and students of School of Architecture & Design played an important role in this campaign. The plantation was done under the patronage of Ar. Sidharth Soni, and Ar. Jyoti Yadav, Assistant Professors from School of Architecture and Design. The event was attended by students.

2. Objective of the Event

- To conduct plantation drive in local schools for environmental conservation.
- To involve students of MUJ and students from local school to develop a sense of belongingness.

3. Beneficiaries of the Event

Students, and staff members of Govt. School, Dehmikalan

4. Details of the Participants

1. Ar. Sidharth Soni, Asst. Prof. MUJ
2. Ar. Jyoti Yadav, Asst. Prof. MUJ
3. Ms. Chhavi Kohli, MUJ
4. Mr. Dhruv Jain, MUJ
5. Mr. Vishal Kumawat, MUJ
6. Ms. Aditi Didwania, MUJ
7. Ms. Surbhi Sharma, MUJ
8. Various students from Govt. School Dehmikalan.
- 9.

5. photographs of the event or screenshots of the event with captions



Students of Govt. School, Thikaria and MUJ planting tree saplings with faculty members from MUJ.



6. Brochure or creative of the event



7. Attendance of the Event

1. Ar. Sidharth Soni, Asst. Prof. MUJ
2. Ar. Jyoti Yadav, Asst. Prof. MUJ
3. Ms. Chhavi Kohli, MUJ
4. Mr. Dhruv Jain, MUJ
5. Mr. Vishal Kumawat, MUJ
6. Ms. Aditi Didwania, MUJ
7. Ms. Surbhi Sharma, MUJ
8. Various students from Govt. School Dehmikalan.



Directorate of Student's Welfare

NCC Activity Report

S.No.	Date	Title of the Event	Brief of the Event	No. of Cadets Participate
1	27 August 2021	Tree Plantation	Directorate of Student welfare NCC Air wing Troop No. 6 Manipal University Jaipur organized the event of Tree Plantation on 27 August, 2021 to highlight the National Cadet Corps Air Wing Troop of Manipal University Jaipur has planted over 30 saplings across the MUJ Campus during the tree plantation drive which organize 27 August 2021. The event was inaugurated by Registrar, MUJ Dr Nitu Bhatnagar, Prof. A.D. Vyas Director Student's Welfare MUJ, and around 37 NCC Cadets & faculty members and staff participated in the plantation drive. The aim of the plantation drive is to increase the Green cover of our country, fight the menace of global warming and to create better environment for the next generation.	37



Name of Event: Tree Plantation

Date of the Event: August 27, 2021

Duration of Event: One Hour 03:00PM- 04.00PM

Name of Coordinator: Mr. Sanjeev Sharma

Organizing School / Department: Directorate of Student welfare

Photos of the Event & details of the Activity :- Directorate of Student welfare NCC Air wing Troop No. 6 Manipal University Jaipur organized the event of Tree Plantation on 27 August, 2021 to highlight the National Cadet Corps Air Wing Troop of Manipal University Jaipur has planted over 30 saplings across the MUJ Campus during the tree plantation drive which organize 27 August 2021. The event was inaugurated by Registrar, MUJ Dr Nitu Bhatnagar, Prof. A.D. Vyas Director Student's Welfare MUJ, and around 37 NCC Cadets & faculty members and staff participated in the plantation drive. The aim of the plantation drive is to increase the Green cover of our country, fight the menace of global warming and to create better environment for the next generation.



MANIPAL UNIVERSITY
JAIPUR



Brochure of Tree Plantation

 MANIPAL UNIVERSITY
JAIPUR

 NAAC A+ GRADE WITH 3.28 SCORE



Going Green Tree Plantation

by
Dr Nitu Bhatnagar
Registrar
Manipal University Jaipur

27th August 2021
Time: 02:30 PM
Venue: VIP Gate, MUJ Campus

**NCC Air wing Cadets &
Directorate Student Welfare**



Glimpse of the Event





Attendance

S.NO.	NAME	REGIMENTAL NUMBER
01	DR. NITU BHATNAGAR	
02	PROF. A.D. VYAS	
03	ANKIT SINGH RATHORE	RJ/18/SDF/278420
04	ANANYA CHITRE	RJ/18/SDF/278427
05	KAVITA CHOUDHARY	RJ/19/SWF/278442
06	JYOTI YADY	RJ/19/SWF/278453
07	ABHISHEK SHARMA	278429



08	RAVEENA SHEKHAWAT	RJ/19/SWF/278456
09	ROHIT BERWAL	RJ/19/SDF/278449
10	LALIT SINGH	191106004
11	NITENDRA PRATAP SINGH	RJ/19/SDF/278447
12	MUDITA CHOUDHARY	RJ/19/SWF/278454
13	SHAURYA SINGH	RJ/19/SDF/278455
14	VINAYAM SARAN	RJ/19/SDF/278443
15	PRASHANT SHARMA	RJ/19/SDF/278444
16	SHREYAS VATS	RJ/19/SDF/278446
17	ISHVAK TANEJA	RJ/19/SDF/278445
18	ADITYA PATIL	RJ/19/SDF/278449
19	PALWINDER SINGH	RJ/19/SDF/278451
20	DIGVIJAY SINGH	RJ/19/SDF/278455
21	ROHIT SINGH	RJ20/SDF/278472
22	JAGJIT SINGH	RJ/20/SDF/278465
23	PRADEEP DEEPAK CHATE	209302362
24	DISHA GOYAL	RJ20/SWF/278460
25	ISHAN SINGH	RJ20/SDF/278464
26	ABHYUDAY RATHORE	RJ/20/SDF/278473
27	AARESH RAJAWAT	RJ/20/SDF/278461
28	HONEY PADIYAR	RJ20/SDF278463
29	PAWAN SINGH	RJ/20/SDF/278467
30	PRASHANT KUMAR	RJ20/SDF/278469
31	DEEPENDRA RATHORE	RJ20/SDF/278462



32	PRATYUSH VOHRA	RJ20/SDF278470
33	PREET GOYAL	1 RAJ
34	ADITI SINGH	RJ/20/SWF/278458
35	CHETNA KESI	278459
36	HEMANTH KUMAR	
37	SANJEEV SHARMA	

Campus - Dehmi Kalan, Jaipur - Ajmer Expressway, Jaipur

 jaipur.manipal.edu

Sanjeev Sharma
Sports & NCC Officer
Manipal University Jaipur



**MANIPAL UNIVERSITY
JAIPUR**

FACULTY OF Design

NAME OF SCHOOL OF ARCHITECTURE AND DESIGN

**“Vriksharopan Abhiyan” at Manipal University Jaipur
ON 75th Independence Day**

Date of Event (10/08/2021-17/08/2021)



Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the Guests
5. Brief Description of the event
6. Photographs
7. Brochure or creative of the event
8. Schedule of the Event
9. Attendance of the Event
10. News Publication- not published in news
11. Feedback of the Event-
12. Link of MUJ website



1. Introduction of the Event

On the occasion of 75th Independence Day, an eight-day mass plantation drive was organized at Manipal University under the Green Rajasthan Initiative, Jaipur. During this, more than 170 saplings were planted in the university campus. The Directorate of Student Welfare and School of Architecture and Design played an important role in this campaign run under the Green Rajasthan programme. The plantation was done under the patronage of Chief Administrative Officer Colonel Vipul Mathur. Tree plantation has been done by all the departments of the university. On the sixth day of the campaign, on the auspicious occasion of 15th August, 100 medicinal plants were planted. On this occasion the President of the University Prof. G K Prabhu and Smt. Malini Prabhu also planted saplings. Prof. N N Sharma, Pro VC and Dr. Nitu Bhatnagar, Registrar MUJ has also contributed in the plantation in this campaign. During the program Prof. Anil Dutt Vyas, Director, (DSW), Mr. Hemant Kumar, Assistant Director (DSW), Ravindra Kumar and Dr. Madura Yadav, Prof. Sunanda Kapoor etc. were present. The program was coordinated by Dr. Amit Sharma and Jyoti Yadav of the Department of Architecture.

2. Objective of the Event

- To conduct 8 days mass plantation drive on 75 Independent Day.
- To undertake plantation drive under the Green Rajasthan Initiative
- To involve faculties and staff member in the plantation drive

3. Beneficiaries of the Event

More than 50 faculty and children participated in the plantation drive

4. Details of the Guests

- a. Dr. Gopalkrishna Prabhu, President, MUJ
- b. Mrs. Malini Prabhu

5. Brief Description of the event

Total 170 nos. of plants of different species were planted at different locations in the campus. On 15th August occasion of Independence Day 10 herbal plants were planted, Dr. G K Prabhu (Vice-Chancellor MUJ) and Mrs. Malini Prabhu also participated in the event. Prior to this on day one 10 neem trees were planted, second day 10 palash, third day 10 gulmohar, fourth and fifth day 10-10 fruit trees were planted. On seventh and eighth day 10-10 shaded trees were planted like neen, khejdi, pilkhan, yellow bell etc, were planted. In the plantation drive senior professor and faculties from various department actively participated. On third day of the event Dr. Madhura Yadav, Prof. Sunanda Kapoor and all the faculties of the SA&D have actively participated in the plantation activities. On the closing day 17th August 2021 Prof. Anil Dutt Vyas (Director DSW), Col. Vipul Mathur (CAO MUJ), Dr. Madhura Yadav (Director SA&D), Prof. Sunanda Kapoor (Head SA&D), Mr. Hemant Kumar (Asst. Director DSW) have participated in the plantation.

6. 3 to 5 photographs of the event or screenshots of the event (if online) with captions



Tulsi Plant Planted by Dr. G.K. Prabhu and Mrs. Malini Prabhu



Children Participated in Plantation Drive



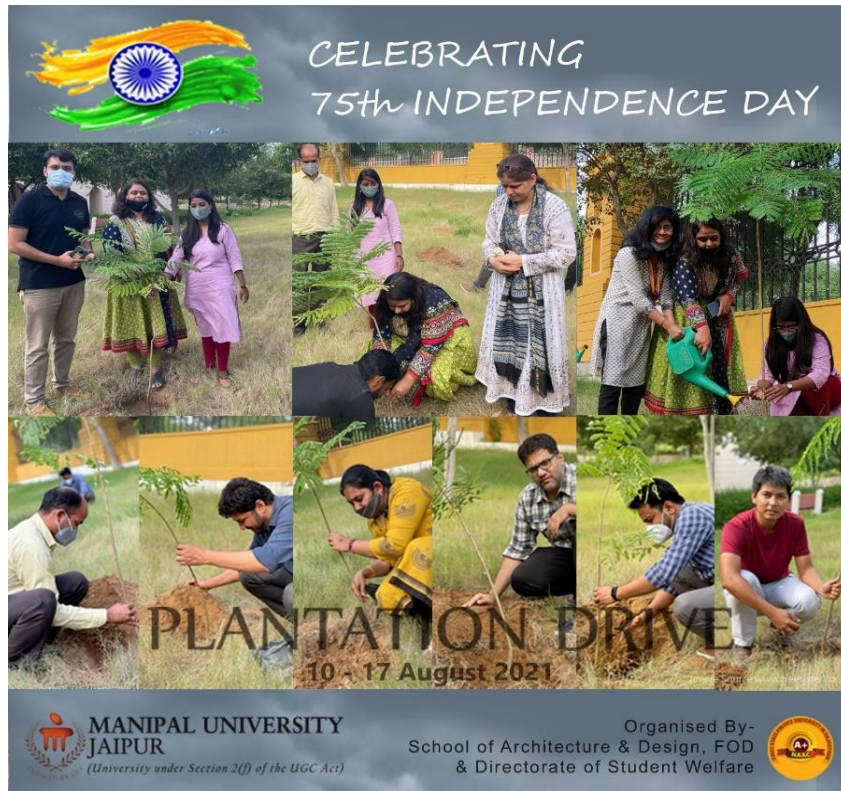
Neem tree Plantation on closing Day



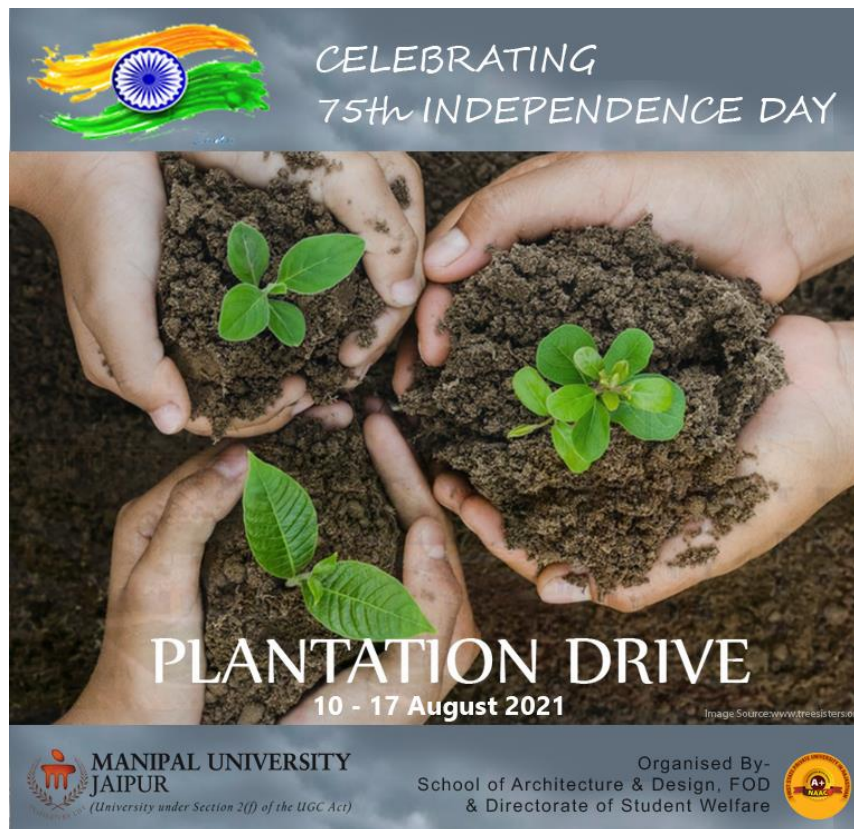
Tacoma tree Plantation on closing Day



Tree Plantation by SA&D Faculty Members



7. Brochure or creative of the event



8. Schedule of the event

Date	Day	Location	Nos. and Plants Species	Coordinator
10-Aug 21	Tuesday	Near Cricket Field	10 Nos. Neem Trees	Ar. Jyoti Yadav
11-Aug 21	Wednesday	Behind HT Mound	10 Nos Palash Tree	Dr. Amit Sharma
12-Aug 21	Thursday	Backside to VIP Plantation Area	10 Nos. Gulmohar Tree	Ar. Jyoti Yadav & Dr. Shilpi Gupta
13-Aug 21	Friday	Near Cricket Field	10 Nos Fruit Trees	Dr. Shilpi Gupta & Ar. Bineet Chhajer
14-Aug 21	Saturday	Near Cricket Field	10 Nos Fruit Trees	Dr. Anju Yadav
15-Aug 21	Sunday	Near Admin Block Parking	100 Nos. Herbal Plant 10 Nos each species (Tulsi, Ashwagandha, Naagdoon, Pattarchatta, Mint, Drumstick, Bhoomi Awla, Aloevera, Lemon Grass)	Ar. Jyoti Yadav & Dr. Amit Sharma
16-Aug 21	Monday	Near Cricket Field	10 Neem Tree	Mr. Hemant Kumar
17-Aug 21	Tuesday	North-East Side along boundary	4 Neem, 2 Pilkhan, 2 Khejdi & 2 Yellow Bell	Mr. Ravindra Kumar & Ar. Jyoti Yadav

9. Attendance of the Event

1. Col. Vipul Vikram Mathur, Chief Administrative Officer, Head
2. Dr. Madhura Yadav, Director, School of Architecture and Design
3. Prof. Anil Dutt Vyas, Director, Directorate of Student's Welfare
4. Dr. Abhishek Shrivastava, Deputy Director DSW
5. Dr. Babita Malik, Deputy Director, DSW
6. Mr. Hemant Kumar, Assistant Director, DSW
7. Dr. Sham Sunder Sharma, Assistant Director, DSW
8. Dr. Arun Poonia, Assistant Director, DSW
9. Ar. Jyoti Yadav, Assistant professor
10. Dr. Anju Yadav, Assistant professor
11. Dr. Pankaj Vyas (HOD, IT)
12. Dr. Anju Yadav, Assistant professor, Dept of IT
13. Mr. Ankit Mundra, Assistant professor, Dept of IT
14. Mr. Ravinder Kumar, Nucleus member, DSW and Assistant professor, Dept of IT
15. Dr. Shilpa Gupta, Associate Professor, Humanities and Sciences
16. Dr. Amit Sharma, Nucleus member, DSW
17. Mr. Ashok Kumar Kumawat, Nuclear member, DSW
18. Mr. Nikhil vivek Shrivastava, Nucleus Member, DSW
19. Mr. Rahul Khatri, Nucleus member, DSW
20. Ar. Bineet Chhajer, Assistant professor

10. News Publication- News printed in newspaper or online links if any for news – insert images)

https://thebelltv.com/home/news_description/309/plantation-in-manipaluniversity-jaipur

मणिपाल यूनिवर्सिटी जयपुर में आठ दिवसीय सामूहिक पौधारोपण अभियान चलाया गया।



जयपुर। 75वे स्वतंत्रता दिवस के उपलक्ष्य में मणिपाल यूनिवर्सिटी जयपुर में आठ दिवसीय सामूहिक पौधारोपण अभियान चलाया गया। इस दौरान यूनिवर्सिटी परिसर में 170 से अधिक पौधे रोपे गए। हरित राजस्थान कार्यक्रम के तहत चलाए गए इस अभियान में लायरेक्ट्रेट आफ स्टूडेंट वेलफेयर और स्कूल आफ आर्किटेक्चर एंड डिजाइन की महत्वपूर्ण भूमिका रही।

पौधारोपण मुख्य प्रशासनिक अधिकारी कर्नल विपुल माधुर के संरक्षण में किया गया। इसमें विश्वविद्यालय के सभी विभागों की ओर से पौधारोपण किया गया है।



अभियान के छठे दिन 15 अगस्त के पावन अवसर पर 100 औषधीय पौधे रोपे गए। इस अवसर पर यूनिवर्सिटी के प्रेसिडेंट प्रो. जीके प्रभु और श्रीमती मालिनी प्रभु से भी पौधे लगाए। इस दौरान प्रेसिडेंट ने कहा कि मणिपाल यूनिवर्सिटी जयपुर पर्यावरण संरक्षण, हरित और स्वास्थ्यवर्धक वातावरण के लिए प्रतिबद्ध है।

इससे पूर्व अभियान के प्रथम दिन नीम के 10 पौधे लगाए गए। दूसरे दिन पलाश के 10 पौधे लगाए गए। तीसरे दिन गुलमोहर के 10 पौधे लगाए गए। अभियान के चौथे और पांचवें दिन 10-10 फलदार पौधे रोपे गए। 7वें और 8वें दिन 20 छायादार पौधे जैसे नीम, खेजड़ी पीलखन और वेल आदि को रोपा गया।



कार्यक्रम के दौरान लायरेक्ट्रेट, डीएसठब्ल्यू प्रो. अनिल दत्त व्यास, असिस्टेंट लायरेक्ट्रेट (डीएसठब्ल्यू) हेमंत कुमार, रविंद्र कुमार और स्कूल आफ आर्किटेक्चर एंड डिजाइन से डॉ. मदुरा यादव, प्रो. सुनंदा कपूर आदि मौजूद रहे। कार्यक्रम का समन्वयन पत्रकारिता विभाग के डॉ. अमित शर्मा और आर्किटेक्चर विभाग के ज्योति यादव ने किया।





11. Feedback of the Event

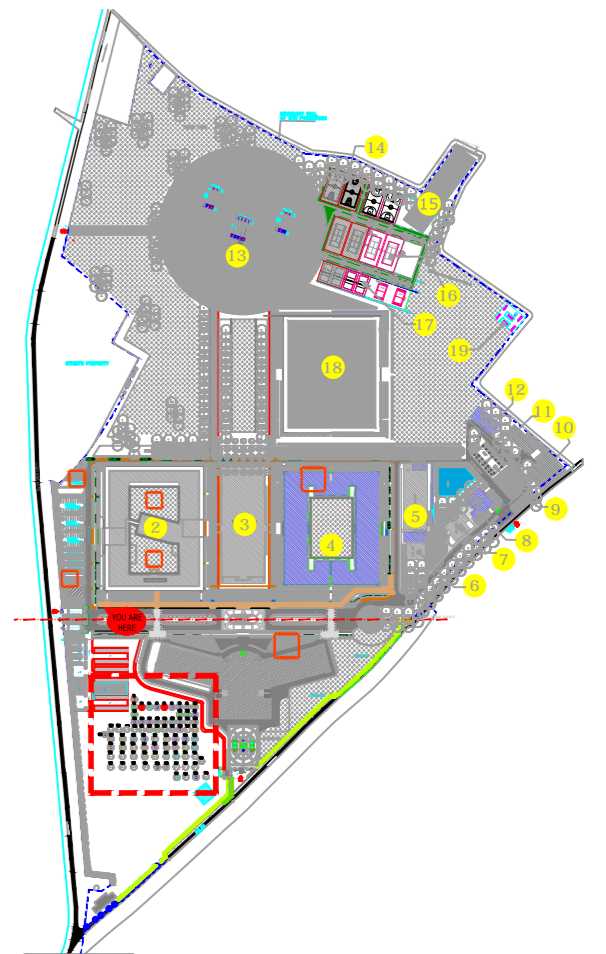
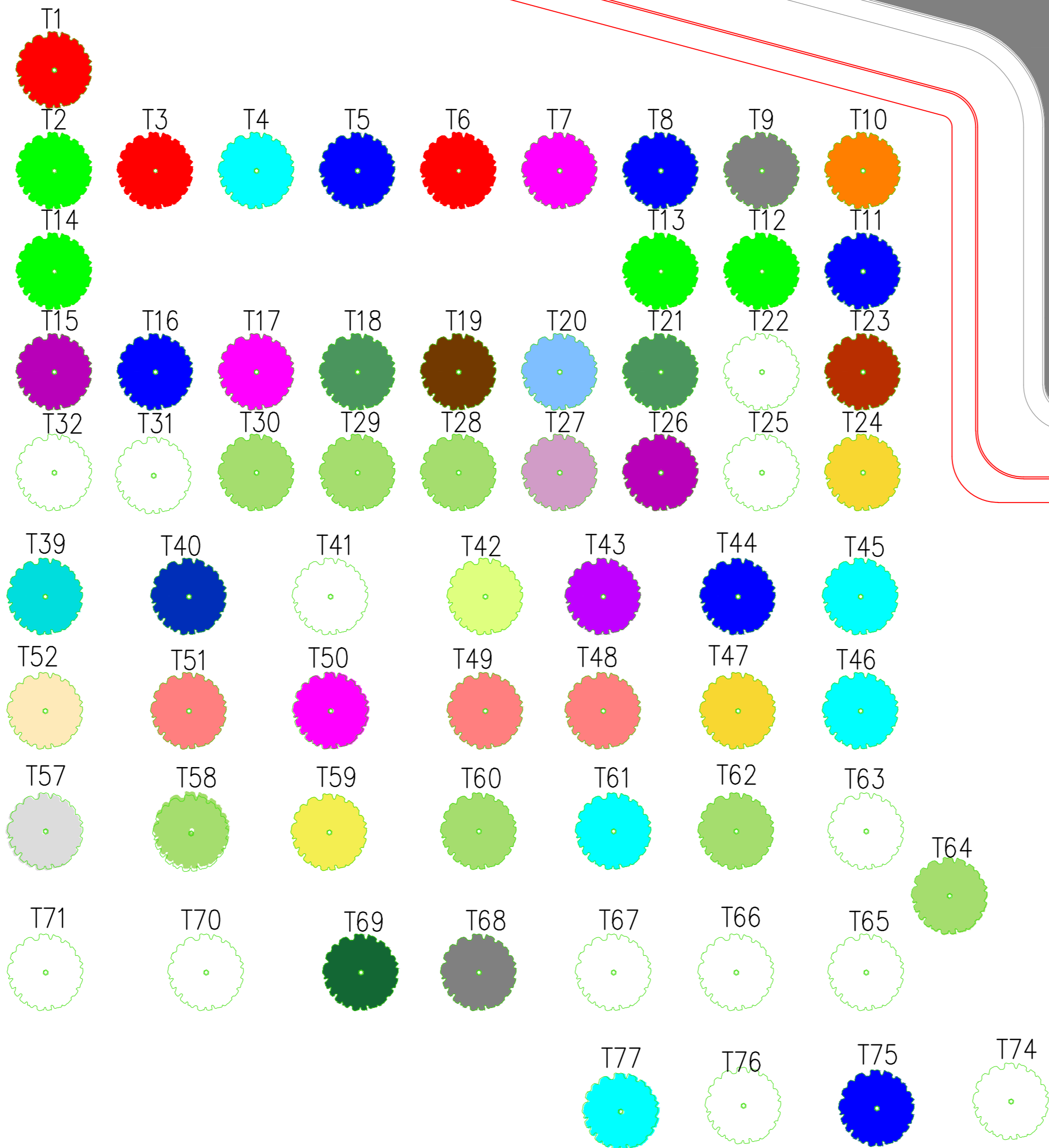
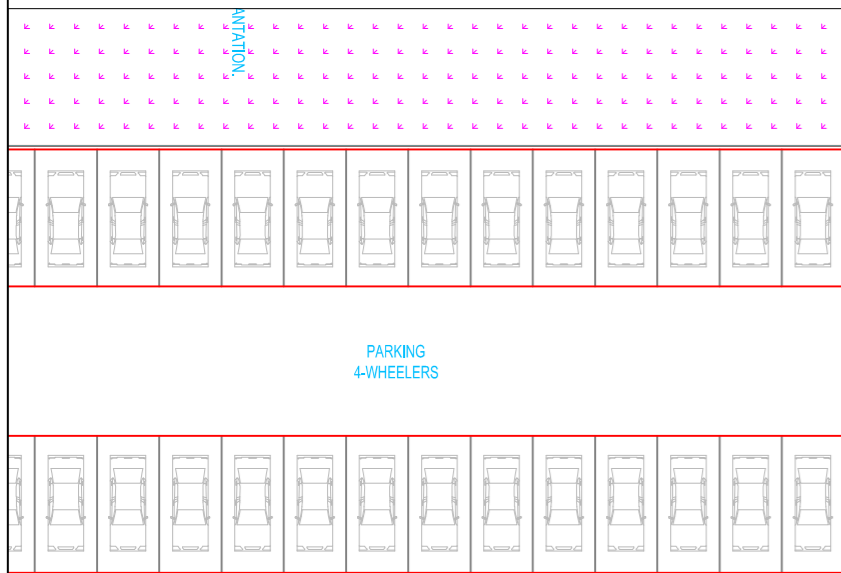
All the faculties actively participated and enjoyed being part of the event.

12. Link of MUJ website stating the event is uploaded on website

jaipur.manipal.edu/content/dam/manipal/muj/fod/Document/eventlist/Mass%20Plantation%20Drive%20on%2010-17%20Aug%202021.pdf

Faculty Coordinator

Ar. Jyoti Yadav



KEY PLAN

LEGEND

- KARANJ (T1, T3, T6)
- ARJUN (T2, T12, T13, T14,)
- KACHNAAR (T4, T45, T46, T62)
- GULMOHAR (T5, T8, T11, T16, T44, T75)
- NEEM (T7, T17)
- JAMUN (T9)
- SAAT PATTI (T10)
- MOLSARI (T15, T26)
- CHAMPA (T18, T21)
- BOTTLE BRUSH (T19, T36)
- KRISHNABAD (T20)
- ASHOK(T24, T38)
- FIGUS LYRATA(T27)
- MADAGASCAR ALMOND(T28, T29, T30, T62, T64)
- KALASEERIS(T37)
- SHEESHAM(T39)
- RUGTOORA(T40)
- BARGAD(T42)
- KADAMB(T43)
- AAM(T53)
- SILVER OAK(T55, 56, 58)
- MIMOSPALANGI(T57)
- CEBIA PENTENDRA(T68)
- AZADIRACHTA INDICA(T69)

VIP SECURITY

Tree tag	Common Name	Scientific Name	Planted By	Year
T1	Karanj	Pongamia Pinnata	Dr. G. K. Prabhu	2018
T2	Arjun	Terminalia Arjuna	Shri Eshwara B. Khandre	2017
T3	Karanj	Pongamia Pinnata	Dr. Rajneesh Goel	2017
T4	Kachnaar	Bauhinia Variegata	Dr. Manjit Singh (I.A.S.)	2012
T5	Gulmohar	Delonixredia	Shri Kuldeep Ranka	2012
T6	Karanj	Pongamia Pinnata	Shri Abhay Jain	2012
T7	Neem	Azadirachta Indica	Brig(Dr.) S. S. Pabla (Retd.)	2012
T8	Gulmohar	Delonixredia	Dr. D. Shrikanth Rao	2012
T9	Jamun	Eugenia Jambolana	Brig(Dr.) P. S. Siwach (Retd.)	2012
T10	Saat Patti	Alstonia Scholaris	Dr. Ajay Kumar	2012
T11	Gulmohar	Delonixredia	Shri M. L. Mehta (I.A.S. Retd.)	2012
T12	Arjun	Terminalia Arjuna	Dr. Lalit K. Panwar	2015
T13	Arjun	Terminalia Arjuna	Shri Rajpal Singh Shekhawat	2016
T14	Arjun	Terminalia Arjuna	Hon. Mr. Justice Pinaki Chandra Ghose	2016
T15	Molsari	Mimosaop Ealangi	Prof. U. N. Gaitonde	2014
T16	Gulmohar	Delonixredia	Hon. Mr. Justice J. K. Ranka	2016
T17	Neem	Azadirachta Indica	Dr. Kiran Mazumdar Shan	2014
T18	Champa	Plumeria Alba	Shri R. V. Deshpande	2012
T19	Bottle brush	Callistemon	Shri Rajeeva Swarup (I.A.S.)	2012
T20	Krishnabad	Ficus Benjamina	Dr. Kumud Bansal	2018
T21	Champa	Plumeria Alba	Shri Sudhakar Rao	2012
T22			Dr. Lalit K. Panwar	2015
T23	Peepal	Pleus Religiosa	Dr. Ranjan R. pai	2012
T24	Ashoka	Saraca Asoca	Shri. J.C. Mohanty	2017
T25				
T26	Maulsari	Minusops Elengi	Ms. Krishna Poonia	2017
T27	Fiddle-leaf Fig	Ficus Lyrata	Prof. Pranadhavardhini	2015
T28	Madagascar Almond	Terminalia Neotaliala	Shri. Kali Charan Saraf	2015
T29	Madagascar Almond	Terminalia Neotaliala	Shri. Ramcharan Bohra	2015
T30	Madagascar Almond	Terminalia Neotaliala	Shri. Kailash Verma	2016
T31				
T32				
T33				
T34				
T35				
T36	Bottle brush	Callistemon	D.S. Chauhan	2017
T37	Kala Siris	Albizia Odoratissima	V. K. Jain	2014
T38	Ashoka	Saraca Asoca	Prof. Milind Kollegal	2016
T39	Sheesham	Dalbergia Sissoo	Shri. G.S. Sandhu (IAS)	2014
T40	Rugtoora	Spathodea Campanulata	Shri. N.R Narayan Murthi	2018
T41				
T42	Bargad	Ficus Benghalensis	Dr. Ramdas M. Pai	2012
T43	Kadamb	Neolamarckia Cadamba	Smt. Vasanti Pai	2012
T44	Gulmohar	Febaceae	Shri. Purushottam Agarwal	2014
T45	Kachnar	Bauhinia Variegata	Shri. Sunil Arora	2012

MUJ Tree/ Plant Details

SR.No	Tree/Plant Name	Quantity
NOTE - The following		
1	Gulmohar - Flame Delight	215
2	Champa - Golden Blossom	309
3	Termainlia - Royal Canopy	402
4	Bansh - Tranquil Bamboo	731
5	Tikoma - Forest Glow	323
6	Lagstomia - Whispering Willow	30
7	Meetha Neem - Sweet Neem	159
8	Beel - Serene Banyan	29
9	Karanj - Verdant Karanj	319
10	Molsari - Radiant Molsari	48
11	Ficus - Enchanted Ficus	12

12	Phonics - Melodious Phonic	23
13	Kerima Plant - Graceful Kerima	42
14	Trigal Palm - Majestic Trigal	44
15	Travelers Palm - Wanderlust Palm	8
16	Sisham - Sacred Sisham	2316
17	Neem - Healing Neem	1977
18	Bargad - Mighty Bargad	15
19	Mango - Tropical Mango	147
20	Jaamun - Deep Purple Jaamun	119
21	Guvava - Lush Guvava	105
22	Chiku - Sweet Chiku	60
23	Mousami - Citrus Mousami	18
24	Khajoor - Desert Gem Khajoor	114
25	Anar - Pomegranate Beauty	16
26	Karuja - Vibrant Karuja	11
27	Shadded Tree	512
		8104
Faculty Housing Tree /Plant Details		
1	Termainlia - Regal Canopy	199

2	Shisham - Sacred Shisham	47
3	Neem - Healing Neem	30
4	Koria - Serene Koria	22
5	Gulmohar - Flame Delight	11
6	Champa - Golden Blossom	11
7	Meetha Neem - Sweet Neem	9
8	Guvava - Lush Guvava	5
9	Beel - Majestic Banyan	4
10	Chiku - Sweet Chiku	5
11	Mousami - Citrus Mousami	5
12	Nimbu - Zesty Nimbu	3
13	Kathal - Tropical Kathal	4
		355
Total Plant/Tree		

ails

g plants thrive with minimal water usage."









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8459

MUJ/DSW/Student Clubs/2022/CypherClubMUJ/June3



DIRECTORATE OF STUDENTS' WELFARE

Hanging of Prindas

Society Connect

Cypher Club of MUJ

OFFLINE EVENT

Date of Event: 03/06/2022

Index

S.No.	Activity Heads	Page no.
1.	Introduction of the Event	3
2.	Objectives of the Event	3
3.	Beneficiaries of the Event	3
4.	Brief Description of the Event	3
5.	Brief Description of the NGO	3
6.	Photographs of the Event	3-4
7.	Schedule of the Event	4
8.	Attendance of the event	4-5
9.	Feedback of the event	5
10.	Link of MUJ Website	6

1. Introduction of the Event: Taking an initiative for the welfare of birds the cypher club has decided to hang parindas at Omaxe city, Ajmer Road, Jaipur.

2. Objectives of the Event: Due to increasing heat in Jaipur we have realized that it has become a problem for birds to survive and it's difficult for them to adapt this habitat so we are conducting this drive for providing water to quench the thirst.

3. Beneficiaries of the Event:

- Muj CA student and members

4. Brief Description of the Event:

The drive is done by Cypher Club in association with NGO named as sunshine health and welfare society and we have planted parindas for the birds that are suffering because of the heat waves as many of them are dying because of it and as the concerned member of cypher club under the supervision of our faculty Ma'am Kuntal gaur. We've gotten the opportunity to plant them inside Omaxe city, jaipur, Ajmer Road.

5. : Brief Description of the NGO:

This is non-government organization of Jaipur stab list in 2010. Works for social welfare conduct various events related to environment it works primarily in domain of development and health

6. Phototgraphs:





6. Schedule of the Event:3th June 2022

7. Attendance of the Event:

Total Attendee- 14

S.NO.	Name Of Institution	Place Of Institution	Name	Name of Dept.
1.	Manipal University Jaipur	Jaipur	Lov bhaliya	MCA
2.	Manipal University Jaipur	Jaipur	Muskan Chandnani	MCA
3.	Manipal University Jaipur	Jaipur	Milisha Jain	MCA
4.	Manipal University Jaipur	Jaipur	Ashwariya	MCA

5.	Manipal University Jaipur	Jaipur	Shubham	MCA
6.	Manipal University Jaipur	Jaipur	Rajani	Mca
7.	Manipal University Jaipur	Jaipur	Neha	Mca
8.	Manipal University Jaipur	Jaipur	Shabanti	MCA
9.	Manipal University Jaipur	Jaipur	Akash	MCA
10.	Manipal University Jaipur	Jaipur	Yashvardhan	MCA
11.	Manipal University Jaipur	Jaipur	Sachin	MCA
12.	Manipal University Jaipur	Jaipur	Shashang	MCA
13.	Manipal University Jaipur	Jaipur	Gautam	BCA
14.	Manipal University Jaipur	Jaipur	Muskan	BCA

8. Feedback of the Event: Student felt immense pleasure by hanging the parindas and helping the birds

9.Link of MUJ website:

<https://jaipur.manipal.edu/muj/life-at-muj/Student-CLUBS.html>



Mrs. Kuntal Gaur
Dept.of Computer Application
Faculty Coordinator

<p>DIRECTOR STUDENT WELFARE & PROCTOR MANIPAL UNIVERSITY, JAIPUR</p>	 <p><u>Dr. Arun Kumar Poonia</u> Asst. Director, DSW Clubs</p>
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T6 Karanja *Millettia pinnata*

Indian sub continent & Southeast Asia

Planted by - Shree Abhay Jain

Year of Plantation - 21st March 2012

Family- Fabaceae



Nature - Evergreen

Climate - Humid & Sub
Tropical Region

Leaf Texture - Soft &
Shiny

Leaf Shape & Colour -
Round & Glossy
Deep Green

Foliage Shape - Round
Soil Type -Sandy stony &
clayey

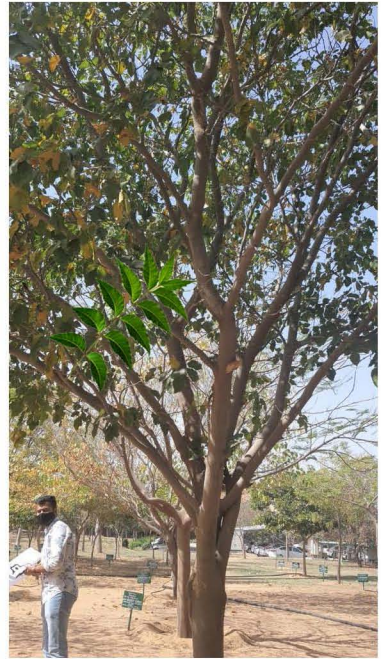
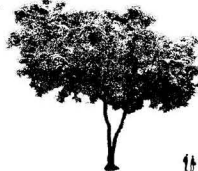
Tree Height - 15 to 25 mts. 1 Unit - 4 mts

Bark Diameter - 50 cmts.

Region - Temperate Asia,
Australia



Leaf type-
Pinnate



Uses

- It is used for landscaping purpuss due to large canopy & snowy fragrant flowers.
- The bark can be used to treat wounds caused by poisonous fish.
- The fruits & sprouts are used in many traditional remedies.
- Its oil known as Pongamia oil is used in soap making & as a lubricant.
- The residue of oil extraction is used as a fertilizer.

T8 Peela Gulmohar *Peltophorum pterocarpum*

Tropical south-eastern asia

Planted by - Dr. D. Srikanth Rao

Year of Plantation - 21st march, 2012

Family- Legumes



Nature - Deciduous

Climate - Tropical warm climate.

Leaf Texture - Fern like leaves

Leaf Shape & Colour - Rusty red tomentose.

Foliage Shape - Round

Soil Type - moist, but well drained soil.

Tree Height - Approx. 10 mts.

Bark Diameter - 20-25 mts.

Region - Sri Lanka, the Andamans & Australia.



Leaf type- Tripinnate



1 Unit - 4 mts



Uses

- Gulmohar is well known for its beautiful flowerst.
- It also has some medicinal properties like Anti-diabetic activity, Anti-bacterial activity, Anti-diarrheal property, Hepatoprotective/Cytotoxic property, Anti-microbial activity, Anti-Inflammatory activity

T9 Jamun *Eugenia jambolama*

Indian sub continent

Planted by - Brig(Dr.) P.S.Siwach(Retd.)

Year of Plantation - 21st March 2012

Family- Myrtaceae



Nature - Evergreen

Climate - Tropical & Sub

Tropical Region

Leaf Texture - Smooth,

Leathery

Leaf Shape & Colour - Glossy

Dark Green, Long with

Pointy tips

Foliage Shape - Round

Soil Type - Deep Loamy

Tree Height - 30 mts.

Bark Diameter - 40-100 cmts

Region - India, Myanmar

& Srilanka



Leaf type-
Pinnate



1 Unit - 5 mts



Uses

- Jambolan fruits can be eaten raw or are made into jams.
- Fruits have great nutritional value.
- Jambolan is used in medicine for diabetes, swelling of the stomach, constipation, diarrhea & other conditions.
- Jamun fruit is used in treating common cold, cough & flu.
- Jamun fruit helps in regulating blood pressure.
- The tree bark can be used for decoration.

T10 Saat Patti *Alstonia scholaris*

Southern China, Tropical Asia and Australasia

Planted by - Dr. Ajay Kumar

Year of Plantation - 21st March 2012

Family- Apocynaceae



Nature - Evergreen

Climate - Tropical

Leaf Texture - Glossy & Greyish.

Leaf Shape & Colour -
Flattened roots similar to buttresses.

Foliage Shape - Slightly round.

Soil Type - Red Alluvial.

Tree Height - 20-40 mts.

Bark Diameter -
100-200cmts.

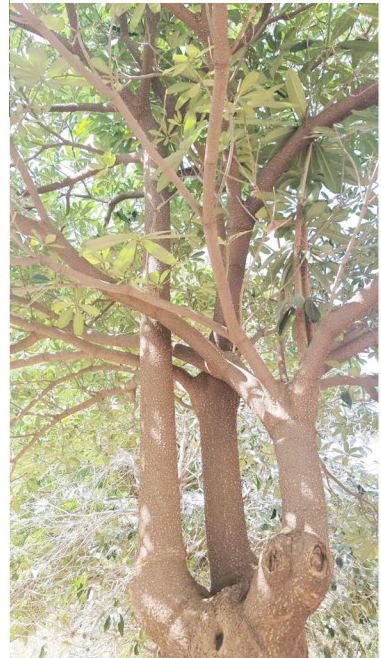
Region - Malaysia Pakistan



Leaf type-
Pinnate



1 Unit - 7 mts



Uses

- *Alstonia scholaris* has been used in different system of traditional medication for the treatment of diseases.
- The wood of *Alstonia scholaris* has been recommended for the manufacture of pencils.
- Wood close to the root is very light and of white color, and is used for net floats, household utensils, trenchers, corks, etc.
- Used for landscape purpose.

T15 Maulsari *Minusops elengi*

South Asia

Planted by - Ms Krishna Poonia

Year of Plantation - 18-01-2017

Family- Sapotaceae (Mahua family)



Nature -Evergreen

Climate - Summer season

Shape & Colour - Bark: Thick bark and appears dark brown in color

Foliage of tree - Glossy, dark green leaves

Soil Type -Rich free draining loamy and sandy soil with PH of 5.5-8.5

Height of tree- 9-18 m (30-59 ft)

Diameter of trunk -1m (3ft 3in)

Region - Tropical forest in South Asia, Southeast Asia and northern Australia



Zoomed image



Flower type



Leaf type



Uses

- Treatment and maintenance of oral hygiene
- Rinsing mouth with water solution made with bakul helps in strengthening the teeth
- Prevents bad breath
- Keeps gums healthy

T17 Neem *Azadirachta indica*

Indian sub continent

Planted by - Dr. Kiran Mazumdar Shan

Year of Plantation - 9th August 2014

Family- Mahogany family, Meliaceae



Nature - Evergreen

Climate - Tropical & Semi-Tropical Region

Leaf Texture - Mildly soft

Leaf Shape & Colour - Long medium to dark green

Foliage Shape - Round

Soil Type - All types

Tree Height - 15 to 20 mts.

Bark Diameter - 30-80 cmts.

Region - Burma, Iran, India and Pakistan



Leaf type- Bipinnate



1 Unit - 4 mts



Uses

- The neem tree is noted for its draught resistance. It can grow in many different type of soil.
- Dried neem leaves prevents insects from eating clothes and can also be used in storing rice.
- The flowers and the shoot are eaten as a vegetable.
- Products made from neem tree can be used as medicine.
- Neem is a key ingredient in pesticides.

T19 Bottle Brush *Callistemon*

Australia

Planted by - D.S.Chauhan

Year of Plantation - 18-01-2017

Family- Myrtle



Flower type

Nature - Evergreen

Climate - Temperate regions

Texture of flower- Fury

Shape & Colour - Flower: Red flower spikes

Foliage of tree - Crown is rounded

Soil Type - Well-draiend, sany soil.

Also grow in clay or loam

Height of tree- 10-15 ft

Diameter of tree-10 to 15m

Region - Western North America and in colder regions in greenhouses



Zoomed image



Flower type



Leaf type



Uses

- Ornamental landscaping
- Common remedies for treatment of diarrhoea, dysentery and rheumatism

T24 Ashoka *Saraca asoca*

Indo-Malaysian and Srilanka

Planted by - Shri J.C.Mohanty

Year of Plantation - 18-01-2017

Family- Legumes



Nature -Evergreen

Climate -Rain-forest tree. Central areas of Deccan plateau

Texture of Bark: Warty surface

Shape & Colour - Leaf: Green colored leaves with oblong shape.

Foliage of tree: Shiny foliage

Height of the tree -10'-15' tall

Diameter of trunk: 3m

Region - Central areas of the Deccan plateau



Uses

- Reduces acne, pimple
- Very useful in gynaecological conditions
- Boosts memory power
- Beneficial in diabetes

T27 Fiddle-leaf fig *Ficus lyrata*

Africa

Planted by -Prof. Pranadhavardhini

Year of Plantation - 22-05-2015

Family- Moraceae



Nature - Flowering plant

Climate - Lowland tropical rainforest

Texture of bark - Leathery

Shape & Colour of leaf - Unique,

Green

Foliage of tree - Medium

Soil Type - Fast-draining,
well-aerated

Height of the tree - 40-50 ft

Diameter of trunk - 30-60 ft

Region - Tropical western and
central Africa



Zoomed Image



Flower Type



Leaf Type



Uses

- In urban plantings of parks, highways median and streets without sidewalk as it withstands the overwhelming atmosphere of the cities.
- It is also used as an air purifier.
- It is mostly used in office spaces.

T37 Kala siris *Albizia Odoratissima*

East Asia

Planted by - V.K.Jain

Year of Plantation - 10-06-2014

Family- Leguminosae - Mimosoideae



Climate - Warm climate

Texture -Bark dark grey to light brown with horizontal lenticels.

Foliage of tree-Crown spreading, relatively dense with drooping foliage.



Zoomed image

Soil Type -Grows best in fertile soils

Height of tree- 22-40 m

Diameter of trunk - 120-150 cm

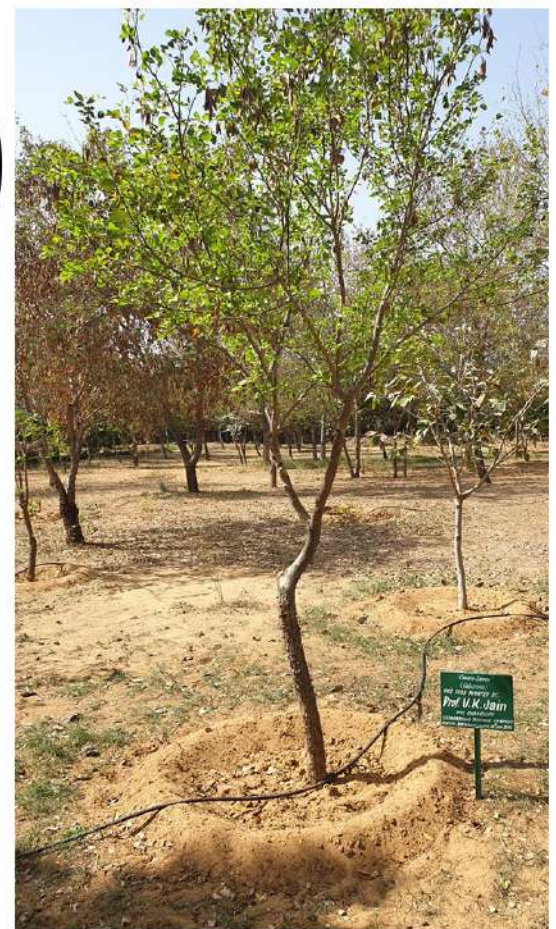
Region - India, Bangladesh, Bhutan, Nepal, Myanmar, Laos, Thailand, Vietnam, Sri Lanka



Flower type



Leaf type



Uses

- The bark of the tree is useful in ulcers, leprosy, skin diseases, cough, bronchitis, diabetes and burning sensation.
- The bark is used in the manufacture of a fermented sugar cane wine.

T39 Sheesham *Dalbergia sissoo*

Indian subcontinent

Planted by - Shri G.S. Sandhu (IAS)

Year of Plantation - 2014

Family- Leguminosae - Mimosoideae



Nature - Deciduous Tree

Climate - Indian subcontinent and southern Iran

Texture of trunk: are often crooked when grown in the open. Leaves are leathery

Foliage of tree- Round foliage

Soil Type - Soils range from pure sand and gravel to rich alluvium of river banks.

Height of tree- 25 m (82 ft)

Diameter of trunk- 2-3 m

Region - Native to India, Pakistan and Nepal



Zoomed image



Flower type



Leaf type



Uses

- Decoration of leaves is useful in gonorrhoea.
- Wood is alterative, useful in leprosy, boils, eruptions and to allay vomiting.
- The wood is used for making doors, window frames, furniture, especially cabinets and much more.
- The pulp of wood is also used for making papers.

T40 *Rugtoora Spathodea campanulata*

Tropical Africa

Planted by -Shri N.R Narayan Murthi

Year of Plantation - 2018

Family- Bignoniaceae



Nature -Deciduous

Climate - Cooler tropical climate

Shape & Colour - **Bark** : when young is pale grey-brown and smooth which turns to grey-black.



Zoomed image

Foliage of tree- Compact, round crown of dense and dark green foliage

Height of the tree - 7-25 m



Flower type

Region - West coast from Guinea to Angola, and inland across the tropical rainforest region to southern Sudan and Uganda



Leaf type



Uses

- Cure rashes and inflamed skin,
- Lower blood sugar levels,
- Treat ulcers,
- Treat diabetes,
- Cure glaucoma

T42 Bargad *Ficus benghalensis*

Indian subcontinent

Planted by - Dr. Ramdas M. Pai

Year of Plantation - 21-03-2012

Family- Moraceae



Nature - Evergreen

Climate - Monsoon and rain forests

Texture of leaf- leathery

Shape & Colour - Heart and green

Foliage of tree - Round Foliage

Soil Type - High moisture

Height of tree - up to 30m (100 ft)

Diameter of trunk - spreads laterally indefinitely

Region - south eastern region of India



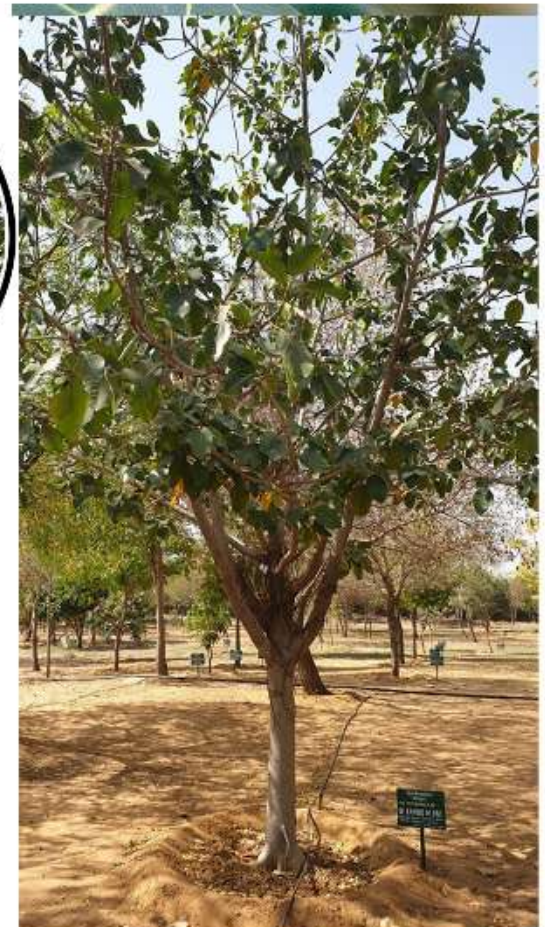
Zoomed image



Leaf type



Fruit type



Uses

- Boosts immunity
- Prevents depression
- Treats vomiting
- Lowers Cholestrol
- Prevents inflammation

T43 Kadamb *Neolamarckia cadamba*

Southeast Asia

Planted by - Smt. Vasanti Pai

Year of Plantation - 2012

Family- Madder family



fruit type

Nature - Evergreen

Climate -Tropical

Shape & Colour - Flowers: flowers are sweetly fragrant, red to orange in colour, occurring in dense



Zoomed image

Foliage of tree- broad crown and straight cylindrical bole

Soil Type -It grows well in deep moist alluvial soils, often along river banks.



Flower type

Height of tree- up to 45 m

Diameter of trunk- 100cm

Region - South and Southeast asia



Leaf type



Uses

- Low-grade timber and paper
- Timber is used for plywood and light construction.

T44 Gulmohar *Fabaceae*

Planted by - Shri Purushottam Agarwal

Year of Plantation - 2014

Family- Leguminosae - Leguminosae



Nature -Deciduous

Climate - Temperate and tropical

Texture of leaf - wrinkled pulvini

Shape & Colour of leaf -Range from pinnately or palmately compound to simple,Green



Flower type

Foliage of tree -Dense

Soil Type -soil that is above freezing temperatures and offers enough warmth



Leaf type

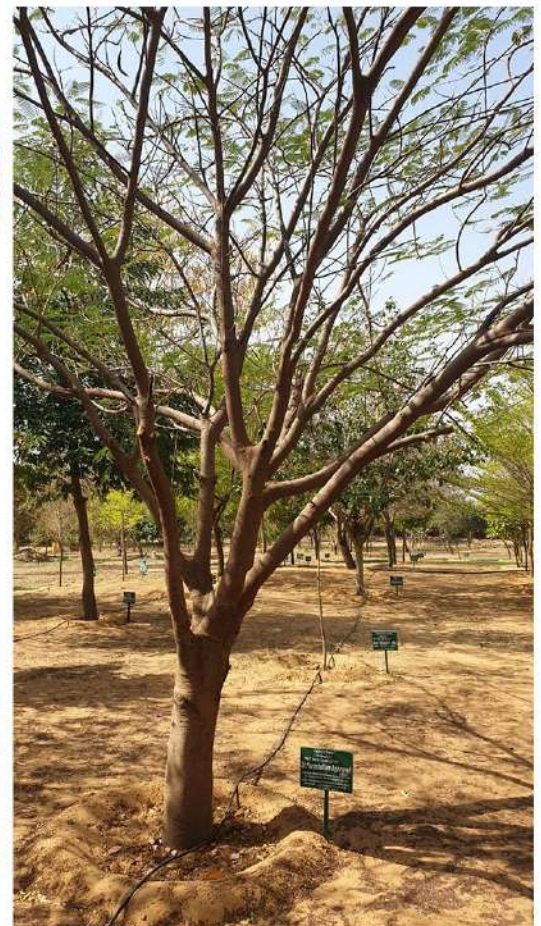
Height of tree - 10-15m

Diameter of trunk - 2 inches

Region - predominant outside the tropics



Zoomed Image



Uses

- Anti-diabetic activity

-To treat polymenorrhea, anemia, ulcers and menorrhagia (during pregnancy).

-In the treatment of diarrhoea, in overcoming the protein deficiency Kwashiorkor and can also impact hypocholesterolaemic conditions, and thyroxine-induced hyperglycaemia.

T45 Kachnar *Bauhinia variegata*

Eastern Africa

Planted by - Shri Sunil Arora

Year of Plantation - 16-04-2012

Family- Leguminosae - Legumes



Nature - Deciduous

Climate- The desert/desert terrain plain of Western or Eastern Ghats.

Plateaus, plains of Ganges, Doab Punjab, eastern ranges, north east zone, high altitudes.

Shape & Colour of tree - Twigs of tree are slender, light green, angled, hairy and brownish grey in colour.

Foliage of tree -Spreading crown and a short bole.

Soil Type - Acid and Neutral

Height of tree - Small to medium upto 15 M



Zoomed image



Leaf type



Flower type



Uses

- Treat hypothyroidism
- Controls blood sugar
- Treatment of digestive system problems



Water Treatment Plant and Sewerage Treatment Plant





Water Reuse from WTP and STP

	Year 2021-22			
	WTP		STP	
	Domestic water in KL		Flush water in KL	
	200 KLD (MUJ)	80 KLD (Housing)	150KLD	350KLD
Month				
April	5570	1405	180	3464
May	4400	1273	444	3922
June	4366	1226	241	4118
July	3395	1145	152	4736
August	2278	1002	0	4502
September	2746	1216	167	4655
October	2765	1258	139	4040
November	2623	1216	52	4198
December	2974	1212	45	3905
January	3824	1132	15	3765
February	3267	1116	0	3661
March	3073	1184	0	3757
Total	34941	12085	1435	41305
Per month Avg.	3494.1	1208.5	143.5	4130.5



Manipal University Jaipur Measures Water Reuse Across Campus

Manipal University Jaipur is embracing the practice of reusing water to promote sustainability and contribute to a more water-conscious future. Water reuse, also known as water recycling or reclaimed water, involves treating and repurposing wastewater for non-potable purposes such as irrigation, cooling, and toilet flushing. Implementing water reuse measures on campus has several advantages. It reduces the demand for potable water, easing the burden on local water supplies. Water reuse aligns with sustainability goals and contributes to reduced water-related environmental impacts. Water reuse initiatives provide educational opportunities for students, fostering a culture of environmental responsibility.

Measuring Water Reuse Across Campus

Assessing Current Usage: Manipal University Jaipur began by assessing its current water usage patterns, identifying areas where water reuse can be implemented effectively. This involves understanding the sources of wastewater, such as greywater from sinks and showers and rainwater runoff from rooftops. Establishing water reuse systems requires the implementation of appropriate infrastructure and technologies. Manipal University Jaipur invested in treatment facilities, distribution networks, and storage solutions that ensure the treated water is safe and suitable for non-potable applications. Monitoring is a critical aspect of measuring water reuse. Universities employ sensors, meters, and data analytics to track water usage and the performance of its reuse systems. This data helps identify trends, optimize operations, and ensure compliance with water quality standards. Manipal University Jaipur prioritizes transparency sharing water reuse data with the campus community and stakeholders. Regular reports on water savings, system performance, and maintenance activities promote awareness and accountability. The university uses advanced monitoring systems to measure the efficiency of its water reuse systems, ensuring that they meet water quality standards and perform optimally. Regular reports on water savings and system maintenance are shared with the campus community, fostering transparency and accountability. University initiatives to measure water reuse across campus reflect a commitment to sustainability and responsible water management. By assessing current water usage, implementing infrastructure and technology, and tracking performance, Manipal University Jaipur plays a pivotal role in conserving water resources and inspiring future generations to prioritize environmental stewardship.



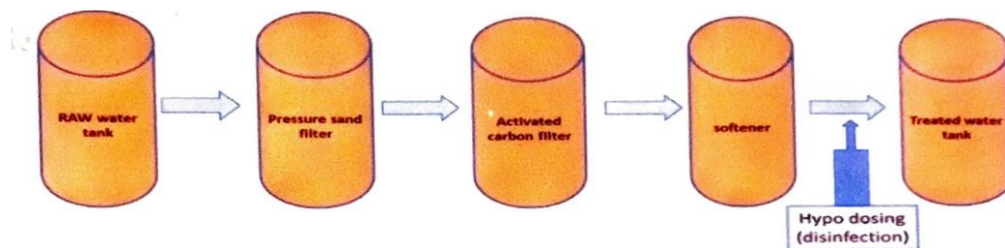
Water Conservation Facilities available in the Institution

The integrated water management plans at Manipal University Jaipur are created and put into practice for the campus with a primary focus on the triple bottom line benefits, i.e., social, economic, and environmental benefits. As a result, MUJ moved closer to becoming water neutral by creating a flexible, robust water infrastructure. Manipal University Jaipur has a strength of 1150 people, according to the design requirements for the MUJ university campus, 220 LKD of groundwater supply is needed. The total amount of water needed is divided into three categories: residential consumption, toilet flushing needs, and irrigation needs for landscaping. The groundwater supply meets the needs of the university. A water meter is an ingenious way of measuring how much water is consumed so that each unit is billed based on its usage. From an economic, engineering, and management standpoint, sub-metering benefits MUJ, which all help promote sustainability.

The University blocks at MUJ use 25,893 kl/year of water, while the MUJ uses the sewage treatment plants (STP) processed water for flushing and gardening needs. The rainwater from the Rainwater Harvesting (RWH) tanks is also used by MUJ for landscaping needs. The STP's dry sludge is further processed into manure that is used for on-site landscaping. 80 percent of residential and flushing wastewater is PROCESSED, and this recycled water is used for watering landscapes. The hostel blocks use 440,500 kl/year. Overall, the campus uses 513,754 kl/year of water.

Wastewater is treated to speed up the natural process of purifying water, Aiding Nature so That Nature can Aid us. Manipal University Jaipur (MUJ) is treating the wastewater not just for our family of students, faculties, and staff members but also for our family of Flora and Fauna, with the Savage Treatment Plant of Capacity 1850 KLD. Wastewater from the buildings is collected through gravity by underground drainages and treated in the STP at desired parameter.

The treatment plant purifies water, it eliminates harmful contaminants in the most economical manner, and provides a healthier environment. MUJ has a qualified team who always endeavors to improve our Sewage Treatment Plant, benefits along with water production make wastewater treatment a sustainable short and long-term solution to the world water crisis, MUJ thinks with a Global vision.



Recycling wastewaters bolster local water supplies, improves water quality, saves energy, and reduces discharge and disposal costs of wastewater. Manipal University Jaipur provides alternatives to the current water supply, reusing water which enhances water security, sustainability, and resilience. The Manipal University in Jaipur has a zero-discharge policy for wastewater. Therefore, all on-site wastewater is treated to tertiary standards and reused on-site for a variety of uses, including flushing, cooling tower makeup, horticulture, etc.



Water Reuse from WTP and STP

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Manipal University Jaipur as Catalysts for Good Water Management Education

Water is a precious resource essential for all life on Earth, and ensuring its responsible management is a pressing global concern. Manipal University Jaipur is stepping forward as champions of good water management, providing vital educational opportunities to local communities. Water is a finite resource, and its availability and quality are crucial for the well-being of communities and ecosystems. Challenges such as water scarcity, pollution, and climate change underscore the need for efficient and responsible water management. Manipal University Jaipur recognizes that education is a potent tool in addressing these challenges and has thus embarked on efforts to inform and engage local communities.

Manipal University Jaipur organizes workshops and training sessions to educate local community members about various aspects of water management. These may cover topics like water conservation, purification, and wastewater treatment. Public lectures and seminars, often featuring experts in the field, are accessible forums where communities can learn about the importance of water management and its impact on local and global scales. Manipal University Jaipur frequently engages in collaborative research projects with local communities to address specific water management challenges. This hands-on approach not only solves real-world problems but also educates participants about sustainable solutions. With the digital age, Manipal University Jaipur has expanded their outreach through online resources. Webinars, e-courses, and educational platforms provide accessible avenues for individuals to learn about water management at their own pace. Students often play a significant role in university-led initiatives. They participate in outreach programs, volunteer efforts, and community-based projects that promote good water management practices (Annexure 1, 2 & 3).

Knowledge empowers individuals and communities to make informed decisions about water usage, conservation, and pollution prevention. Awareness of sustainable water management practices helps communities reduce waste, save money, and protect their local environment. Education equips communities to better respond to water-related crises, such as droughts or flooding, by implementing proactive measures and adaptation strategies. Informed communities are more likely to advocate for effective policies and practices related to water management at local and regional levels. By learning about clean water practices, communities can enhance public health and well-being by reducing waterborne diseases.

The impact of Manipal University Jaipur' educational efforts on water management extends far beyond the classroom. Empowered communities are more likely to adopt water-saving technologies, implement sustainable practices, and actively participate in water-related decision-making processes. This results in reduced water wastage, improved water quality, and enhanced resilience against water-related challenges, contributing to a more sustainable future.



**MANIPAL UNIVERSITY
JAIPUR**



**MANIPAL UNIVERSITY
JAIPUR**

FACULTY OF SCIENCE

SCHOOL OF BASIC SCIENCES

DEPARTMENT OF PHYSICS

NAME OF EVENT: Innovative Project Ideas by Young Minds

Date of Event (24/02/2022)



Content of Report

1. Introduction of the Event
2. Objective of the Event
3. Beneficiaries of the Event
4. Details of the Guests
5. Brief Description of the event
6. Photographs
7. Brochure or creative of the event
8. Schedule of the Event
9. Attendance of the Event



1. Introduction of the Event

Innovative Project Ideas by Young Minds: National Science Day 2022

2. Objective of the Event

The National Science Day themed upon 'Integrated Approach in S & T for Sustainable Future' to commemorate the Nobel Prize winning discovery 'Raman Effect' by Sir C V Raman, was celebrated online at Manipal University Jaipur (MUJ) on February 28, 2022. As an integral part of the event, the project ideas were invited on the theme of the national science day by school students. The main objective of the event was to inculcate the idea of creative thinking in younger students in the areas of science and technology.

3. Beneficiaries of the Event

School Students

4. Details of the Guests

Prof. Ashutosh Sharma

Former Secretary, Govt. of India, Department of Science and Technology, Institute Chair
Professor IIT Kanpur

5. Brief Description of the event

The National Science Day themed upon 'Integrated Approach in S & T for Sustainable Future' to commemorate the Nobel Prize winning discovery 'Raman Effect' by Sir C V Raman, was celebrated online at Manipal University Jaipur (MUJ) on February 28, 2022. The program began with Saraswati Vandana. Prof. Lalita Ledwani, Dean, Faculty of Science, welcomed all the guests and attendees. Registrar, Dr. Nitu Bhatnagar threw light upon the excellence being created by the Manipal University Jaipur. Pro-President, Prof. N. N. Sharma shared his views on importance of science. Prof G. K. Prabhu, President said that apart from celebration, we must put all efforts to attract younger minds to the field of science. Government is putting lots of interest in basic sciences and Manipal University Jaipur is also putting tremendous efforts to the same cause. The chief guest of the function Prof. Ashutosh Sharma Former Secretary, Govt. of India, Department of Science and Technology, Institute Chair Professor IITK Coordinator, DST Unit on Nanoscience & Center for Environmental Science and Engineering began his talk by giving some of the notable achievements of Indian scientists like C V Rama, J. C. Bose and Meghnad Saha etc. All of them concisely focused on generation of new knowledge and its dissemination to the society. Talking about the theme of the national science day, Prof. Sharma emphasized upon use of lateral thinking, creativity and common sense in solving problems. He gave the examples of discovery of graphene and atomic force microscopy.



He also elaborated various areas of science and technology where India is lagging. He concluded his talk with saying 'Future is convergence' and science and technology is essentially required for the future growth.

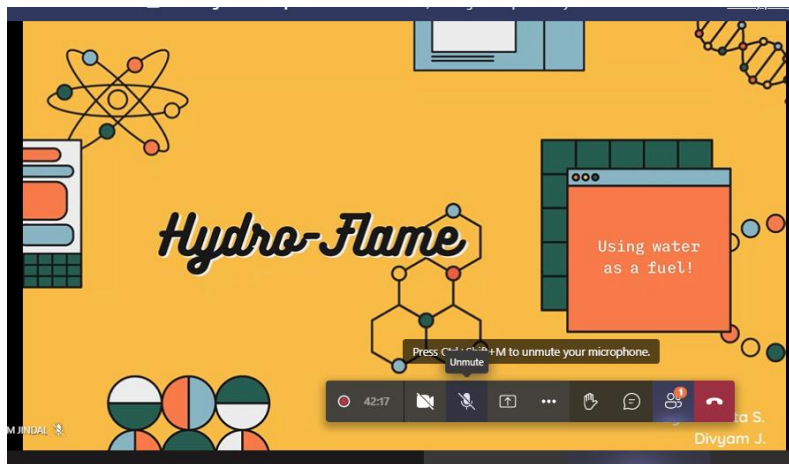
To celebrate this great event in more jovial way, various competitions like e-poster, online science quizzes and innovative project ideas by young minds etc. were also conducted for students of different schools and winners were felicitated during the event. Dr. Ashim Bagaria, the convener of the program told the more than 350 participants registered for various activities from across the country. Vote of thanks was presented by Dr. Devershi Pallavi Bhatt, second convener of National Science Day program.



Photographs of the event or screenshots of the event (if online) with captions



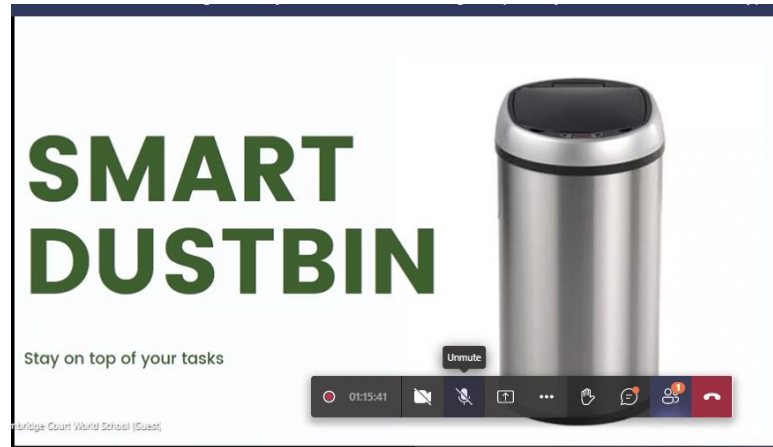
National Science Day celebration



Project Idea Presentation by the students



Project Idea Presentation by the students



Project Idea Presentation by the students

6. Brochure or creative of the event



A brochure for National Science Day 2022. The top section features logos for Manipal University Jaipur, MUJ, and a blue triangle logo. The text reads: 'School of Basic Sciences Faculty of Science Invites you for NATIONAL SCIENCE DAY 2022 Theme: Integrated Approach in S&T for Sustainable Future Virtual celebration on FEBRUARY 28, 2022 9:30 AM - 11:30 AM'. Below this is a portrait of Prof. Ashutosh Sharma, identified as the Chief Guest. His credentials are: Institute Chair Professor IITK, Coordinator DST Unit on Nanoscience & Center for Environmental Science and Engineering. The bottom section lists activities during NSD 2022: February 24, 2022 (Innovative Project Ideas by Young Minds, E-Poster Competition) and February 25, 2022 (Online Quiz Competition). It also states 'Registration Open' and 'Last Date of Entry Submission: February 23, 2022'. A registration link is provided: <https://docs.google.com/forms/d/1r1FAIpQLSdQ41w-6P-aK806s4471PhqK0DPzRSLYzd4EApeM1gtrEgo3Q/viewform>. The bottom right features an image of a building and the text 'SPONSORED BY BUREAU OF INDIAN STANDARDS ATTRACTIVE PRIZES'. A URL for more details is provided: <https://jaipur.manipal.edu/muj/news-events/events-list.html>



7. Schedule of the event

Innovative Project Ideas by Young Minds February 24, 2022	
Time	Speaker/event
2:30 pm to 2:35 pm	Introduction to the event
2:35 pm to 5:30 pm	Presentation of project ideas

8. Attendance of the Event

Total attendee-78.

S. No.	Name	School/college	Class
1.	Shradul Kaushik	Bal Bharati Public School	IX
2.	Aarth Singal	Bal Bharati Public School Pitampura	VIII (8)
3.	Prerit Roshan	Bal Bharati public school pitampura	IX
4.	Saksham Garg	Bal Bharati Public School Pitampura	IX (9)



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5.	Soham Gupta	Bal Bharati Public School Pitampura	IX
6.	Vanshika Kataria	Veda Vyasa DAV Public School	IX
7.	NIHARIKA BISHT	Veda Vyasa D.A.V. Public School, Vikaspuri, New Delhi	X
8.	Abdul Baasith	Clarence High school	XI
9.	Anandita Singh	Veda Vyasa D.A.V Public School	7ty
10.	Parnika Agarwal	Bombay Scottish School	X
11.	Unnati Mehta	Veda Vyasa DAV Public School	VII
12.	UDIT BHATT	DEHLI PUBLIC SCHOOL GANDHINAGAR	3
13.	Umme Salma M	St. Paul's English School	IX, X, XI & XII
14.	Arjav Jain	Bal Bharati Public School Pitampura	X
15.	Sanvi Chopra	Bal Bharati Public School Pitampura Delhi	IX
16.	Shriman Singh	Balbharati public school pitampura rohini	VII
17.	Harnoor Singh Bindra	VV DAV Public School	X-F (10th - F)
18.	Armaan wadhera	Bal bharati public school pitampura	X
19.	Roshni Ramaratnam	Bombay Scottish School, Powai	IX
20.	Sonia saini	School	7th
21.	Siddhi Gupta	V.V D.A.V. Public School	VII
22.	Suthir R	CS Academy	VI
23.	Anushree Trivedi	Delhi public school jagdalpur	8
24.	Anshika Trivedi	Delhi public school jagdalpur	3
25.	Uday Mudgal	MAPSAV	V
26.	ABHAY MUDGAL	MAHARAJA AGARSAIN PUBLIC SCHOOL	V
27.	Sanvi Chopra	Bal Bharati Public School Pitampura Delhi	IX
28.	Kanishak	VVDAV PUBLIC SCHOOL VIKASPURI DELHI	VII



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29.	Kanishka	VVDAV PUBLIC SCHOOL VIKASPURI DELHI	VII
30.	BRINNA PANCY B	CLARENCE HIGH SCHOOL	8C
31.	Thanesha Mehra	Bal Bharati Public School	XI -C
32.	Aaditya jindal	Bal bharti public school pitampura	X
33.	Samarth Kambiri	Bal bharti public school	VI
34.	H	H	X
35.	Sparsh Kumar	Sunbeam School Sultanpur	IX
36.	Diya Shastri	Delhi Public school, Gandhinagar	III
37.	Adwait Oaj	Delhi Public School Patna	VIII
38.	Khushi Agnihotri	VED VYAS DAV PUBLIC SCHOOL	VII
39.	Malhar Nareshbhai Barad	Delhi public school gandhinagar	3H
40.	Atraiu Sinha	Bombay Scottish School , Powai .	X
41.	Chahat	Ved Vyas DAV public school	VII
42.	Suryanshi Garg	Veda Vyasa D.A.V. Public School,Vikaspuri	7th
43.	Earthian Prithviwasi	Veda Vyasa DAV Public School	Xth
44.	Prabir Kishan	Delhi Public School, Patna	VI
45.	AARNA GAJJAR	DPS GANDHINAGAR	IV
46.	Vraj Thakur	DPS Gandhinagar	2
47.	Swetha S	DAV GIRLS SENIOR SECONDARY SCHOOL	VIII
48.	Dhikkshita S	DAV Girls Senior Secondary School, Gopalapuram	VIII
49.	Rab kumar	Maharaja agarsain public school	V
50.	Krishiv Uniyal	Bal Bharati Public School, Rohini	7
51.	V. AISHWARYAA THANGAM	D.A.V GIRLS SENIOR SECONDARY SCHOOL GOPALAPURAPURAM	VIII
52.	Joshini.p.b	DAV girls senior secondary school gopalapuram	VII



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53.	Aarth Singal	Bal Bharati Public School Pitampura	VIII
54.	D.Sri Vaineeki	D.A.V Girls Senior secondary school	7
55.	Dinakar Muthyala	Manipal University Jaipur	UG-2nd
56.	Arnav Jain	Manipal University Jaipur	3rd Year, B.Tech
57.	Saira Chaudhary	Bal Bharati Public School	X
58.	Ayush Prajapati	Manipal University Jaipur	BTech 2nd Year Computer and Communication Engg.
59.	Avantika.A	DAV Girls Senior Secondary School	VII
60.	Shriyanshi Srivastava	Manipal University Jaipur	1st year B.Tech CSE
61.	Sourabh Kumar	Manipal University Jaipur	Btech Ist Year
62.	Nikshit Goyal	Ajit Karam Singh International Public School, Sector 41, Chandigarh	IX
63.	Harnoor Singh Bindra	VV DAV Public School	X
64.	T.ABIRAMI	D.A.V Girls Senior Secondary School	VIII
65.	Divyam Jindal	Mayoor School Noida	X
66.	Akshita Srivastava	Mayoor School Noida	X
67.	K Srimayi	D.A.V. Girls Senior Secondary School	VIII
68.	VEVAN DUA	Maharaja agrasain public school	V
69.	PARTH SAXENA	INDRAPRASTHA INTERNATIONAL SCHOOL ,DWARKA	XI
70.	Pawanpreet Singh	Caledonian International School	XI(11)
71.	Daksh Negi	Cambridge Court World School	XI
72.	Rashi Rajak	Delhi Public school Jagdalpur	12
73.	Shivani Govindhan	D.A.V Girls Senior Secondary School	VIII
74.	Kamali kannan	CS Academy	vi
75.	Adeetya Kakkarr	Bal Bharati Public School, Rohini	IX
76.	Inshirah Rizwan Khan	DAV Girls Senior Secondary School, Gopalapuram	VIII



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77.	Daksh Negi	Cambridge Court World School	XI
78.	Bhawansh Pandita	Caledonian international school	VII

Signature of HOD



Technology Demonstration & Training Centre Brief Report of TDTC Training

1. Title of the training: Women Empowerment: Safety, Health, and Hygiene
2. Convener: Dr. Meena Kumari Sharma
3. Place/Location of the training:

S. No.	Location of Training	No. of Training
1.	Anooppura	2
2.	Jhund	2
3.	Dehmi Kalan	1
4.	Narvaria	1
5	Laxmi Narayanpura	1









Brief Report on Societal Training

1. **Title of the training:** Sanitation, Health and Hygiene
2. **Convener:** Dr. Meena Kumari Sharma
3. **Place/Location of the training:** Narvaria and Laxminarayanpura,

Photographs Traning 1: Narvaria Village







Training-2: Laxminarayanpura Village



Field Visit at Tillonia Village



महिलाओं ने जानी सैनिटेशन से जुड़ी जानकारियां



जयपुर ♦ मनिपाल यूनिवर्सिटी और विज्ञान एवं तकनीकी विभाग की ओर से बगरू स्थित ग्राम नरवरिया के राजकीय उच्च प्राथमिक विद्यालय में पांच दिवसीय प्रशिक्षण कार्यक्रम हुआ। सैनिटेशन, हैल्थ और हाइजीन विषय पर हुई कार्यशाला में महिलाओं को स्वास्थ्य और स्वच्छता

संबंधित जानकारियां दी। वर्कशॉप का संचालन मनिपाल यूनिवर्सिटी के सिविल इंजीनियरिंग विभाग की एसोसिएट प्रोफेसर डॉ. मीना कुमारी शर्मा ने किया। इसके तहत महिलाओं को तिलोनिया स्थित बेयरफुट कॉलेज में स्वरोजगार संबंधित जानकारियां दी गईं।



MANIPAL UNIVERSITY
JAIPUR



REPORT ON TAPI BAORI

Architectural Documentation on Tapi Baori of Jodhpur

School of Architecture & Design

Manipal University Jaipur

September 05, 2022

TABLE OF CONTENTS

Chapter 1: INTRODUCTION 3

Heritage Water System of Jodhpur 3

Water Crisis 4

Stepwell / Baodi 5

Tapi Baodi 6

Chapter 2: Architectural Documentation 11

Photo Documentation **Error! Bookmark not defined.**

Plan of Tapi Baodi 12

Elevation of Tapi Baodi 13

Site Sections of Tapi Baodi 13

Chapter 3: CONDITION ANALYSIS 16

DETERIORATION AND IT'S TYPE 16

..... 27

Chapter 4: CONDITION MAPPING Error! Bookmark not defined.

Condition Plan of Tapi Baodi 28

Condition Elevation of Tapi Baodi 29

Site Sections of Tapi Baodi 29

References 32

CHAPTER 1: INTRODUCTION

The desert city of Jodhpur was founded in 1459 AD since then the water structures of various types have been employed to harvest rainwater to make the region hospitable throughout the year.

Jodhpur, like many cities in India, is a city of lakes. It is one of the well-known, tourist attraction destinations in India. The interconnected water architecture system of the region was designed to conserve the minimal water available through rainfalls, and conserved it as reliable water resources through baoris, kunds and lakes.



Figure 1: The Gulabsagar seen against the cityscape of Jodhpur



Figure 2: Worship at the Ranisar during Gangaur festival

Source: (Thilak)

Heritage Water System of Jodhpur

Jodhpur has hills surrounding Mehrangarh Fort and is a catchment area for monsoon waters that flow down into small and large depressions, which in medieval period converted them into lakes from where water was drawn to over hundreds of step-wells and jhalaras.

The city heritage was not just great in art and architecture but also skillfully managed the water resources of the region. This made it possible to supply water through a gravity-led system. A vast network of lakes and canals were built in the hills around the city, while wells, bawaris, jhalaras and tanks became a common feature in the plains. Rainwater stored in the lakes uphill percolates through aqueducts or underground channels to recharge wells and stepwells.”

The city’s water management system was so calculated that the city was able to quench the thirst of its inhabitants till 1950s through a complex network of lakes, step-wells, wells and jhalaras. (singh)

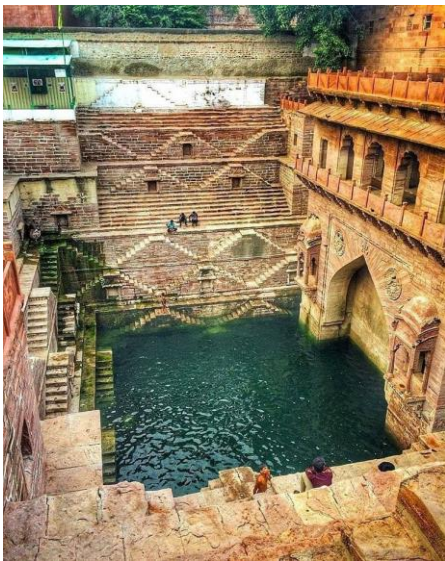


Figure 3: Tunwarji ka Jhalra
Source: (singh)

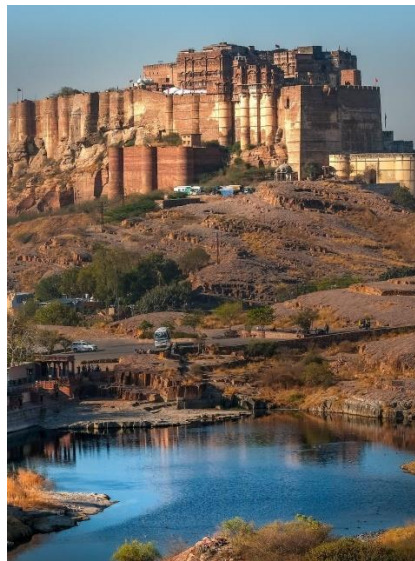


Figure 4: A magnificent stepwell in Jodhpur.
Source: (Fort)

Water Crisis

In the recent past, Jodhpur, like other cities of Rajasthan, has let its water architecture collapse and fall victim to rapid urbanization and public apathy. However, these stepwells also went into disuse, when supply from the Indira Gandhi canal brought perennial water from the rivers in Punjab into this desert city. (N. Sridharan)

Today, many of these architectural marvels that also double up as one of India’s oldest rainwater harvesting systems lie dilapidated.

Historic waterbodies now lie covered in the garbage or have been destroyed by encroachments. Channels that transported water from lakes outside the city to tanks within for public use even as recently as the mid-twentieth century have also been destroyed, leading to the degradation of the reservoirs.



Figure 5: the stepwells of Jodhpur

Source: (Somvanshi)

Stepwell / Baodi

A 1989 survey by the School of Desert Sciences found 48 stepwell / baoris in the city of Jodhpur.

The common English term 'stepwell' encompasses two main types of structures and their hybrids: the baodi, is typically sheltered stepped well where a deep well spilling into a rectangular tank is reached by descending levels of steps from one side, while jhalra are square open structures closer in shape to a stepped pond, with staggered stairs reaching down to the water from three or four sides. Baodi can hold water for a long time because of almost negligible water evaporation. The SDS surveyed 45 baodi - 16 inside the city and 29 outside.

Baodi was once at the center of the social life of the communities that used them. They provided fresh water to locals, it also provided refuge at night to travelers, traders, and pilgrims.



Figure 6: Chand Baori

Source: (Government, n.d.)



Figure 7: Raghunath Baori

Source: (Water Heritage of Jodhpur – Then and Now)



Figure 8: Raghunath Baori

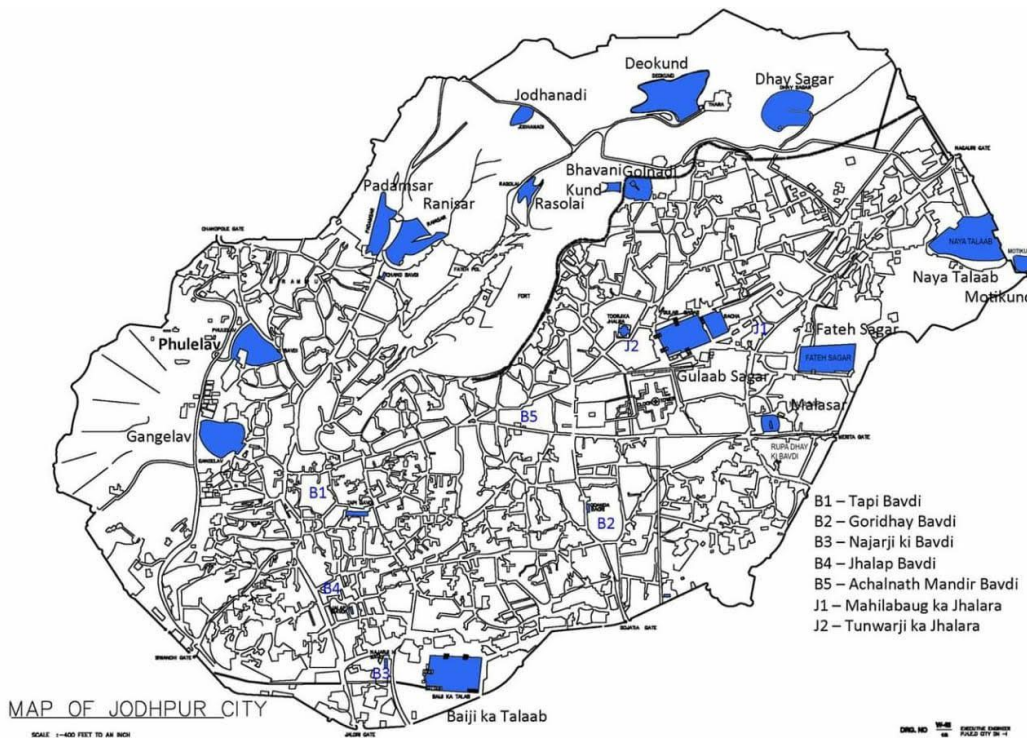


Figure 9: Map of Jodhpur city

Source: (Mallya)

Tapi Baodi

Despite being right in the heart of the old city, the crumbling multi-level rose-red sandstone the Tapi baori is completely hidden from the casual eye and is poignantly lovely.

Tapi Bawdi was built by Natho Ji Vyas, deewan of Maharaja Jaswant Singh I (founder of Jodhpur). Until tap water was introduced, Tapi Baodi provided Jodhpur's residents free clean

drinking water for some 350 years. The baodi measures at 360 feet deep, 40 feet wide, and 250 feet long. (Heritage travel)

Tapi Baodi



Figure 10: Tapi Bawari first Pavilion



Figure 12: Tapi Bawari



Figure 13: Tapi Bawari Pavilion View 1



Figure 14: Tapi Bawari during raining season

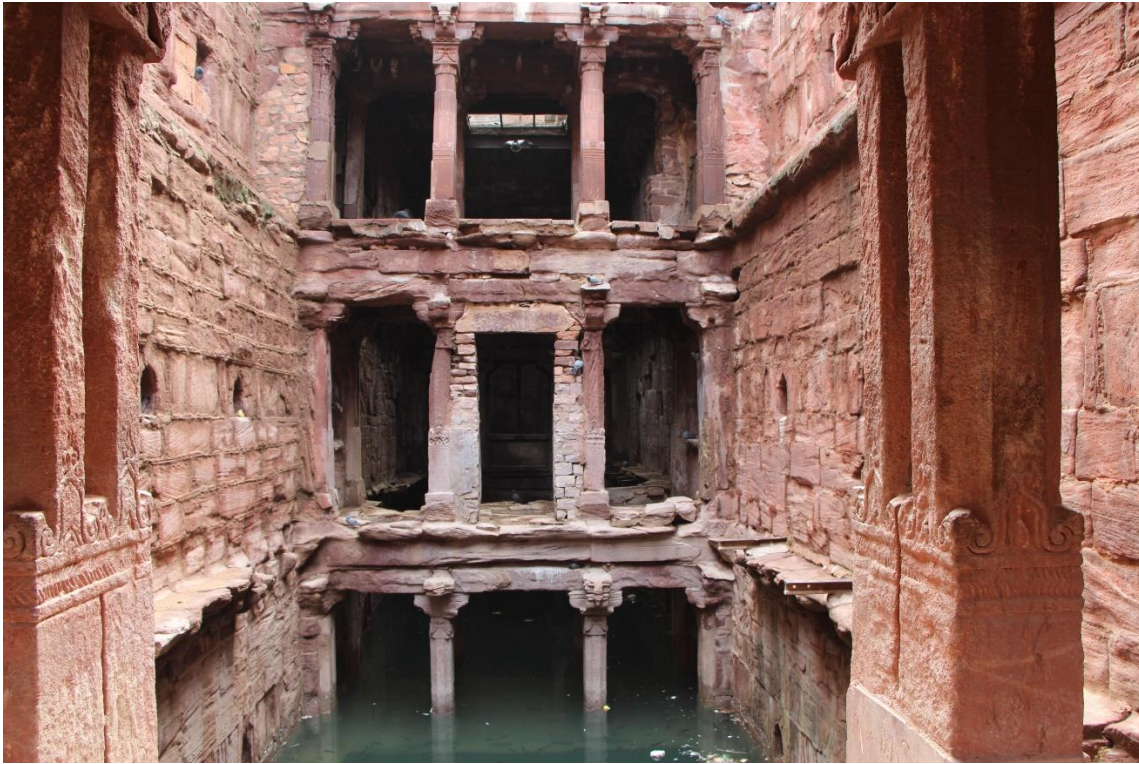


Figure 15: Tapi Bawari Pavilion View 2

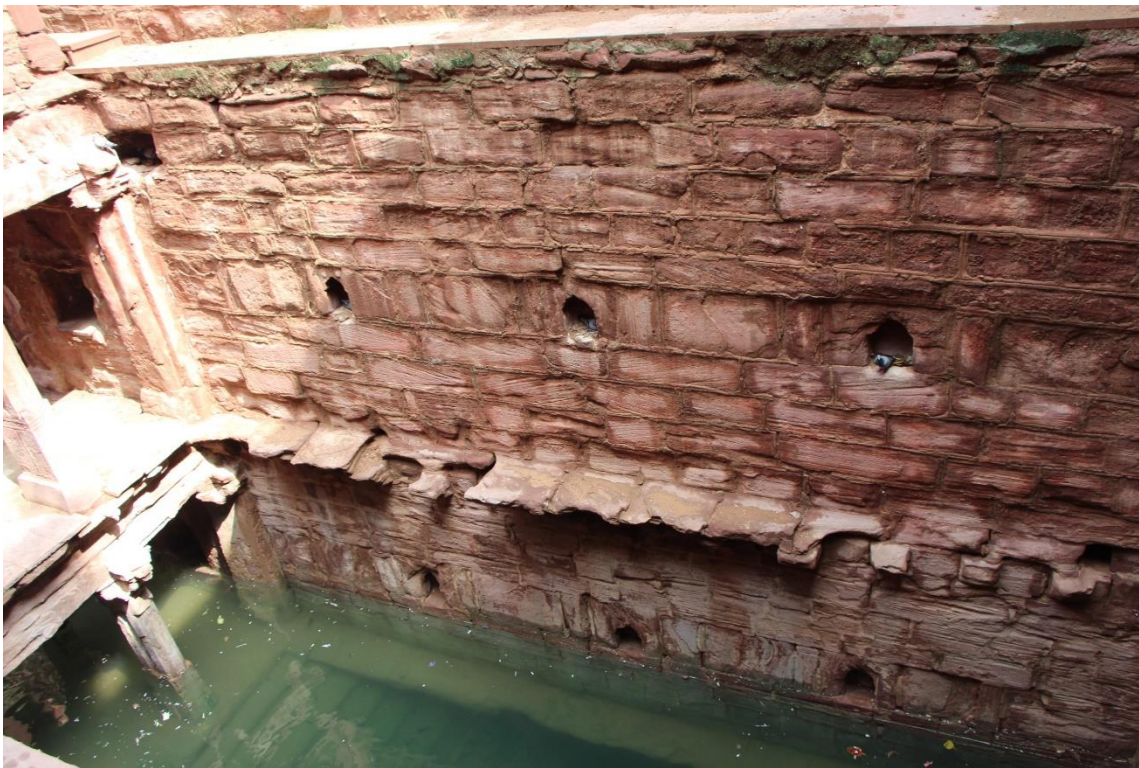


Figure 16: Tapi Bawari

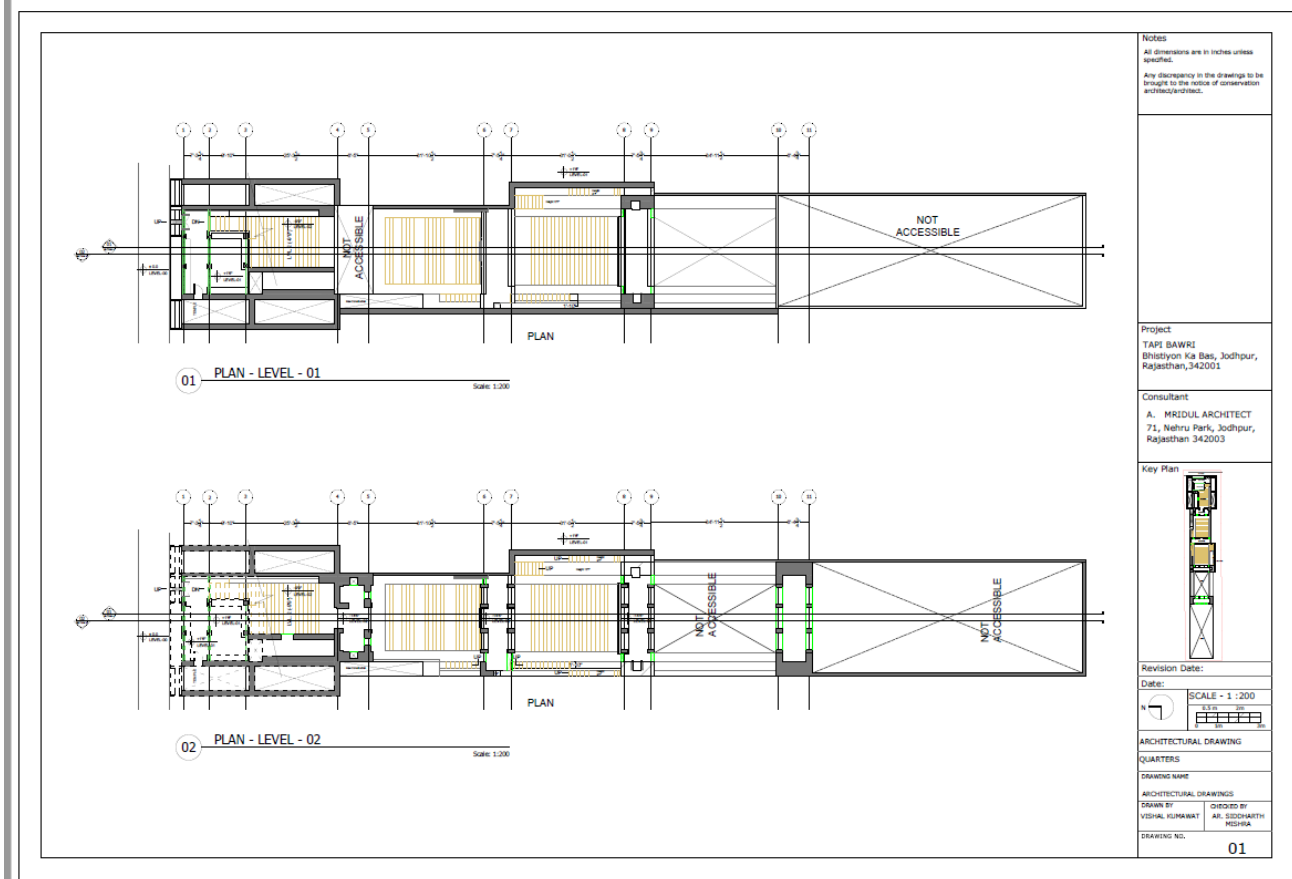
CHAPTER 2: ARCHITECTURAL DOCUMENTATION

The documentation of heritage buildings is a topic that has been discussed for a very long time to help safeguard valuable built heritage. It is usually the most fundamental and crucial process that can affect and facilitate any required procedures to preserve heritage buildings for the next generations. (Ahmed Khalil)

The documentation of heritage buildings also supports the development of a better understanding of the building's history; its historic socio-economic context, the building technologies employed, construction materials and, on a larger scale, our knowledge concerning its historic period and ancient societies. (Ahmed Khalil)

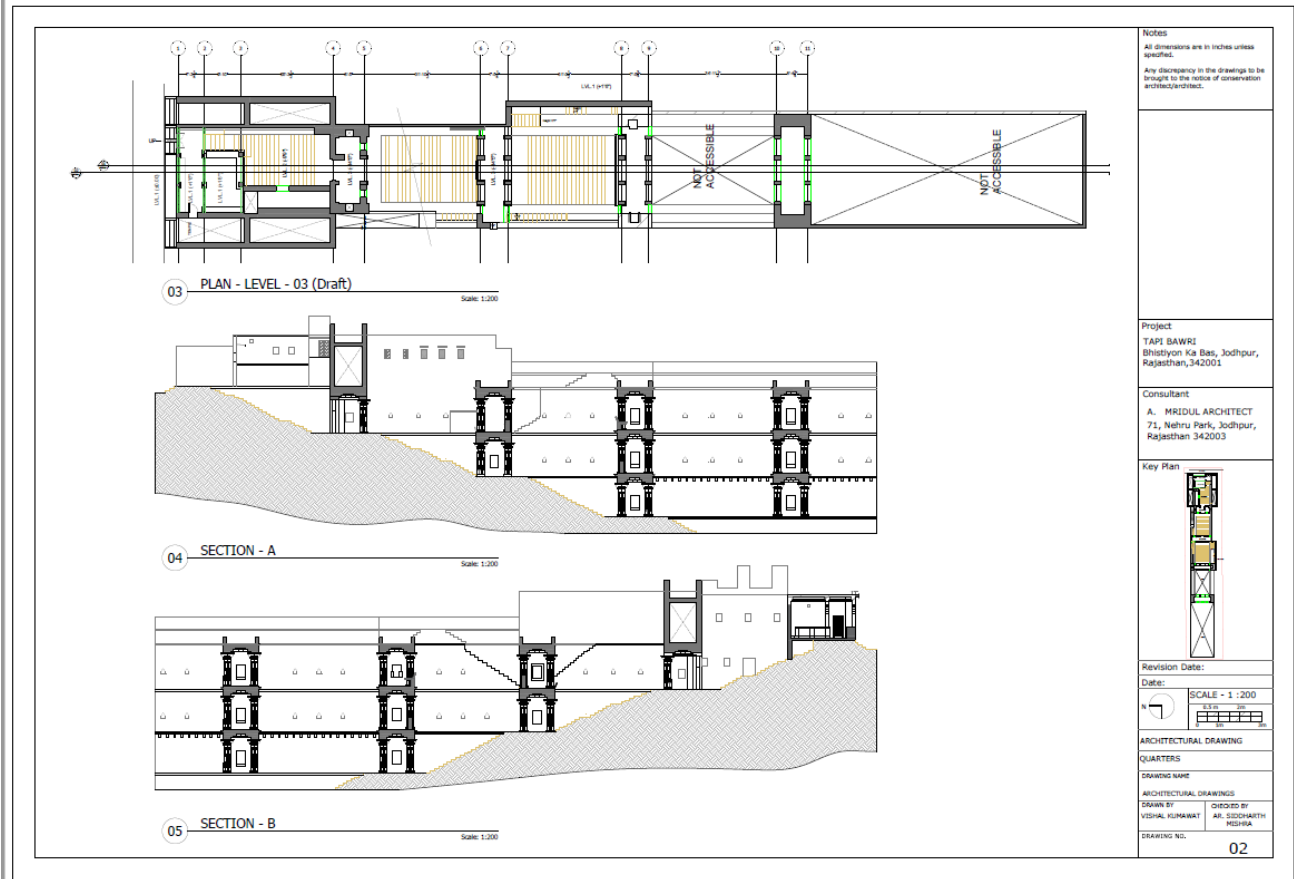
The Architectural drawings generated were used to assess the deterioration and structural damage. It also helped in identifying the character defining features of the Baodi to be protected and the documented. The measure drawings were also used to propose the restoration plan and help to implement the work through the same drawings.

Plan of Tapi Bawari



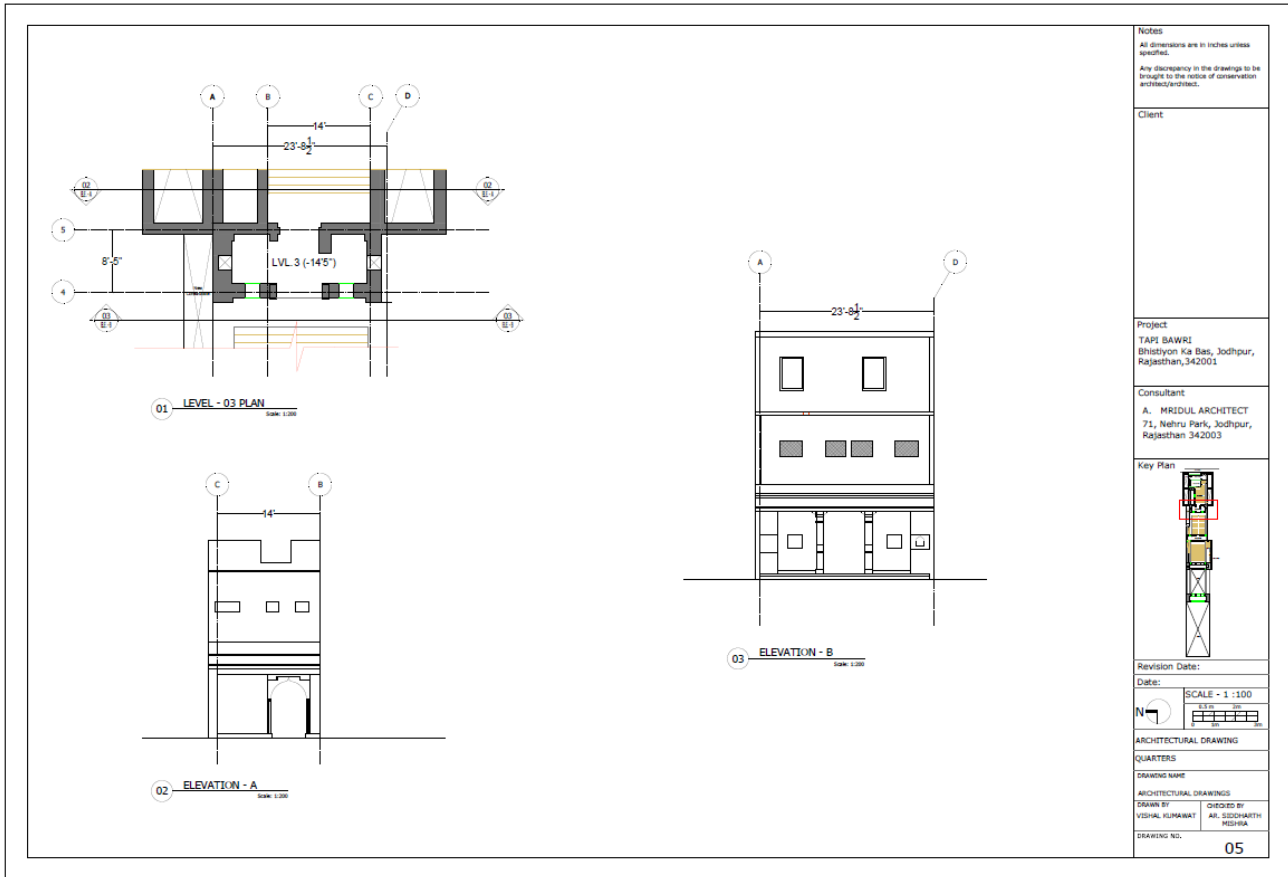
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Elevation and Site Section of Tapi Bawari



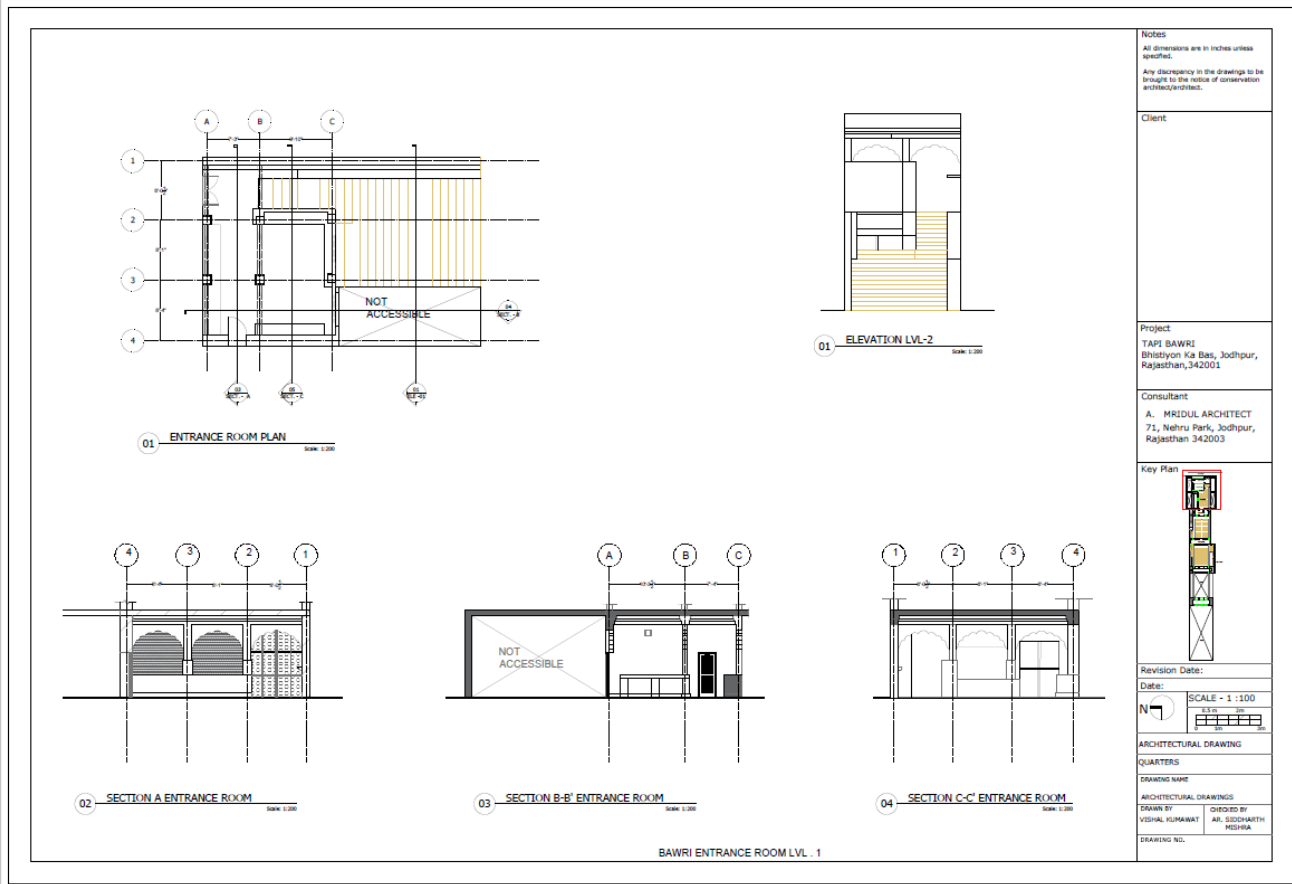
(Annexure-2)

Bawari Entrance intervention of Tapi Bawari



(Annexure-3)

Plan of later intervention of Tapi Bawari



(Annexure-4)

CHAPTER 3: CONDITION ANALYSIS

The condition Mapping was the next level of documentation. All surfaces were examined with non – invasive methods to record the condition. Along with Visual inspections. Condition Mapping was conducted at different level from exterior elevations to interior surfaces of Baodi.

The base measured drawings were used to map and inventory the list of defects and deteriorations identified on inspection. These in turn helped assess the condition and inform the decision on the proposed remedies and repair of the defects.

DETERIORATION AND IT'S TYPE

The action or process of becoming impaired or inferior in quality, functioning, or condition: the state of having deteriorated. (merriam-webster, n.d.)

During the survey different type of Deterioration was encountered in the Tapi Baodi Heritage Structure.

- (a) **Alterations:** - Modification of the material does not necessarily a worsening of its characteristics from the point of view of conservation. For instance, a reversible coating applied on a stone may be considered an alteration.

Causes:

- Factors unforeseeable at the early stage
- Total or partial change of use
- Change of ownership necessitating enlargement, extension, or other changes.
- Failure of building components
- Changing technological possibilities.
- Restoration of old monuments
- Wear and tear



Figure 9: Restoration of old monuments

(b) Alveolisation: - Formation, on the stone surface, of cavities (alveoles) which may be interconnected and may have variable shapes and sizes (generally centimetric, sometimes metric). Alveolization is a kind of is a differential weathering possibly due to inhomogeneities in physical or chemical properties of the stone.

Cases:

- Change in physical and chemical properties of stone
- Loosing of masonry
- Human intervention
- Biological habitation



Figure 10: Change in physical and chemical properties of stone

(c) Biological Deposits: - Colonization of the stone by plants and organisms such as birds, fishes', bacteria, cyanobacteria, algae, fungi and lichen (symbioses of the latter three). Biological colonization also includes influences by other organisms such as animals nesting on and in stone.

Cases:

- Vacant Spaces
- Sheltered Areas for Organisms
- Comfortable Environment
- Niches And Grooves Acting as safe Zones
- Small Cracks Act as Good Hiding

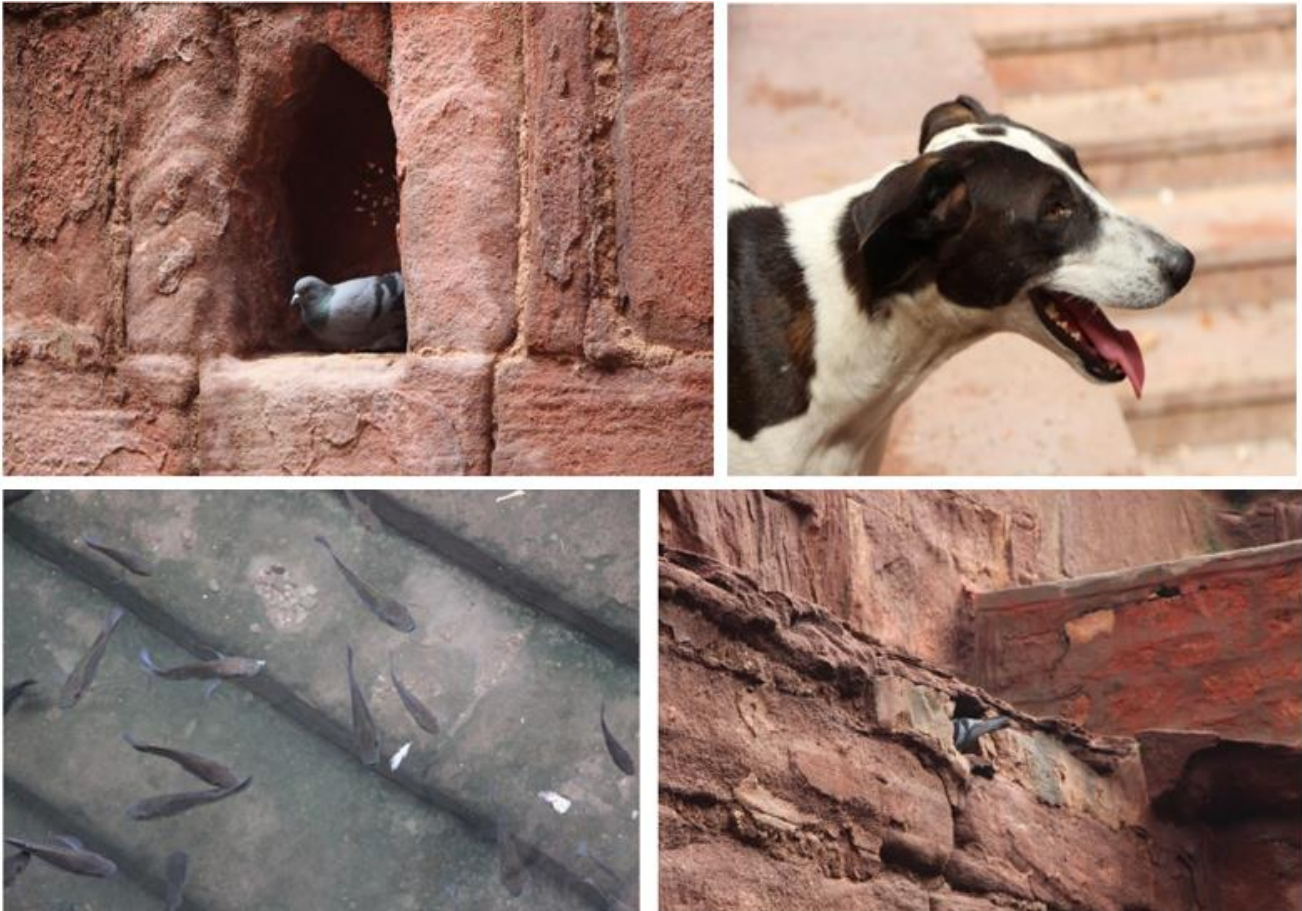


Figure 10: Sheltered Areas for Organisms

(d) Blistering: - Separated, air-filled, raised hemispherical elevations on the face of stone resulting from the detachment of an outer stone layer. This detachment is not related to the stone structure.

Cases:

- Moisture change
- Elastic deformation
- Change in temperature
- Corrosion of reinforcement
- Vegetation growth



Figure 11: Elastic deformation

(e) Cracks: - Individual fissures, clearly visible by the naked eye, result from the separation of one part from another. - Fracture: Crack that crosses completely the stone piece - Star cack: Crack having the form of a star. Rusting iron or mechanical impact are possible causes of this type of damage. - Hair crack : Minor crack with width dimension < 0.1 mm

Cases:

- Exposure of surface
- Natural wear and tear



Figure 12: Natural wear and tear

(f) Debris: - Scattered pieces of rubbish or remains. It also includes loose natural material consisting especially of broken pieces of rock.

Cases:

- Demolition
- Chipping
- Lack of maintenance
- Accumulation of chipped material



Figure 17: Debris

(g) Delamination: - Detachment process affecting laminated stones (most of the sedimentary rocks, some metamorphic rocks). It corresponds to a physical separation into one or several layers following the stone laminae. The thickness and shape of the layers is variable. The layers may be oriented in any direction regarding the stone surface.

Cases:

- Weathering
- Incorrect orientation of stones
- Natural phenomena
- Exposure of material for long periods



Figure 18: Different layers of stone is visible due to exposure to weathering

(h) Deformation: - Change in shape without losing integrity, leading to bending, buckling, or twisting of a stone block.

Cases: • Stress



Figure 19: Stress Deformation

(i) **Discoloration:** - Change the stone colour in one to three of the colour parameters: hue, value and chroma. - hue corresponds to the most prominent characteristic of colour (blue, red, yellow, orange etc.). - value corresponds to the darkness (low hues) or lightness (high hues) of a colour. - chroma corresponds to the purity of a colour. High chroma colours look rich and full. Low chroma colours look dull and greyish. Sometimes chroma is called saturation

Cases:

- Water run off
- Cracks
- Fractures
- Holes



Figure 110:Discoloration

(j) **Erosion and Weathering:** - Loss of original surface, leading to smoothed shapes. Any chemical or mechanical process by which stones exposed to the weather undergo changes in character and deteriorate.

Cases:

- Excessive vibrations
- Improper floating tool
- Damp
- Mineral released iron oxidation
- High water table

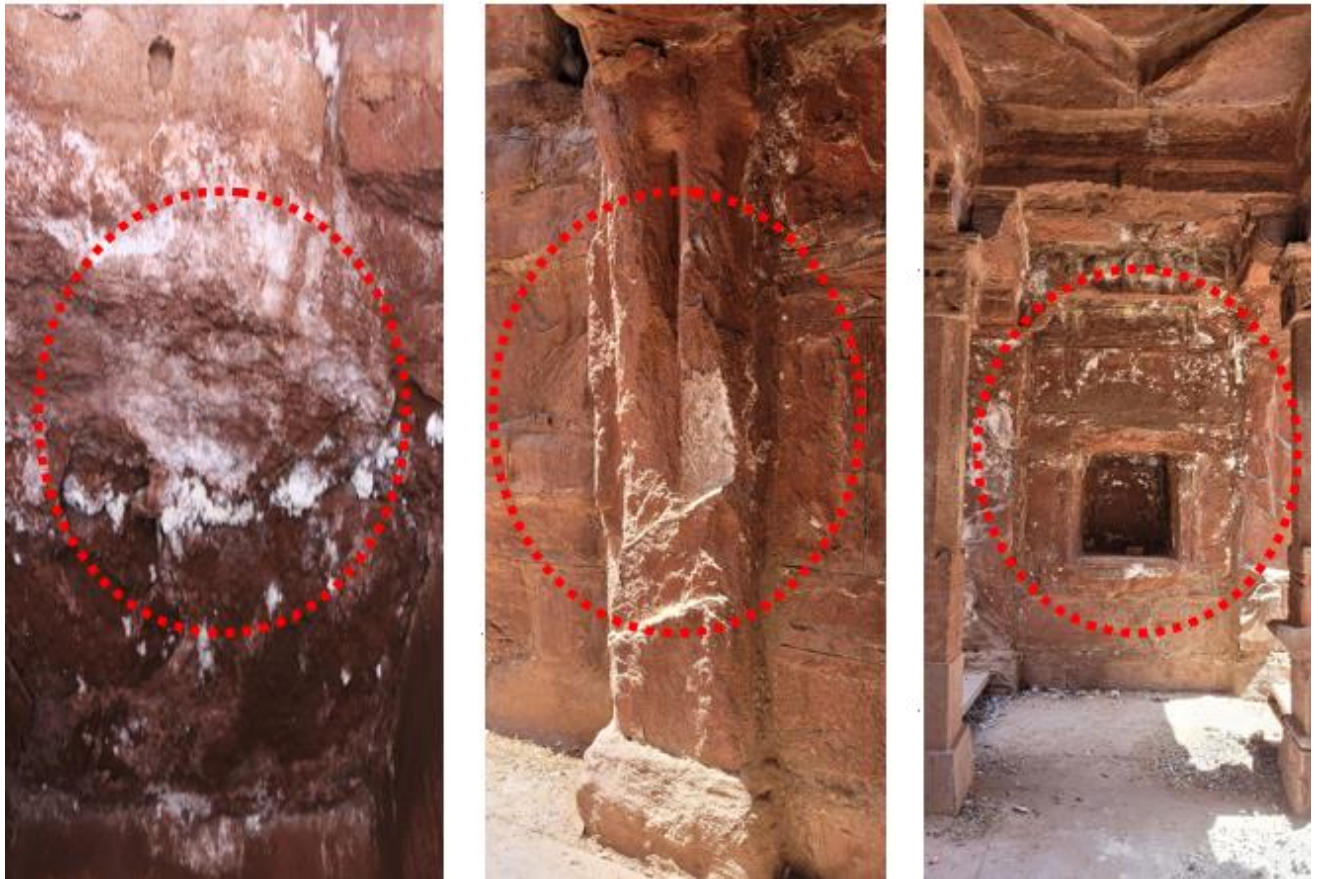


Figure 111: Erosion and Weathering

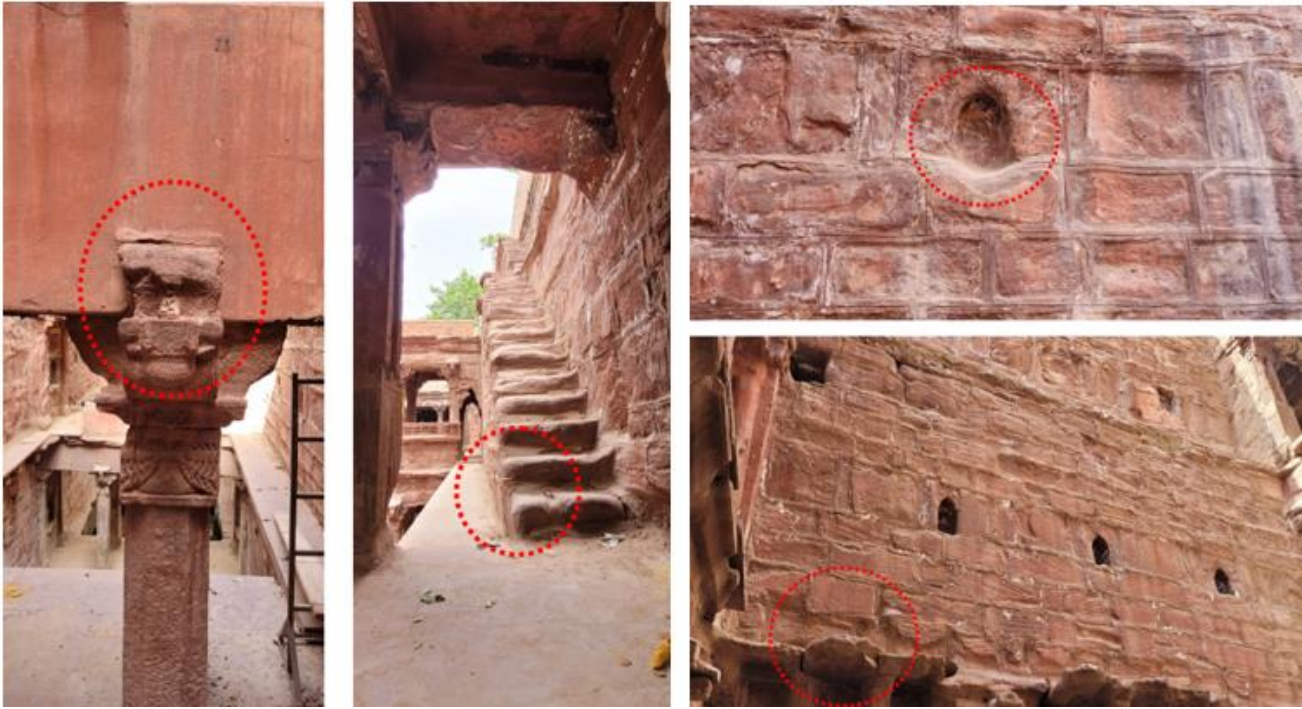


Figure 112: Erosion and Weathering

(k) Graffiti: - Engraving, scratching, cutting or application of paint, ink, or similar matter on the stone surface.

Cases:

- Human Intervention



Figure 113: Inking

(l) Later, Interventions: - Area in and around the Baodi was subjected to further construction. A temple was constructed in the periphery of the Baodi.

(1) Internal Intervention



Figure 14: Intervention

(2) External Intervention



Figure 15: Intervention

(m) Encrustation and Mikrokrast: - Network of small, interconnected depressions of millimetric to centimetric scale, sometimes looking like a hydrographic network. Mikrokarst patterns are due to a partial and/or selective dissolution of calcareous stone surfaces exposed to water run-off. Deposition of salt compounds on the walls.



Figure 16: Microkarst patterns

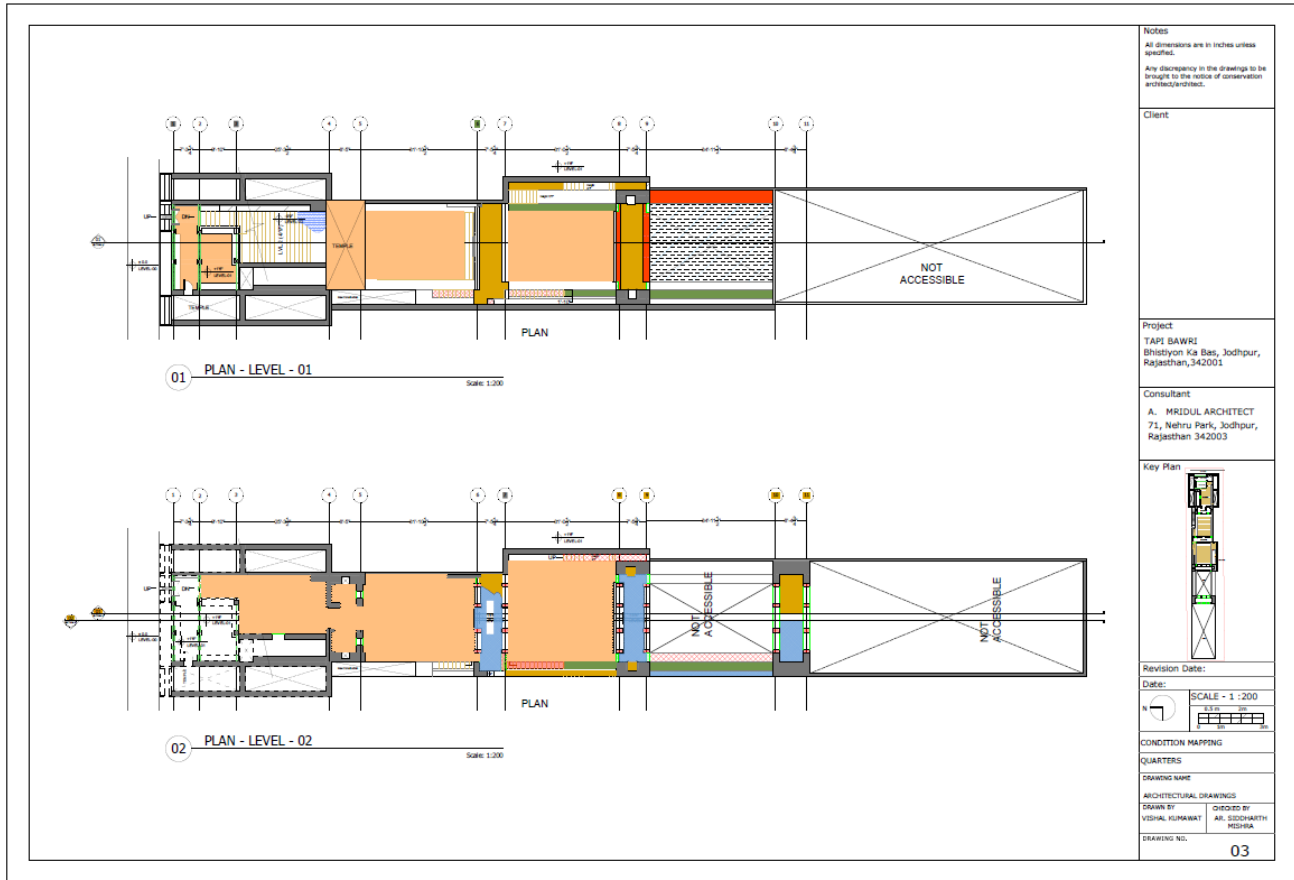
(n) **Mechanical Damage:** - Loss of stone material clearly due to a mechanical action.

Cases:

- Impact damage
- Key
- Cut
- Scratch
- Abrasion

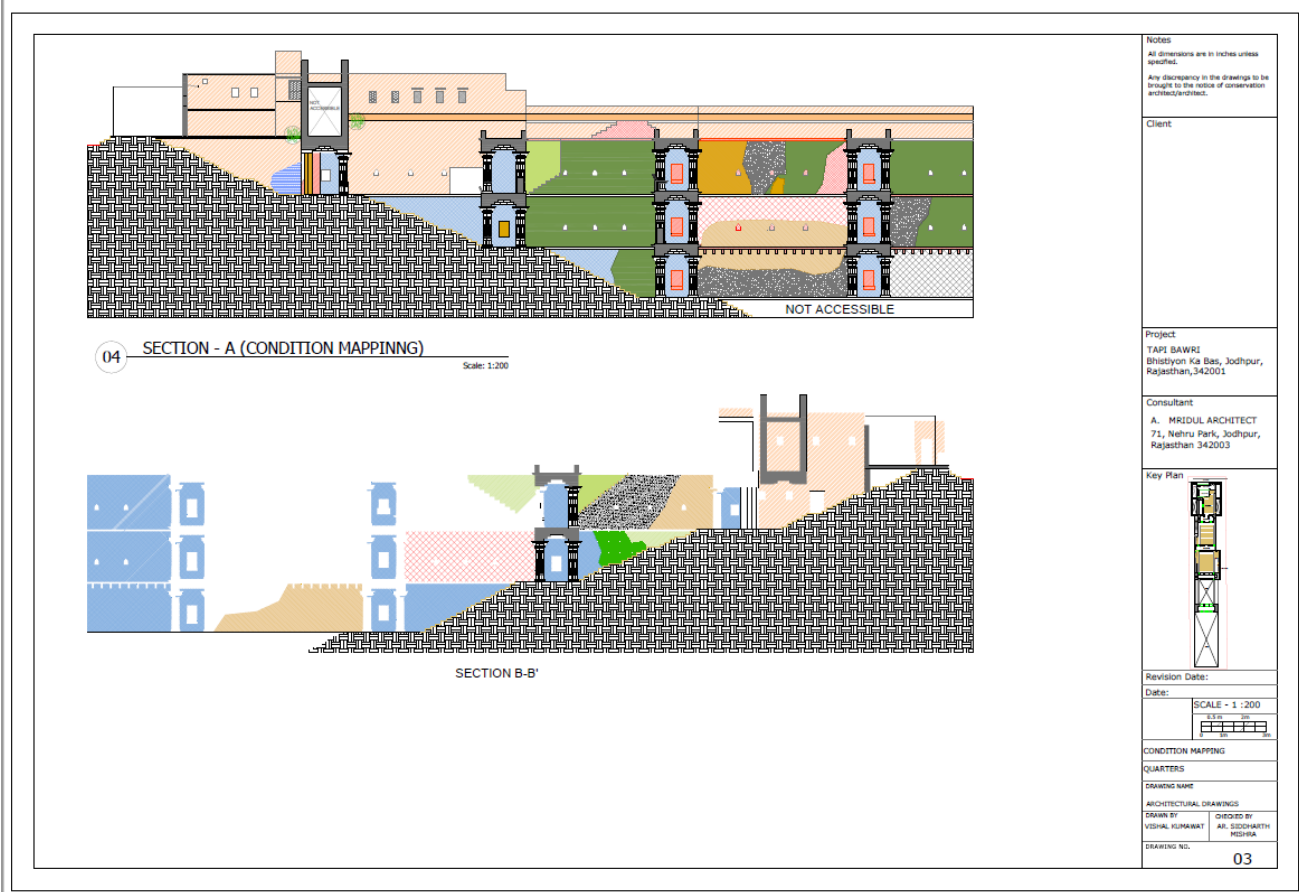


Condition Mapping Plan of Tapi Baodi



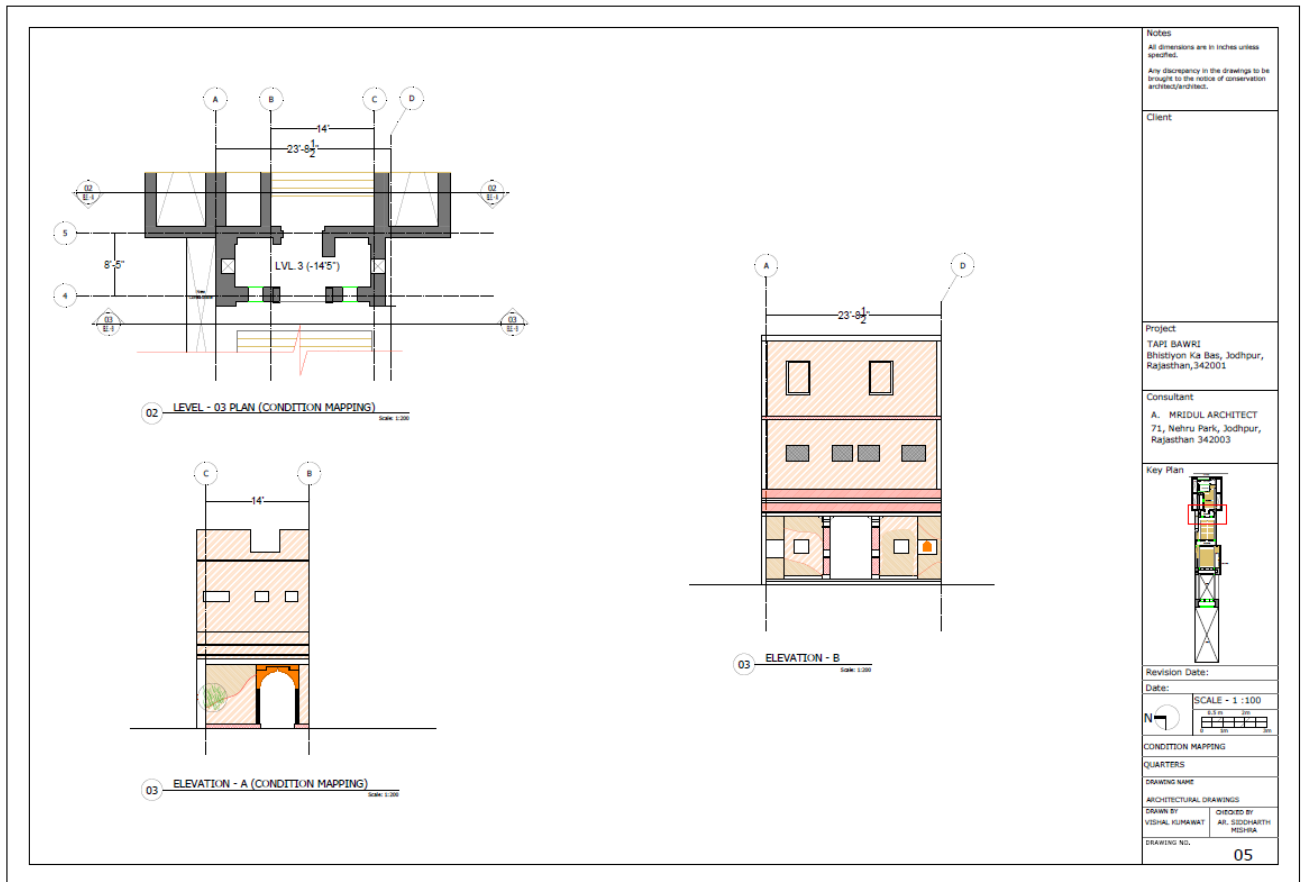
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Condition Mapping Site Sections of Tapi Baodi



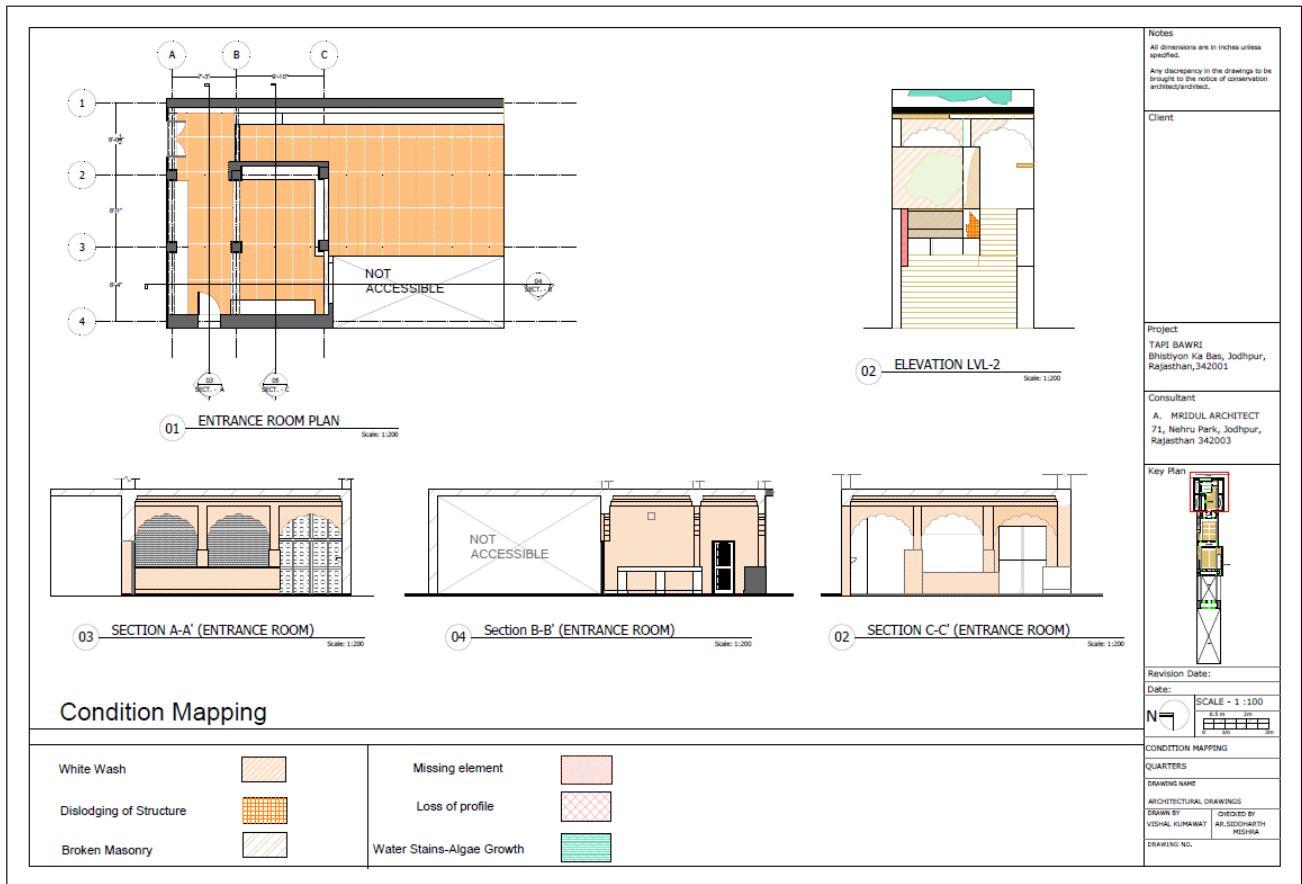
(Annexure-6)

Condition Mapping Entrance of Tapi Baodi



(Annexure-7)

Condition Mapping later Intervention Temple of Tapi Baodi



(Annexure-8)

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Manipal University Jaipur Leading the Way in Promoting Conscious Water Usage

Water is one of our planet's most vital resources, and its responsible use is paramount to ensure a sustainable future. Universities have a unique opportunity to educate and inspire change, not only on campus but also within the broader community. Manipal University Jaipur, located in Jaipur, Rajasthan, is at the forefront of promoting conscious water usage. Manipal University Jaipur actively encourages water conservation on campus and extends its efforts to make a positive impact on the surrounding community.

Conscious water usage involves being mindful of how we use water and adopting practices that reduce waste and protect this precious resource. Manipal University Jaipur recognizes that their actions can set an example for students, staff, and the community at large. Manipal University Jaipur has invested in water-efficient infrastructure across its campus. This includes low-flow faucets, water-saving toilets, and energy-efficient water heaters in all buildings. These measures significantly reduce water consumption. Campus landscaping is designed with water conservation in mind. Xeriscaping, which features drought-resistant native plants, is used extensively. Drip irrigation systems are employed to minimize water waste, and rain gardens capture and filter rainwater, reducing runoff. Manipal University Jaipur employs smart irrigation systems that adjust watering schedules based on weather data and soil moisture levels. This ensures that campus lawns and green spaces receive just the right amount of water, conserving resources. The university actively educates its students, faculty, and staff on the importance of water conservation. Awareness campaigns, workshops, and sustainability clubs involve the campus community in efforts to reduce water waste.

The university collaborates with local schools, environmental organizations, and government agencies to promote water conservation. This includes joint projects, workshops, and community events focused on sustainable water practices. Manipal University Jaipur's faculty and students engage in water-related research, providing valuable insights and solutions to water challenges in the community. This research benefits local industries, municipalities, and environmental organizations. Manipal University Jaipur leads by example through demonstration projects like greywater recycling systems and rainwater harvesting. These initiatives showcase sustainable practices that community members can replicate in their homes and businesses.

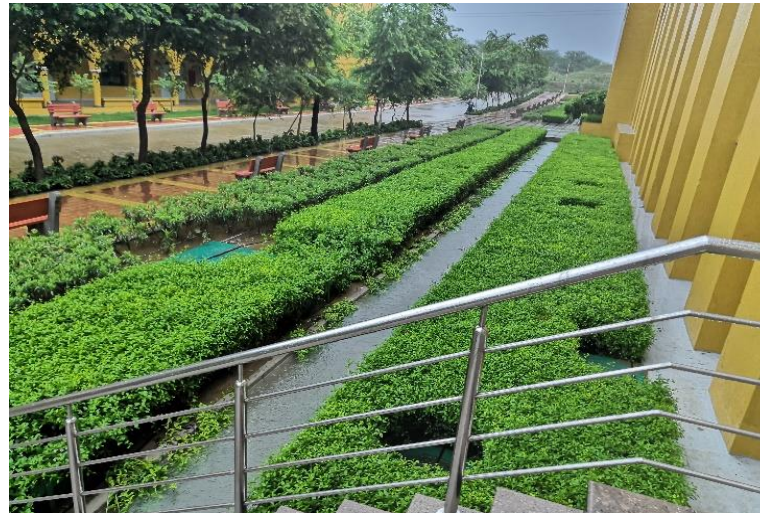
Manipal University Jaipur serves as a shining example of how a university can actively promote conscious water usage on its campus and within the broader community. By implementing sustainable infrastructure, educating its community members, and collaborating with external stakeholders, the university is making a meaningful impact on water conservation.

Water
Conservation
Facility at MUJ
Campus: Through
Rain Water
Harvesting





USAGE OF RECYCLE WATER



- Zero Water Discharge Campus (Water Recycling)
- Sludge From STP Used As Manure For Landscaping. Reusing the debris waste for the pathways and road areas base compaction
- Vehicle Washing
- Gardening and Horticulture

Rainwater Harvesting- Water Canals in Campus



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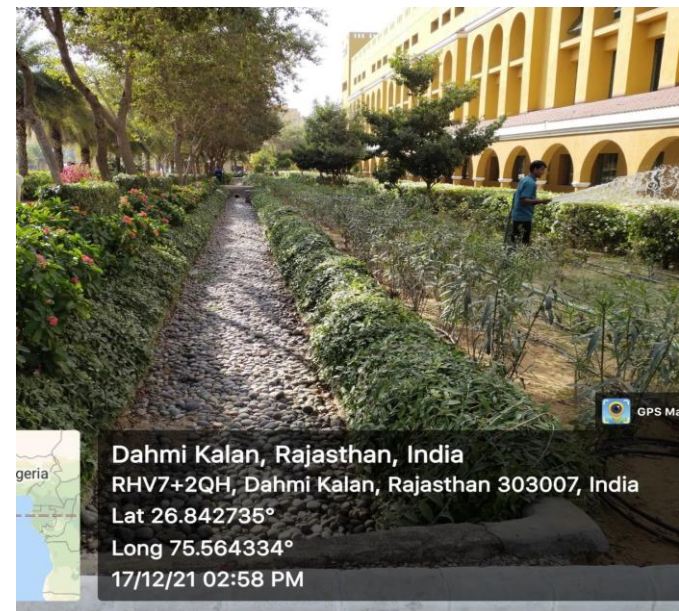
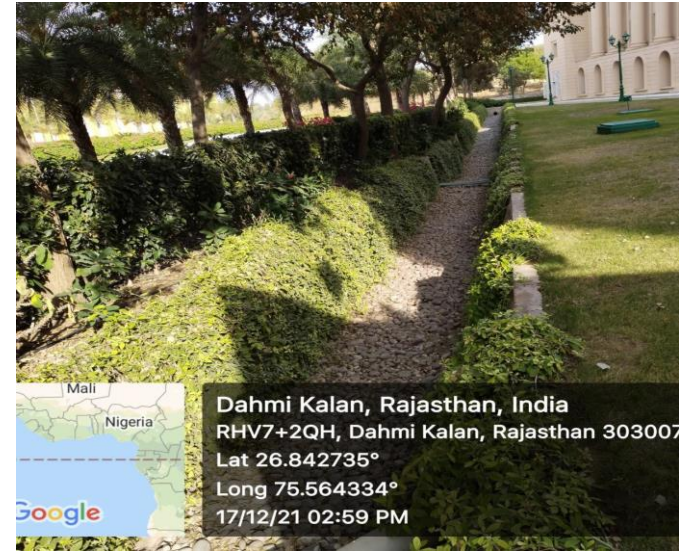


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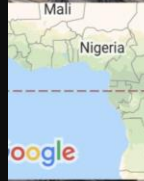
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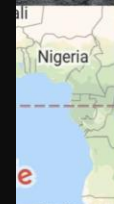
More than 14 KM of Water Canals in University for Water Harvesting



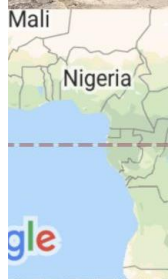
Peon Well Recharges Through Ponds



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Construction of Ponds





Construction of Ponds

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Dahmi Kalan, Rajasthan, India
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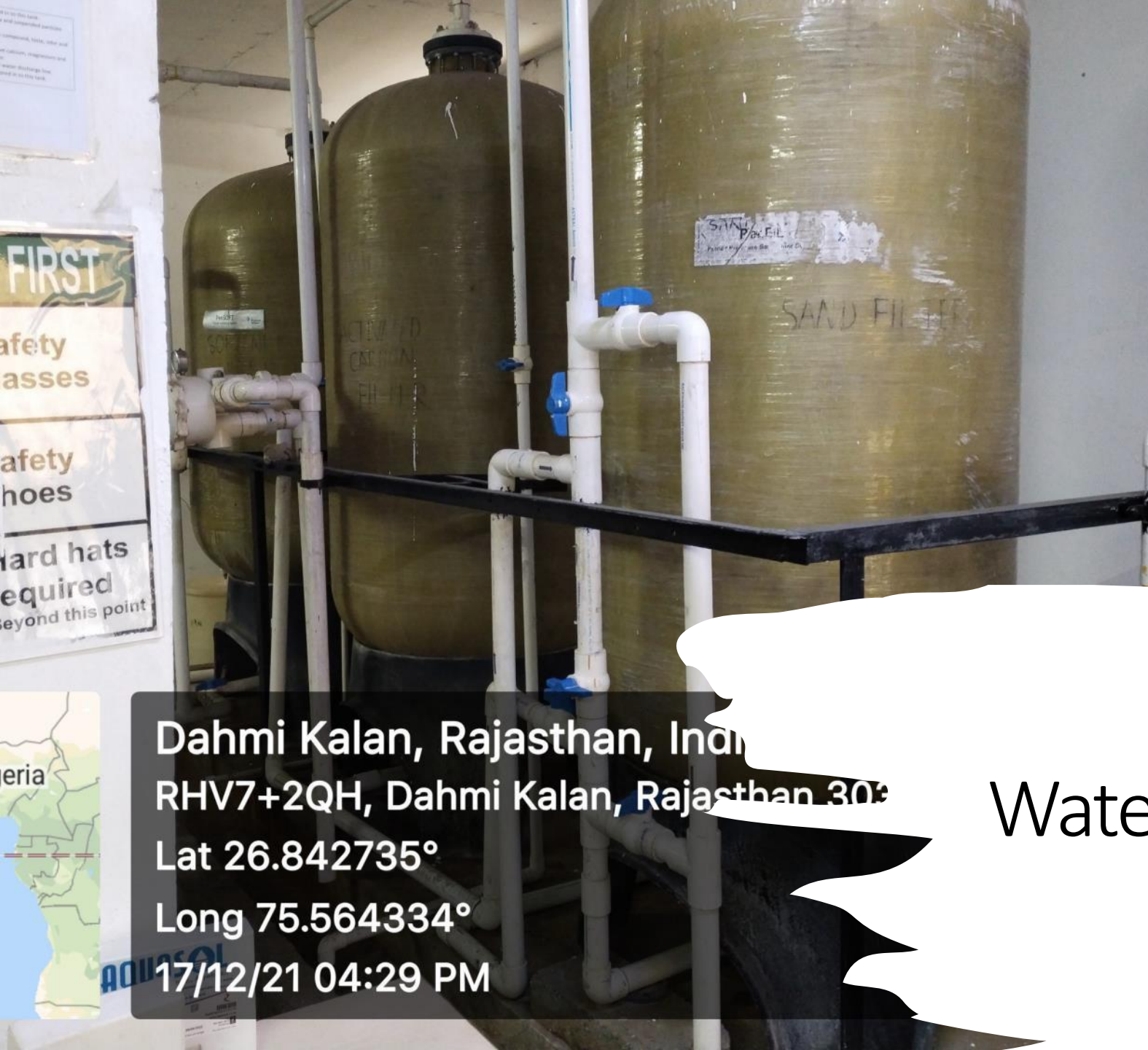
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Water Gathered in the Pond
During the Process of Rain
Water Harvesting





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Water Treatment Plants



Water Treatment Plants

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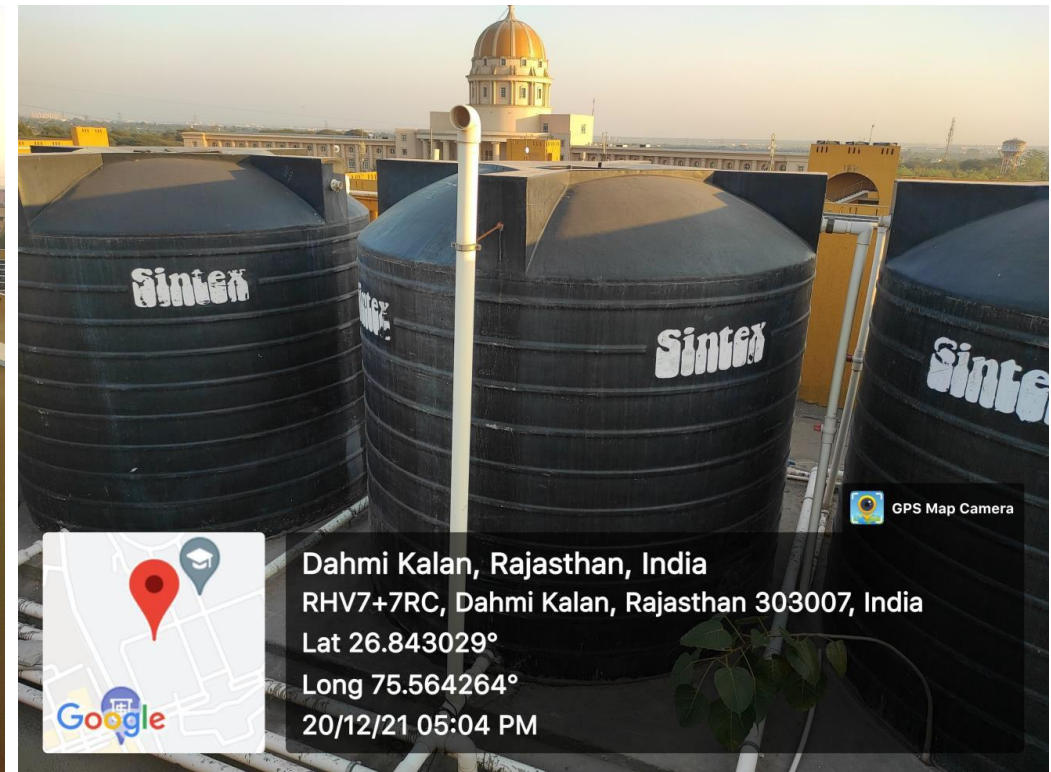
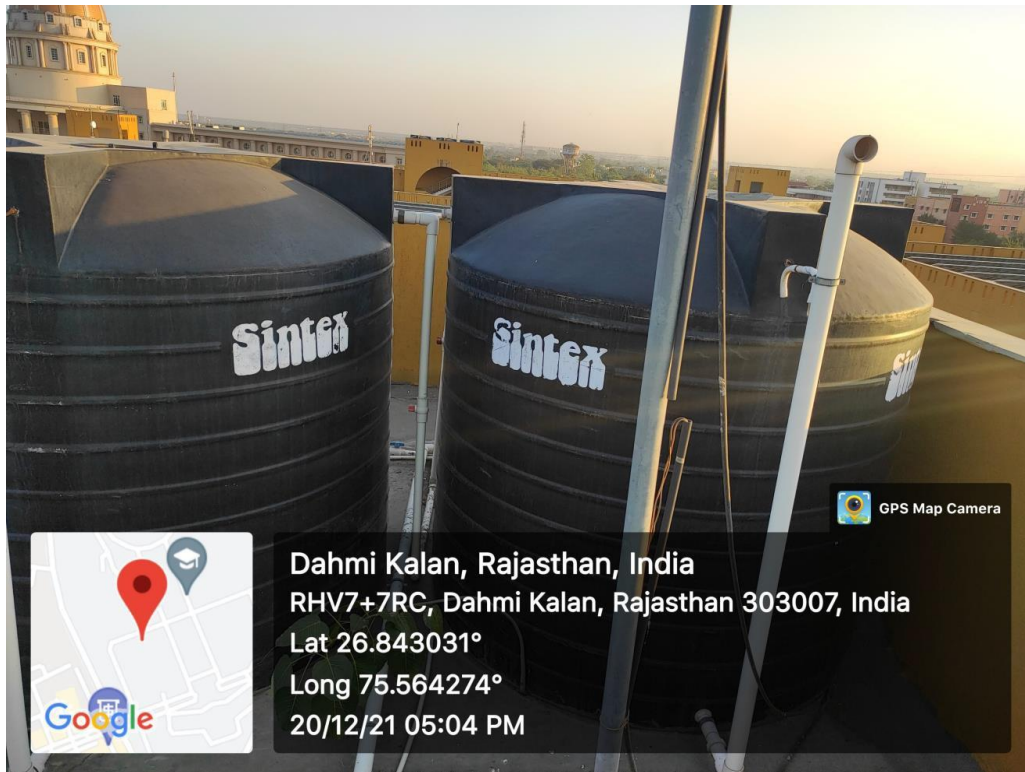
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Water Distribution System



Manipal University Jaipur Lead in Water Conservation Off Campus

Manipal University Jaipur empowers local communities to become more resilient in the face of water-related challenges, such as droughts or flooding. Prepared communities are better equipped to adapt and manage such situations effectively. The impact of university-led off-campus water conservation extends well into the future. The knowledge and practices instilled in local communities lead to immediate water savings and foster a culture of sustainability. As these practices become ingrained in daily life, communities are better equipped to adapt to changing environmental conditions and advocate for responsible water management.

Manipal University Jaipur engages with neighboring communities to raise awareness about water conservation. Manipal University Jaipur organizes workshops, seminars, and educational initiatives to inform residents about the importance of efficient water usage and conservation practices. Manipal University Jaipur collaborates with local water authorities and environmental organizations to develop comprehensive water conservation strategies. These partnerships leverage the expertise of academic researchers to address specific community needs. Manipal University Jaipur conducts research to assess local water resources and the impact of various activities on water availability. This research informs local policies and management practices for sustainable water use. Manipal University Jaipur implements practical water-saving measures off campus, such as rainwater harvesting systems, community gardens with efficient irrigation techniques, and educational programs that promote water-wise landscaping. Off-campus water conservation initiatives provide valuable learning opportunities for students who can engage in hands-on research and community projects, gaining practical experience in sustainability efforts.

By reducing water waste and promoting sustainable practices, universities contribute to the preservation of local ecosystems, especially in regions facing water stress and drought. Water conservation practices can lead to cost savings for both the university and the surrounding community. Lower water bills and reduced infrastructure maintenance expenses are among the direct economic benefits



SCHOOL OF WATER AND WASTE

AAETI

**ANIL AGARWAL ENVIRONMENT TRAINING INSTITUTE
(A UNIT OF CENTRE FOR SCIENCE AND ENVIRONMENT)**

CERTIFICATE OF COMPLETION

Online Training on Water Audit: A Tool for Water Conservation in Industries

Meena Kumari Sharma

This is to certify that Mr. / Ms. _____ has
successfully completed the online training on **“Water Audit: A Tool for Water Conservation in Industries”**
organised by the Centre for Science and Environment, New Delhi from **June 14 to June 27, 2022.**

With best wishes,

A handwritten signature in blue ink that reads 'Sunita Narain'.

Sunita Narain
Director General



Centre for Science and Environment
41, Tughlakabad Institutional Area
New Delhi-110 062 INDIA

Manipal University Jaipur
VPO - Dehmi Kalan, Near GVK Toll Plaza Jaipur-Ajmer Expressway Jaipur

Bank Payment Voucher

Voucher No. :

BP/22-23/000004502

Date: 13-09-22

Particulars	GL Code	Sub Code		Debit Amount	Credit Amount
	301240	BANK/00012	Travel Academic	3,500.00	
			DEPARTMENT-CIVIL ENGINEERING EMPLOYEE-MEENA KUMARI SHARMA FACULTY-FACULTY OF ENGINEERING SCHOOL-SCHOOL OF CIVIL & CHEMICAL ENGINEERING		
To	220120	BANK/00012	STATE BANK OF INDIA (OD A/c) - 40601753170		3,500.00
			DEPARTMENT-CIVIL ENGINEERING EMPLOYEE-MEENA KUMARI SHARMA FACULTY-FACULTY OF ENGINEERING SCHOOL-SCHOOL OF CIVIL & CHEMICAL ENGINEERING Cheque No: NEFT Dated: 13-09-22		
				3,500.00	3,500.00

Remarks : Dr. Meena Kumari/MUJ0446/CONFERNCE ATTENTED WORKSHOP WATER AUDIT-2022

Amount (in words):

Rs. THREE THOUSAND FIVE HUNDRED RUPEES AND ZERO PAISA ONLY

UTR No. -

Prepared by:

MUJDEEPAKB

Approved by:



S.No.	Application for support to attend Conference / Workshop / FDP/ Short term course	
1	Name of the faculty with Employee code	Dr Meena Kumari MUJ0446
2	Designation: School: Department: Date of joining: Contact number (Ext. & Cell) and Email-id:	Professor School of Civil and Chemical Engineering Civil Engineering 03/01/2015 8003988532 meena.kumari@jaipur.manipal.edu
3	Name of the event & its website address (if any)	ONLINE TRAINING ON WATER AUDIT: A TOOL FOR WATER CONSERVATION IN INDUSTRIES (https://www.cseindia.org/water-audit-a-tool-for-water-conservation-in-industries-11231)
4	Place and date of the event	India 14/06/2022 - 27/06/2022
5	Venue of the event	Online
6	Whether organized @ MUJ	No
7	Organizers of the event: Nature of the event:	Centre for Science & Environment National
8	Financial liability of MUJ, if any (provide the details)	Yes 3500.0000
9	Nature of Participation	Attendee
10	Event Necessity	Research area
11	Have you published paper through conference with indexing?	No
12	No. of SPCL required to attend this event: No. of SPCL availed so far:	9 1
13	Indexing of the conference (Scopus/ UGC / any other) (attach the proof)	Other
14	Advance Sanctioned Amount : Utilized Amount : Sanctioned Amount:	3500.0000 3500.0000
15	Title of the presented paper	Online Training on Water Audit: A Tool for Water Conservation in Industries
16	Highlights of the event	KEY LEARNINGS FROM THE PROGRAMME: Water audit – Introduction, Scope and Methodology Preparing industry specific water audit questionnaire Water audit instrumentation, metering and accounting Pre
17	What are the outcomes?	Understanding the relevance of the efficient wastewater treatment technologies, recycling and reuse practices which can bring down consumption and effluent generation. Further, substantial costs which

18	Whether your research work is recommended for publication	No
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Process History

ID	Entry Type	Statusname	Updated by	Updated date	Remarks	Event Type
00001133	Others	New	Dr Meena Kumari	14/06/2022		Pre Event Request
00001133	Others	Submitted	Dr Meena Kumari	14/06/2022		Pre Event Request
00001133	Others	Recommended by HOD	Dr Meena Kumari	14/06/2022	Recommended	Pre Event Request
00001133	Others	Recommended by DDR	Dr Vivek Kumar Verma	15/06/2022	Recommended as per MUJ Policy (Kindly apply for pre-event well before the event)	Pre Event Request
00001133	Others	Recommended by DOR	Dr Roheet Bhatnagar	15/06/2022	Recommended	Pre Event Request
00001133	Others	Recommended by DOS	Dr Bhavna Tripathi	21/06/2022	Recommended	Pre Event Request
00001133	Others	Recommended by DOF	Dr Arun Shanbhag	01/07/2022	Recommended as per MUJ Policy	Pre Event Request
00001133	Others	Pre-Event Approved	Dr Nitu Bhatnagar	06/07/2022	Approved	Pre Event Request
00001133	Others	New	Dr Meena Kumari	18/07/2022		Post Event Update
00001133	Others	New	Dr Meena Kumari	19/07/2022		Post Event Update
00001133	Others	New	Dr Meena Kumari	19/07/2022		Post Event Update
00001133	Others	New	Dr Meena Kumari	19/07/2022		Post Event Update
00001133	Others	New	Dr Meena Kumari	19/07/2022		Post Event Update
00001133	Others	Post Event Submitted	Dr Meena Kumari	19/07/2022		Post Event Update
00001133	Others	Recommended by HOD	Dr Meena Kumari	19/07/2022	Recommended	Post Event Update
00001133	Others	Post Event Rework	Dr Vivek Kumar Verma	28/07/2022	Kindly attach supporting documents with the Expense report	Post Event Update

00001133	Others	Post Event Submitted	Dr Meena Kumari	28/07/2022		Post Event Update
00001133	Others	Recommended by HOD	Dr Meena Kumari	28/07/2022	Recommended	Post Event Update
00001133	Others	Post Event Rework	Dr Vivek Kumar Verma	29/07/2022	Kindly attach supporting documents with the Expense report	Post Event Update
00001133	Others	Post Event Submitted	Dr Meena Kumari	29/07/2022		Post Event Update
00001133	Others	Recommended by HOD	Dr Meena Kumari	29/07/2022	Recommended	Post Event Update
00001133	Others	Recommended by DDR	Dr Vivek Kumar Verma	06/08/2022	Recommended	Post Event Update
00001133	Others	Recommended by DOR	Dr Roheet Bhatnagar	07/08/2022	Recommended	Post Event Update
00001133	Others	Recommended by HR	Mr Kamlesh Kumar Bagda	20/08/2022	Recommended	Post Event Update
00001133	Others	Recommended by CF&AO	Dr Pradeep Chaturvedi	26/08/2022	approved	Post Event Update
00001133	Others	Post-Event Approved	Dr Rajendra Kumawat	13/12/2022	approved	Post Event Update

i.To be submitted to finance department with hard copies of all original receipts/uploaded documents.

Signature of faculty (with date).

"Autogenerated from Research Data Management System (RMS), Manipal University Jaipur on 20-04-2023"



SCHOOL OF WATER AND WASTE

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**ANIL AGARWAL ENVIRONMENT TRAINING INSTITUTE
(A UNIT OF CENTRE FOR SCIENCE AND ENVIRONMENT)**

CERTIFICATE OF COMPLETION

Online Training on Water Audit: A Tool for Water Conservation in Industries

Sagar Gupta

This is to certify that Mr. / Ms. _____ has
successfully completed the online training on **“Water Audit: A Tool for Water Conservation in Industries”**
organised by the Centre for Science and Environment, New Delhi from **June 14 to June 27, 2022.**

With best wishes,

A handwritten signature in blue ink that reads 'Sunita Narain'.

Sunita Narain
Director General



Centre for Science and Environment
41, Tughlakabad Institutional Area
New Delhi-110 062 INDIA

S.No.	Application for support to attend Conference / Workshop / FDP/ Short term course	
1	Name of the faculty with Employee code	Mr Sagar Gupta MUJ0495
2	Designation: School: Department: Date of joining: Contact number (Ext. & Cell) and Email-id:	Associate Professor(senior scale) School of Civil and Chemical Engineering Civil Engineering 25/06/2015 +91783788898 sagar.gupta@jaipur.manipal.edu
3	Name of the event & its website address (if any)	Sagar Gupta (https://www.cseindia.org/basic-laboratory-training-in-faecal-sludge-management-11299)
4	Place and date of the event	India 26/07/2022 - 30/07/2022
5	Venue of the event	Anil Agarwal Environment Training Institute (AAETI), Nimli, Rajasthan
6	Whether organized @ MUJ	No
7	Organizers of the event: Nature of the event:	centre for science & environmental National
8	Financial liability of MUJ, if any (provide the details)	Yes 3500.0000
9	Nature of Participation	Attendee
10	Event Necessity	OTHERS
11	Have you published paper through conference with indexing?	No
12	No. of SPCL required to attend this event: No. of SPCL availed so far:	05 07
13	Indexing of the conference (Scopus/ UGC / any other) (attach the proof)	Other
14	Advance Sanctioned Amount : Utilized Amount : Sanctioned Amount:	3500.0000 3500.0000
15	Title of the presented paper	Online course on water audit
16	Highlights of the event	1. toolkits for water audits. 2. scooping projects for water audits and several niche parameter for measuring of water flow and pumping.3. requirement and areas in which water audits need to applied.
17	What are the outcomes?	1. certification for water audit projects. 2. able to develop tailored solution for water auditing.
18	Whether your research work is recommended for publication	No

Process History

ID	Entry Type	Statusname	Updated by	Updated date	Remarks	Event Type
00001167	Workshop	New	Mr Sagar Gupta	18/07/2022		Pre Event Request
00001167	Workshop	Submitted	Mr Sagar Gupta	18/07/2022		Pre Event Request
00001167	Workshop	Recommended by HOD	Dr Meena Kumari	18/07/2022	Recommended	Pre Event Request
00001167	Workshop	Recommended by DDR	Dr Vivek Kumar Verma	25/07/2022	Recommended	Pre Event Request
00001167	Workshop	Recommended by DOR	Dr Roheet Bhatnagar	25/07/2022	Recommended	Pre Event Request
00001167	Workshop	Recommended by DOS	Dr Bhavna Tripathi	25/07/2022	Recommended	Pre Event Request
00001167	Workshop	Recommended by DOF	Dr Arun Shanbhag	28/07/2022	Approved	Pre Event Request
00001167	Workshop	Pre-Event Approved	Dr Nitu Bhatnagar	03/08/2022	Approved	Pre Event Request
00001167	Workshop	New	Mr Sagar Gupta	18/08/2022		Post Event Update
00001167	Workshop	Post Event Submitted	Mr Sagar Gupta	18/08/2022		Post Event Update
00001167	Workshop	Recommended by HOD	Dr Meena Kumari	18/08/2022	Recommended	Post Event Update
00001167	Workshop	Recommended by DDR	Dr Vivek Kumar Verma	24/08/2022	Recommended	Post Event Update
00001167	Workshop	Recommended by DOR	Dr Roheet Bhatnagar	27/08/2022	Recommended	Post Event Update
00001167	Workshop	Recommended by HR	Mr Kamlesh Kumar Bagda	05/09/2022	Recommended	Post Event Update
00001167	Workshop	Recommended by CF&AO	Dr Pradeep Chaturvedi	24/09/2022	approved	Post Event Update

i.To be submitted to finance department with hard copies of all original receipts/uploaded documents.

Signature of faculty (with date).

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Effective salt removal from domestic reverse osmosis reject water in a microbial desalination cell

Aman Dongre¹ · Nitesh Kumar Poddar¹ · Rakesh Kumar Sharma¹ · Monika Sogani¹

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Abstract

Microbial desalination cells (MDC) are evaluated as an environmentally friendly approach for purifying saline water by using power generated by the decomposition of organic materials in the wastewater. The present study is to evaluate the ferrocyanide-redox and biocathode approach in treating simulated saline water and subsequently recovering bio-electricity using actual domestic reverse osmosis reject water. For the desalination of simulated saline water and domestic reverse osmosis reject water, a three-chamber microbial desalination cell with graphite electrodes and anion and cation exchange membranes was constructed. When treating simulated saline water, the biocathode technique achieved a 5% improvement in salt removal and a 4.9% increase in current and power density when compared to the ferrocyanide-redox approach. When biocathode MDC was used to treat domestic reverse osmosis reject water, a maximum current and power density of 3.81 $\mu\text{A}/\text{cm}^2$ and 0.337 $\mu\text{W}/\text{cm}^2$, respectively, were recorded, as well as COD removal of 83.9% at the desalination chamber and ions reduction for Na, K, and Ca of up to 79%, 76.5%, and 72%, respectively, in a batch operation for 31 days with a stable pH (≈ 7). Thus, the study revealed a microbial desalination cell capable of recovering bioenergy and reducing salt from domestic reverse osmosis reject water with a consistent pH range.

Keywords Microbial desalination cells · Biocathode · RO reject water

Introduction

Currently, around 690 million people in the world have no access to potable water and the situation is predicted to worsen exponentially to 2 billion individuals in the near future (Talbot 2015). Water resources are showing scarcity due to the increased demand for potable water in domestic as well as industrial areas in almost all the continents of the world, resulting in the modern age's water shortage issues (Water Scarcity 2019; Baggio et al. 2021).

As a result of ever-increasing worldwide demand for potable water, innovative desalination techniques have a significant impact across the world (Badiuzzaman et al. 2017; Chowdhury et al. 2018; Tzanakakis et al. 2020). Hefty energy expenses, on the other hand, remain a big worry as

energy accounts for about 74% of desalination expenditure for the whole treatment process (Elmekawy et al. 2014; Ding et al. 2021). This increases the cost of water desalination by roughly tenfold when compared with natural water treatment and supply, resulting in high prices for potable water. Reverse osmosis or R.O. with corresponding the usage of energy of 3.2 kWh/m³ with a 50% recovery rate is the most advanced desalination treatment method in this sense (Ramírez-Moreno et al. 2019). The technologies aimed at temperature control, like multi-step flash and multi-effect distillation, use about 5.5–40 kWh/m³ of energy, which is even greater (Sharon and Reddy 2015; Hemmat Esfe et al. 2021). Currently, reverse osmosis rejects water and residential sewage water are the most common wastewaters that are released into water bodies without being treated (Reddy et al. 2018). RO reject is a mixture of pre-treatment chemicals and concentrated feed water that eventually becomes a significant component of domestic wastewater (Panagopoulos and Haralambous 2020; Vigneswaran et al. 2021). Approximately, 79% of the water designated for houses for domestic consumption is returned as sewage water (Reddy et al. 2018). For disposing of RO reject, methods like as

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deep well injection and discharge onto surface waters are frequently used, although these approaches have caused serious environmental risks (Reddy et al. 2018). Wastewater reclamation and reuse are the sole options for finishing the water cycle, minimizing water crises, and mitigating severe environmental consequences (Vergine et al. 2017), however, most of these systems are unable to withstand the high salinity and heavy metal concentrations of RO reject (Giwa et al. 2017). Vigneswaran et al. 2021 conducted a study that the negative effects of untreated reject water from RO plants dumped into the soil system. The findings clearly demonstrated the decline of soil and ground water quality over time owing to ion build-up in the environment. Using RO concentrate for irrigation or direct discharge into the soil, on the other hand, may increase soil salinity and alkalinity. As a result, untreated direct discharge of RO concentrate into the soil may have a deleterious influence on soil quality and health (Panagopoulos and Haralambous 2020; Vigneswaran et al. 2021). Microbial fuel cell-based desalination is fundamentally appropriate for saline water treatment as electricity expenses are according to the salinity variations of the water input (Dwivedi et al. 2022). Other modernized membrane technologies like capacitive deionization, forward osmosis, and membrane distillation are used to treat the type of water on the basis pollutants (Yuan et al. 2012; Shaffer et al. 2015; Wang and Chung 2015; Pawlak-Kruczek et al. 2020).

A new way forward for potable water generation is the microbial desalination cell (MDC), utilizing the energy supply from electroactive microbial metabolism digesting organic matter with simultaneous desalination of water and providing power output as well. MDC consists of a three-compartment electrochemical unit (Liang et al. 2009; Yahi-aoui et al. 2021). MDC contains a biofilm-based electrode that oxidizes the organic substance in anolyte and catholyte, which is necessary to transport electrons from organic compounds to the electrolyte interface. The electrons enter the cathodic chamber via an external circuit, where the reduction occurs, and ion movement is driven by the electrical potential. Desalination of the wastewater occurs when cations ions travel from the desalination compartment to the cathode via the cation exchange membrane and anions ions pass from the desalination compartment to the anodic compartment via the anion exchange membrane. Liang et al. primarily introduced the definition of MDC in a 9 cm² cell, with a saline volume of 11 mL at an initial salt concentration in a range of 5–35 g/L of NaCl with batch reactions reporting about 90% of the salt elimination (Liang et al. 2009).

Several modifications for MDC have been discussed previously, like tubular or cubic reactors (Mehanna et al. 2010a; Jacobson et al. 2011a, b; Ping et al. 2013; Gujjala et al. 2022), multiple stacked cells (Chen et al. 2011; Kim and Logan 2011; Tawalbeh et al. 2020), batch recirculation cycles in cells (Morel et al. 2012; Qu et al. 2012;

Tawalbeh et al. 2020) using microbes in cathode chamber as well, termed as biocathodes (Chen et al. 2012; Gujjala et al. 2022), or integrating prototype membranes (Zhang and He 2012, 2013; Sevdá et al. 2015; Gujjala et al. 2022) and ion exchange resins in the sections (Zhang and He 2012; Gujjala et al. 2022). Till date, fractional desalination of sea water was achieved with a nominal rate of 0.077 Lm²/h and is considered to be the largest microbial desalination cell operated with a reaction volume of 100 L (Zhang and He 2015; Salehmin et al. 2021). Many studies have shown that organic matter in wastewater can be used to generate electricity and that the test saline sample is desalinated individually in the MDC. It has not yet been reported in the literature that changes in COD, pH, electrical conductivity, or other parameters in the MDC, especially focused on the electrolyte or test water sample in the desalination chamber. This is because microbial growth would not be possible to grow in the Domestic R.O. Reject Water with low organic content and high COD levels. The major impediment in electrochemical microbial technologies is the cathodic reaction (Lee et al. 2021). Much of the microbial desalination cell studies were done using the information gathered by microbial fuel cell systems that use oxygen as a dominant electron acceptor in the cathodic chamber. The improvement of air cathodes possessing high oxygen reduction reactions, high stability, and low prices are a few challenges that require addressing (Lu and Li 2012; Nie et al. 2021). Zhao et al. Identified three prime factors that influence the efficacy of air cathodes namely pH, the concentration of catholyte, and catalysts if used (Zhao et al. 2006). Despite the widespread use of oxygen as a terminal electron acceptor in electrochemical microbial cells, a ferricyanide catholyte was used to establish the proof of the MDC principle with about 94% salt removal up to 94%, and 2 W/m² of energy produced. Thus, naturally improving the system's performance when compared to using oxygen reduction reactions at the cathode. Nevertheless, due to the high price, the use of ferricyanide catholyte can only be feasible if the redox mediator is economic or an inexpensive method is developed to be used upon depletion (Zahid et al. 2022). Compared to abiotic cathode MDCs, biocathode MDCs have higher promise in wastewater treatment since organic matter may be reduced further by biofilm on the working electrode. Biocathode MDCs are also more durable and have lower operating costs (Zhou et al. 2016; Yang et al. 2017).

There has been few research focusing on the makeup of microbial communities and the detection of functional microorganisms in MDC. Harshita et al. (2019) employed constructed MFCs in the anode chamber to generate voltage using various bio-wastes such as cow manure and sludge. Using about 1% cow dung slurry, voltage output of around 229 mV was achieved suggesting the use of cow dung for wastewater treatment (Harshitha et al. 2019;

Naik and Jujjavarappu 2020). It has been found that MDCs with pure microbial cultures have lower power generating capacity than those with mixed microbial cultures (Guang et al. 2020a). Pure cultures, on the other hand, are extremely valuable for elucidating the electron transfer process at the microbiological and molecular levels, as well as reducing the complexity that comes with mixed cultures (Guang et al. 2020a). For example *Shewanella* spp. employ a variety of ways to transport electrons outside the cell, including direct electron transfer through contact, the utilization of cytochromes, and the use of conductive nanowires in cytochromes (Guang et al. 2020a). Because these pure cultures use one or two-electron transfer pathways, these processes are easily identified, and future research may focus on optimizing them for similar goals. A pure culture of *Bacillus velenzeus* strain AD1-ELB, as previously identified, is also utilized in this study (Guang et al. 2020b; Dongre et al. 2022). When MDC is used for real-world R.O. reject water treatment, the microbial population may be more diversified (Siddiqui et al. 2021). As a result, an in-depth study of functional microorganisms is required to comprehend the salt removal mechanism, electricity production, and desalination performance in the anode, cathode, and desalination chambers which are currently lacking in this study. To broaden the practical application of MDC, it is worthwhile to investigate their performance in domestic R.O. Reject water treatment, particularly ion migration, which can have negative effects on the water in the surrounding environment if disposed of directly and continuously for an extended period of time. In this study, MDC was constructed and used to desalinate firstly simulated saline water and then domestic R.O. reject water in microbial desalination cell setup with graphite electrode assembly. Finally, salt removal, changes in COD and conductivity of the desalination chamber, as well as MDC stability and characterization in terms of current and

power density were demonstrated along with the advantages and disadvantages of the fabricated MDC methods.

Materials and methods

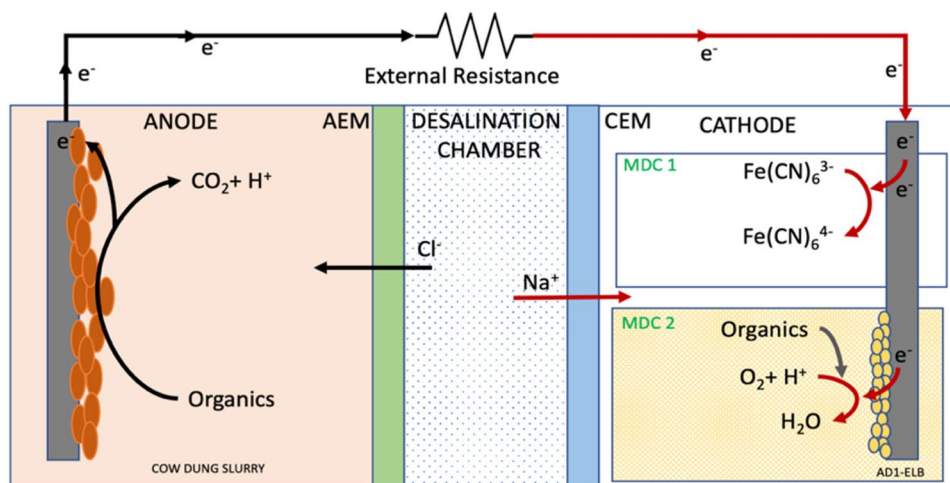
Microbial desalination cell (MDC) construction

The proposed MDC consisted of three polypropylene tubular compartments (diameter 6 inches) stacked sequentially in a horizontal arrangement having a total volume of 100 ml each (Fig. 1). Graphite sheet ($4 \times 3 \times 0.5$ cm) grade FC-GR347B was used as electrodes in both anode and cathode chambers. The separators for the three chambers were anion and cation exchange membranes, namely Fumasep FAS PET 75 for separating the anode chamber from the desalination chamber and Fumasep FKB PK 130 for separating the desalination chamber from the cathode chamber. Both the graphite sheet and ion exchange membranes were ordered from Fuel Cell Store (Texas, USA).

Experimental setup

Two types of MDC setups were examined to treat standardized simulated saline water sample, with the best performing one being used to treat domestic R.O. reject water. MDC setup1 consisted of *Bacillus velenzeus* strain AD1-ELB, cultured as anolyte in the anode chamber and 100 mL of $K_3Fe(CN)_6$ solution of 100 mM concentration as catholyte in the cathode chamber making it a Ferrocyanide-redox MDC. The *Bacillus velenzeus* strain AD1-ELB was identified as an electrogenic bacteria and isolated from cow dung in a recent study (Dongre et al. 2022) and used in the MDC setups. The MDC setup 2 included *Bacillus velenzeus* strain AD1-ELB in anolyte, while catholyte consisted of 5% (w/v) cow dung slurry in single strength nutrient broth, thus making it Biocathode MDC. Fresh cow dung weighing approximately

Fig. 1 Diagram of microbial desalination cell unit. AEM anion exchange membrane, CEM cation exchange membrane



700 g was gathered straight from a local dairy farm and left to dry for 3 days at room temperature in an open container. The top stiff layer of cow manure was removed after 3 days. A 5% (w/v) cow dung slurry was prepared using autoclaved distilled water (Yogamoorthi et al. 2018).

Setups 1 and 2 were utilized to treat simulated saline water generated with 5 g/L NaCl first, and the best of the two MDCs in terms of desalination was then used to treat domestic R.O. reject water, which was MDC setup 2 in this study. All MDCs were operated in batch mode for 31 days at 30 °C with the same external load range (820 kΩ to 100 Ω) and matching electrode surface area of 31 cm² and 28.27 cm² ion exchange membrane cross section. Prior to inoculation, the cell was sterilized by autoclaving (15psi, 121 °C for 20 min) in a sealed box and then dipping each component for 10 min in a sterile 90% w/w ethanol/water solution in a laminar air flow cabinet with UV light on, followed by drying on components in the same laminar air flow cabinet with UV light on for another 20 min to ensure ethanol evaporation and a sterile surface environment inside the device upon assembly as somewhat similar to a previously described start-up approach, as employed by Borjas et al. 2017, was followed for all MDC configurations under examination (Borjas et al. 2017). The nutrient broth simulated saline water and RO Reject water solutions used in the MDCs were firstly sterilized using an autoclave at 15psi, 121 °C for 20 min. The cation and anion exchange membranes were washed in sterile 0.5 M NaCl solution and stored in autoclaved distilled water for 24 h at 25 °C to remove any surface additives and then placed with the stabilizing spacers between the respective chambers and then the MDC was sealed in laminar air flow cabinet. The anolyte, a pure culture of *Bacillus velenzeus* (strain AD1-ELB) (2 ml of exponential-phase culture with OD 600 nm = 1), was inoculated into the anode compartment for MDC setups 1 and 2. In MDC setup 1, 100 mL of K₃Fe(CN)₆ sterile solution of 100 mM concentration was utilized as catholyte, and in MDC setup 2, a solution of 5% (w/v) cow dung slurry in single strength nutritional broth was used as catholyte. After assembling the electrodes in both anode and cathode chambers and their respective solutions, the MDC with a vacant middle desalination chamber was kept in a BOD incubator for 3 days at 30 °C enabling microorganisms to grow on the electrode surface (graphite sheet). After incubation, the water samples were introduced into the middle desalination chamber. Once the bioanode and biocathode became stable showing the least variation in current output, the desalination cycle was initiated by replacing the sample in the middle desalination cell with fresh solutions. The desalination cycles were concluded when the conductivity of the saline reservoir was less than 1000 μS/cm, since this value was regarded to be the optimal value for water quality (Council Directive 75/440/EEC 2019; Li et al. 2019).

Electrochemical calculations

The open circuit voltage was recorded by a hand-held digital multi-meter (Haoyue DT830, India) at the regular time interval of every 24 h for a duration of 31 days.

Current (I) was calculated using ohm's law as a ratio of cell voltage (V) to resistance (R) across the different resistors in the 820 kΩ to 100 Ω range:

$$I = V/R.$$

Power (P) was calculated as the product of cell voltage and current:

$$P = V \times I.$$

Further, current (j) and power (p) density were calculated by dividing with the surface area of the electrode (A_{es}) (Sonu et al. 2020).

$$j = \frac{I}{A_{es}}$$

$$p = \frac{P}{A_{es}}.$$

Salt removal percent, $SR\%$, refers to the percentage of NaCl depleted for each desalination cycle, expressed as follows:

$$SR\% = \frac{c_i - c_f}{c_i}$$

where c_i and c_f indicate the salt's initial and final molar concentrations in the desalination chamber (mol/m³), respectively (Ramírez-Moreno et al. 2019).

Change in COD for electrolyte in desalination chamber (COD%) is expressed as follows:

$$COD\% = \frac{COD_f - COD_i}{COD_i}$$

where COD_f is the final COD value and COD_i is the initial COD value.

Analytical methods

Electric conductivity and pH measurements were carried out using an HQ11D conductivity meter (HACH) with micro-probes for pH and conductivity measurements (Ibrahim et al. 2019). Both measurements were recorded at 25 °C. For total COD determination, 5 mL of sample were collected and kept at 4 °C until the COD was determined using the dichromate reflux technique, which involved adding a specified amount of oxidant to the sample and afterward boiling the mixture

for 20 min till the sample was digested. The oxidant oxidizes the COD of the sample in this stage. The initial concentration of organic species may be estimated after a particular duration of oxidation by calculating the quantity of the remaining oxidizing agent. The sample was then refluxed for 2 h in a strong acid solution containing a known quantity of potassium dichromate ($K_2Cr_2O_7$) in the presence of an $Ag_2SO_4/HgSO_4$ combination, which converted chromium (VI) to chromium (III) during oxidation. The quantities of oxidant were calculated using an ultraviolet/visible spectrophotometer at 670 nm (Zendehdel et al. 2022). Chemical characterization of domestic R.O. rejects water was done at Jagdamba Laboratories, Bagru, Jaipur, for parameters like concentration of calcium, magnesium, chloride, sulfate, sodium, potassium, and phosphate using titration methods as standardized in IS 10500:2012 and IS:3025 for drinking water provided by government of India. The flame photometric analysis and inductively coupled plasma mass spectrometry (ICP-MS) analysis were done by sending samples to CEG test house, Malviya Nagar, Jaipur.

Field emission scanning electron microscopy imaging (FESEM)

FESEM imaging was performed to determine the surface morphology of the graphite electrode (Anode). About 1cm^2 size sections of the graphite anode were cut before and after 31 days of MDC operation. Only the section after 31 days of MDC operation was rinsed twice with 0.01 mol L^{-1} PBS buffer (pH 7.4). The sections were then dehydrated in a graded series of ethanol 50% and 100% for 20 min before being dried overnight in a desiccator and the electrode section before MDC initiation was used directly. The sections were coated with gold before imaging on a JEOL JSM-6480LV Scanning Electron Microscope (acceleration voltage 6 kV, HV-mode, SEI detector) (Mansoorian et al. 2020).

Results and discussion

Both MDC setups 1 and 2 (i.e., Ferricyanide redox and Biocathode with simulated saline water) were compared at laboratory scale. Experiments were carried out using simulated saline water ($\text{NaCl } 5\text{ g/L}$) with an initial electric conductivity of $9010\text{ }\mu\text{S/cm}$ (Fig. 4a). Furthermore, the MDC setup 2 was more efficient in salt removal, which was used to treat domestic R.O. reject water with an initial electric conductivity of $6390\text{ }\mu\text{S/cm}$ (Fig. 6a).

Simulated saline water desalination

Maximum power density of 0.212 and $0.221\text{ }\mu\text{W/cm}^2$ and, the maximum current density of 3.117 and $3.291\text{ }\mu\text{A/cm}^2$

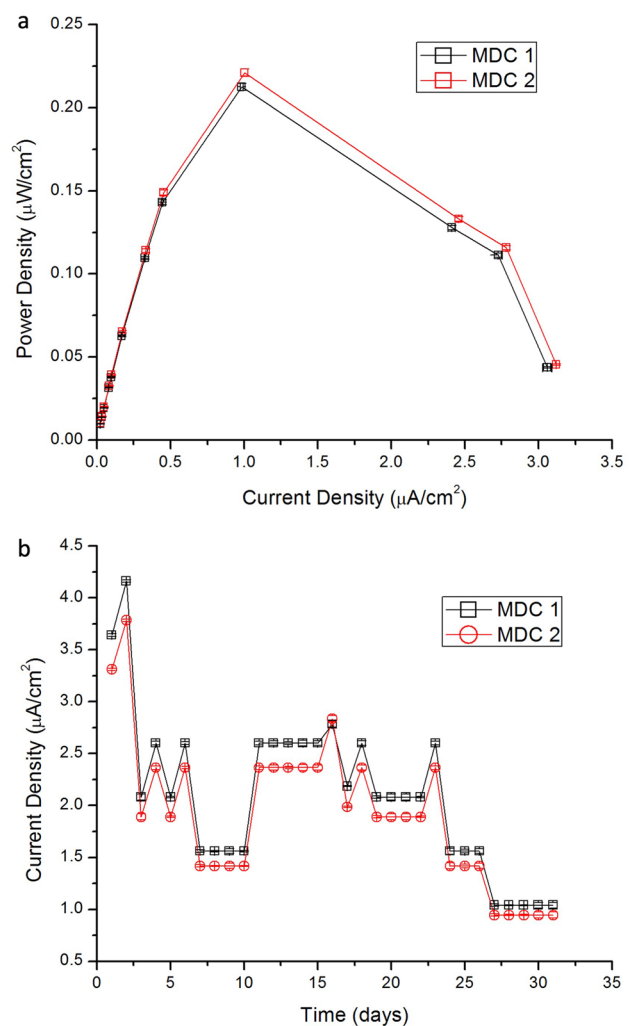


Fig. 2 a Power density ($\mu\text{W/cm}^2$) vs current density ($\mu\text{A/cm}^2$) and b current density ($\mu\text{A/cm}^2$) vs time (days) observed in MDC setups 1 and 2

were recorded in MDC setups 1 and 2, respectively (Fig. 2a, b). This was recorded after operating the MDC for 31 days. The MDC setup 2 (biocathode) showed an increase of 5.6% and 4.2% in current and power density, respectively, when compared with MDC setup 1 (ferricyanide redox) and this is because of the lack of oxygen (batch reactor MDC), molecules like nitrates, manganese, carbon dioxide, and others operate as electron acceptors. With the exception of their role as electron mediators in anaerobic environments, they have similar, if not superior, metabolic activity to that of oxygen (He and Angenent 2006). Moreover, cow dung is rich in nitrogen and manganese-based compounds, as well as various organic matter (Randhawa and Kullar 2011), thus providing alternatives for terminal electron acceptors other than oxygen at the cathode. Therefore, anaerobic biocathode inhibits the back-diffusion of oxygen through the selective ion exchange membrane, preventing electron loss (He and

Angenent 2006), and thus improve the performance of the microbial desalination cell when compared to the ferrocyanide-redox approach. All of this has a direct relationship with the mixed culture of microorganisms in the cow dung slurry, which aids in the cathode reactions providing greater ability to run the desalination process (Jatoi et al. 2022).

However, the range of current densities observed during desalination in MDC systems using the ferricyanide reduction reaction demonstrated less potential than expected, owing to the reaction's slow kinetics, which is common in microbial fuel cell-based desalination systems at neutral pH and increases methane generation while slowing electron release, reducing MFCs overall power density range. With a higher pH of 8.0 and above, the efficiency of methanogenic microbes is reduced, and electrons are released to aid in the oxidation of the substrate (Singh et al. 2019). Despite the reduced thermodynamic potential in the cathode compartment when biocathode reduction is utilized, the increase in MDC kinetics gives greater accessible potential in MDC systems due to the presence of mixed culture and alternative electron acceptors other than oxygen in the cathode chamber (He and Angenent 2006; Randhawa and Kullar 2011). In retrospect, compared to the ferricyanide reduction approach, the mixed culture of microorganisms in the cow dung slurry or Biocathode can provide rapid MDC kinetics with help of a biofilm formation on the graphite electrode. The build-up of sodium ions on the graphite electrodes in a dynamically adsorbed initial layer produces an effective positive surface charge density, which is charge-balanced by the accumulation of chloride ions on the other electrode after passing through the selectively permeable membranes, respectively (Finney et al. 2021). The concentration of ions falls exponentially at the lowest overall electrolyte concentrations, with the layer thickness diminishing with increasing concentration (Finney et al. 2021). As the NaCl concentrations increase, overlapping layers of cations and anions start developing before the net surface charge is neutralized on the electrode, resulting in the stable biofilm formation and

rise in MDC kinetics for biocathode assembly (Finney et al. 2021).

The AD1-ELB bacterial strain was strongly adhered to the surface of the electrode after 31 days of MDC inoculation, as observed by FESEM imaging (Fig. 3a, b). Bacteria adhering to the anode have a uniform, consistent morphology. The bacteria's biofilm formation over the 31-day trial period may serve as biocatalysts in electron transfer to the anode. In a recent study (Dongre et al. 2022), three-minute exposure of low-frequency ultrasonic treatment to AD1-ELB strain resulted in a maximum power density of $4.33 \mu\text{W}/\text{cm}^2$ and a current density of $51.78 \mu\text{A}/\text{cm}^2$ in the MFC, which declined after four or five minutes of exposure. It further demonstrated stabilization of OCV after the sixteenth day of inoculation. This is because the microbial cell adherence to a stable electrode surface is improved by biofilm formation. Under these circumstances, the carbon in the graphite support becomes positively charged, promoting the strong attachment of negatively charged bacteria. According to the literature, whenever the biofilm is developed using applied potential, the MFC start-up time is reduced when compared to the identical MFC where the biofilm was generated without polarization (Marcílio et al. 2021).

The electric conductivity for simulated saline water desalination under the mentioned experimental conditions is depicted in Fig. 4a (setups 1 and 2). Since electric current is also linked to ion species movement, the Salt Removal rate (i.e., percentage of NaCl removed from the desalination chamber for each desalination cycle) for the Biocathode MDC was 83% and for ferrocyanide-redox, MDC was 78% making Biocathode MDC more effective desalination assembly (Table 1).

The current density in MDC setup 1 decreased from $4.16 \mu\text{A}/\text{cm}^2$ (on day 2) to $1.03 \mu\text{A}/\text{cm}^2$ in 31 days (Fig. 2b). This reduction might be due to a fall in the conductivity of the desalination compartment from 9010 to $1000 \mu\text{S}/\text{cm}$ (Fig. 4a). In the case of the MDC setup 2 (biocathode), the current density dropped from 3.78 to $0.94 \mu\text{A}/\text{cm}^2$ in 31 days

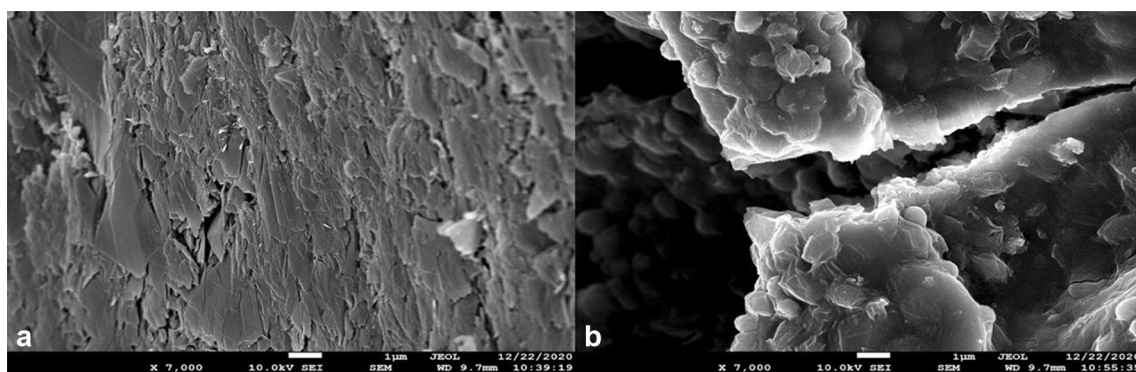


Fig. 3 FESEM image of graphite anode of MDC setup 2 **a** before inoculation and **b** after 30 days of inoculation

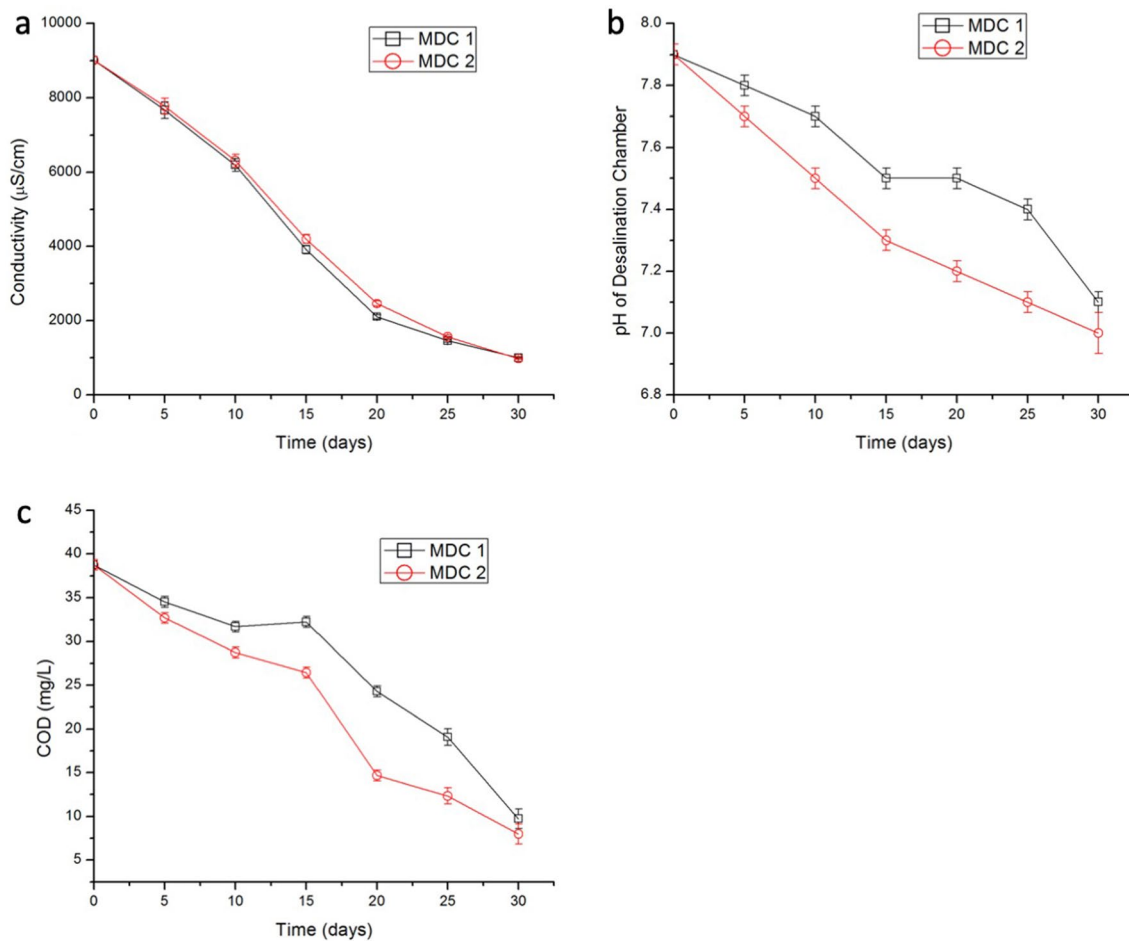


Fig. 4 Change in conductivity (a), pH (b), and COD (c) of electrolyte in desalination chamber of MDC setups 1 and 2 during 30 days of incubation

Table 1 Salt removal percent for MDC setups 1 and 2

Setup	Concentration of NaCl (initial) g/mL	Concentration of NaCl (final) g/mL	Salt removal %
MDC 1	5	1.1 ± 0.1	78 ± 2
MDC 2	5	0.85 ± 0.01	83.1 ± 0.1

(Fig. 2b), as a drop in the conductivity in the desalination compartment from 9010 to 967 µS/cm was also recorded (Fig. 4a). But since electric conductivity decreased during the trials, the drop in current density in both MDCs could be attributed to an increase in the MDC's internal resistance and substrate consumption in the electrode chambers, as well as a decrease in ion concentration in the desalination chamber acting as a salt bridge. These findings are consistent with earlier MDC behavior while operating in batch mode (Borjas et al. 2017). The salt removal rate for all desalination cycles surpassed 70%, showing that both MDCs function well as desalination devices. The pH value of the electrolyte in the

desalination chamber for setups 1 and 2 remained between pH 7.9–7.1, respectively, and never fall in an acidic range (Fig. 4b).

In terms of wastewater treatment, MDC setups 1 and 2 treated simulated saline water removed 74.9% and 79.5% of COD of the electrolyte in the desalination chamber, respectively (Fig. 4c). This COD reduction in the desalination chamber provides the ions that generate electric current and drives the desalination process (Koomson et al. 2021). This observation indicates that it is possible to generate electricity while desalinating water and treating wastewater (Carmalin Sophia et al. 2016; Sevda and Abu-Reesh 2018). These results also suggest that desalination was largely due to electricity production by microbes also with the possibility of dilution resulting from water osmosis from the less concentrated anode and cathode chambers into the desalination chamber. A similar observation of the dilution effect due to the concentration gradient was reported by Mehanna et al. (2010a, b) (Mehanna et al. 2010b). Also, the large inter-membrane distance of 3.5 cm of the MDC in this study,

possibly contributed to the dilution effect observed (Abubakari et al. 2019). Earlier research by Ping and He (2013) indicated that longer inter-membrane distances promoted water osmosis into desalination chambers (Ping and He 2013; Ping et al. 2013).

Domestic RO reject water desalination

It was evident from the chemical characterization of domestic R.O. reject water contained a variety of ions and salts (Table 2). This domestic R.O. rejects water was treated in MDC setup 2 and demonstrated higher salt removal when compared with simulated saline water treatment (MDC setups 1 and 2) containing only NaCl salt. In MDC setup 2 treating domestic R.O. reject water, it achieved a maximum power density of $0.337 \mu\text{W}/\text{cm}^2$ (Fig. 5a) and the current density decreased from $4.63 \mu\text{A}/\text{cm}^2$ (at day 2) to $1.15 \mu\text{A}/\text{cm}^2$ in 31 days (Fig. 5b). This was in accordance with a 78.3% drop in conductivity in the desalination chamber of MDC setup 2 treating domestic RO reject water (Fig. 6a). This is because different direct or mediated electron transfer mechanisms may occur at the biocathode surface at the same time, based on bacterial membrane proteins and cytochrome molecules with lower redox potential, as well as some metabolic end products that can be oxidized at the electrode surface, acting as mediators for electron transfer (Ebrahimi et al. 2018). All of this is possible in the biocathode because it contains a community of mixed bacteria metabolizing various organic substrates (cow dung slurry) that operate together as one (Randhawa and Kullar 2011).

It is important to note that for MDC setups 1 and 2, the salt removal was around 75%, indicating promising directives when compared to the partial desalination as previously reported with respect to the cathode reaction of about 50% salt removal (Zhang and He 2015; Moruno et al. 2018).

Table 2 Chemical characteristics of domestic RO reject water used in desalination chamber of setup 2

S no.	Properties	Range
1	Turbidity	Nil
2	pH	8.23
3	Total dissolved solids (mg/L)	12,660
4	Electrical conductivity ($\mu\text{S}/\text{cm}$)	6390
5	Calcium (mg/L)	824.18
6	Magnesium (mg/L)	214.70
7	Chloride (mg/L)	2824.65
8	Sulfate (mg/L)	1130.80
9	Sodium (mg/L)	1890.40
10	Potassium (mg/L)	850.70
11	Phosphate (mg/L)	4.66
12	Chemical oxygen demand (COD)	43.82

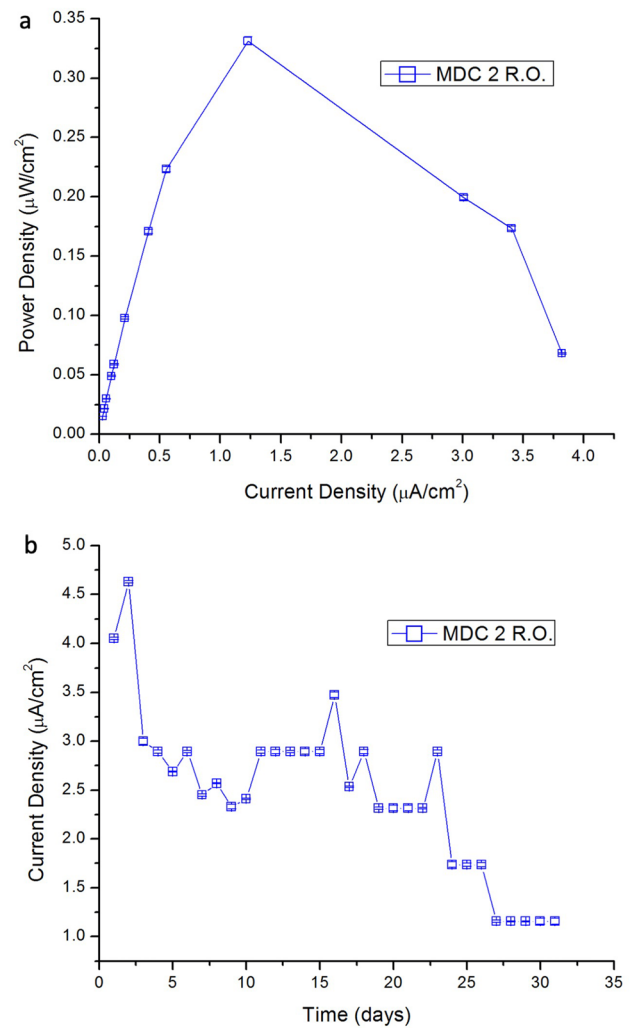


Fig. 5 a Power density ($\mu\text{W}/\text{cm}^2$) vs current density ($\mu\text{A}/\text{cm}^2$) and b current density ($\mu\text{A}/\text{cm}^2$) vs time (days) observed in MDC setup 2 using domestic RO reject water

This result might be linked to the high available potential for driving ion migration, which is aided by the selective ion exchange membranes utilized in both MDC setups, which assist in successful ion transfer. Ion back-diffusion transit became a significant constraint, which was mitigated by the buffering capability of domestic R.O. reject water (Ebrahimi et al. 2018). As a result, the desalination chamber showed a zero net salinity balance (Ping et al. 2016; Xie et al. 2021; Yang et al. 2021). The presence of the desalination chamber between the anode and cathode chambers, as well as the buffering capability of the Domestic R.O., reject water due to the diversity of ions and salts already present in it, reducing the inhibitory impact of oxygen diffusion in the anode chamber (Ebrahimi et al. 2018). This impact is seen in Figs. 6a and 4a as an asymptotic trend of conductivity with pH between 8 and 7 for all MDC configurations (Figs. 6b and 4b). The COD reduction percentage increases

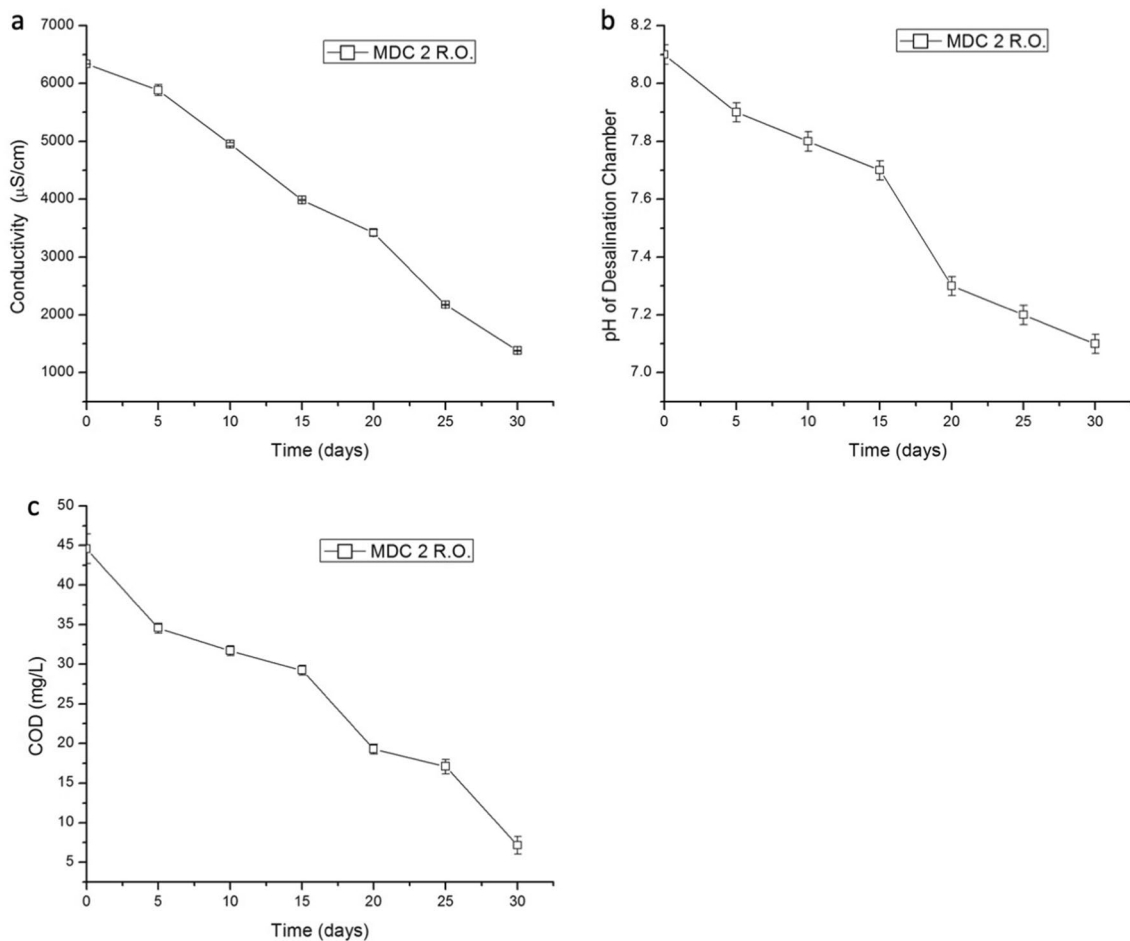


Fig. 6 Change in conductivity (a), pH (b), and COD (c) of electrolyte in desalination chamber of MDC setup 2 using domestic RO reject water during 30 days of incubation

in proportion with the sodium chloride content (Mohamed et al. 2016), and is related to the fact that the higher the chloride ion concentration, the greater the capacity of chloride ions to eliminate any passive oxidizing components that tend to collect on or around the anode, limiting anode dissolving and increasing desalination of the microbial desalination cell (Mohamed et al. 2016).

In the case of domestic RO reject water treatment, the concentration of sodium ions reduced from 1760 to 352 mg/L, potassium ions reduced from 825 to 187 mg/L, and calcium ions reduced from 817 to 220 mg/L resulting in a percent reduction of 79, 77, and 73%, respectively, during 31 days. Flame photometry (Fig. 7a) and ICP-MS (Fig. 7b) analysis revealed nearly identical ion concentrations. COD removal (84%) (Fig. 6c) and average desalination percentage of Na, K, and Ca ions (76%) for domestic RO reject water treatment yields a favorable outcome due to the provision of a buffering zone (desalination chamber) in the midst of both electrode chambers, as well as the buffering capability of the domestic RO reject water (Mohamed et al. 2016; Ebrahimi

et al. 2018). This will improve the overall performance of the microbial desalination cell including the assistance of a consortium of microorganisms with several electron transfer mechanisms operating at the same time (Ebrahimi et al. 2018).

Simulated saline water desalination is simple in terms of real-world application as it only contains sodium and chlorine ions. In the case of domestic R.O. reject water desalination, MDC setup 2 (biocathode approach) may accomplish optimum desalination, since the reject water may include a wide range of ions and the mixed culture of cow dung slurry can subsequently use it. In a similar study, Yogamoorthi et al. (2018), discusses the prospect of sustainable generation of electricity, which could be attributed to two factors: first, the quality of cow dung used as a substrate; and second, the concentration of potassium permanganate solution (2%) used as catholyte in their study (Yogamoorthi et al. 2018). Regarding the quality of the cow dung utilized in the present study, fresh cow dung was pre-processed before being placed in the MFC with a cow dung slurry at 5% (w/v) with water.

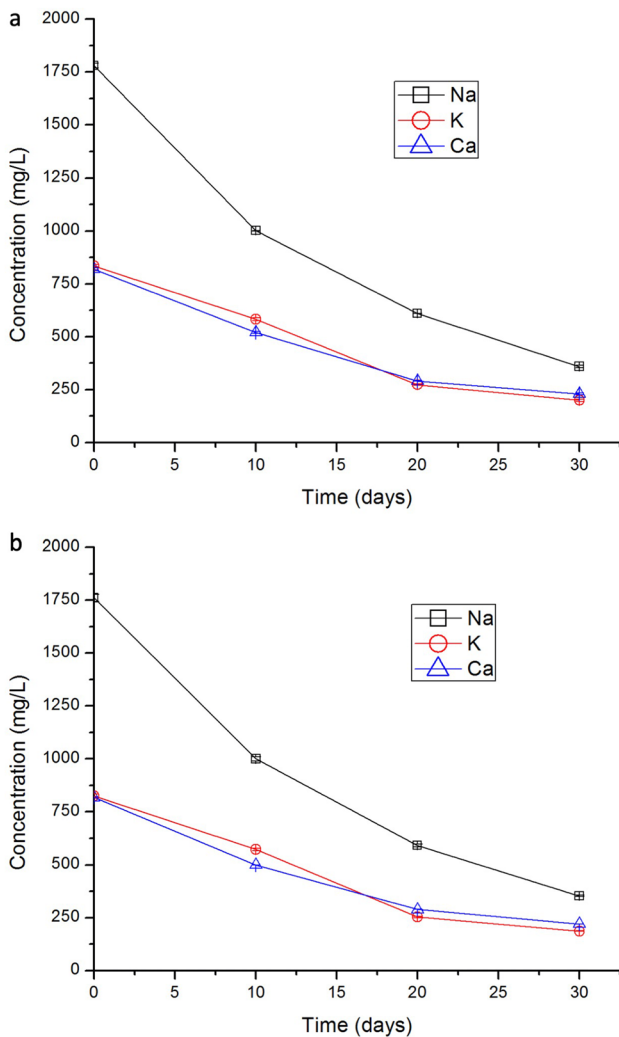


Fig. 7 Change in the concentrations of Na, K, and Ca in desalination chamber of setup 2 with domestic RO reject water during 30 days of incubation as analyzed by **a** flame photometry and **b** ICP-MS

The cow dung once collected from the site was left at room temperature in an open container for 3 days for hardening the surface layer, which aided in the formation of an anaerobic environment underneath the top layer. The pre-processing of fresh cow dung stimulated the development of the microbial population in the cow dung (Yogamoorthi et al. 2018). Because it was a microclimate in an acidic medium, it could only sustain a certain type of microorganism, and those bacteria would live and thrive to consume the organics in the cow dung.

According to Abubakari et al. (2019), their MDC obtained a maximum COD reduction of 49%, perhaps owing to fermentation and methanogenesis. Furthermore, other electron acceptors like nitrates and oxygen have contributed to the poorly observed Coulombic efficiency. In a typical batch cycle of their study, the MDC removed 1.07%

of the nitrate. The elimination of nitrate was attributed to heterotrophic denitrifying bacteria. Phosphorus removal of 9.97%, on the other hand was observed, which was connected with the activities of polyphosphate accumulating bacteria (Abubakari et al. 2019). As a result, phosphorus reduction may have happened early in the experiment before anaerobic conditions were established in their setup. When they purged analytes with nitrogen gas prior to experimental commencement, the formation of anaerobic conditions was delayed. Thus, cow dung base microbes are able to utilize a variety of ions when used in MDC setup.

Furthermore, because cow dung slurry is inexpensive, if Biocathode MDC shows an increased rate of salt removal and energy production in the MDC device, it can be inexpensively replenished when exhausted. As discussed earlier, most MDCs have significant reagent and material costs. Thus, low-cost and effective techniques for regeneration of the redox mediator catholyte, such as exploiting novel sources of electrogenic microorganisms, must be investigated in future studies (Liang et al. 2009).

Conclusion

Microbial desalination cell combines microbial fuel cells with electro dialysis in a singular design to create freshwater at a minimal energy expenditure and furthermore, MDC provides current and power density with the use of treated wastewater. We were able to evaluate the desalination performance of both systems and identify the significant technological restrictions while treating simulated saline water and domestic R.O. reject water using two identical MDC experimental setups with different cathode approaches (ferricyanide redox and biocathode). Even though the salt removal rate and COD reduction rate increased by 5.0% and 4.6%, respectively, which is one order of magnitude higher than those produced using a ferricyanide redox method, the biocathode approach outperforms ferricyanide redox in simulated saline water, increasing the desalination rate from 78 to 83% and the COD reduction rate from 74.9 to 79.5%, respectively, with an average 5% increase in current and power density. When setup 2 (biocathode) was used for domestic RO reject water, maximum current and power density of $3.81 \mu\text{A}/\text{cm}^2$ and $0.337 \mu\text{W}/\text{cm}^2$ were recorded, with a desalination and COD reduction of 76% and 83.9%, respectively. The study establishes the practicality of MDC technology, as well as its limitations, benefits, and downsides when applied in a real-world setting. Catholyte regeneration methods are being investigated further in order to reduce costs and allow low-cost and successful desalination utilizing cow dung slurry. A trade-off between MDC performance and costs may be addressed for future upscaling and application in actual circumstances. As a result, the findings

of this study will help to enhance MDC technology and scale it up for usage in real-world circumstances, with a focus on novel sources of electrogenic bacteria.

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Author contributions AD wrote and interpreted the data of the manuscript; MS contributed in the conception of the work; RS and NKP edited the final version of the manuscript. All the author(s) read and approved the final manuscript.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human or animal subjects performed by any of the authors. Therefore, it is not applicable here.

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on
**Sustainable Development Techniques
of Water and Environment
(SDTWE-2022)**

Organized by

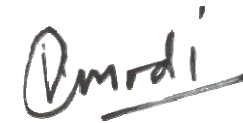
Kautilya Institute of Technology & Engineering
Certificate of Appreciation

Ref. No.: KITE/2021-22

*This is to certify that **Prof. (Dr.) Meena Kumari Sharma, Professor & HOD, Manipal University, Jaipur** has delivered a keynote speech on the title of “**Sustainable Techniques for Wastewater Management in Non Sewered Areas**” in the Faculty Development Programme on “**Sustainable Development Techniques of Water and Environment**” (SDTWE-2022) organized by **Kautilya Institute of Technology & Engineering, Jaipur** during March 21st to 25th, 2022.*



Principal
KITE, Jaipur



Convener
SDTWE-2022

Dr. Anil Dutt Vyas,
Manipal University Jaipur,
India.

From:
Prof. D. Brdjanovic, PhD

Subject: Invitation to GSGS Summit in Ahmedabad, India.

Date:
August 22, 2022.

Dear Dr. Anil Dutt Vyas,

It is my pleasure to invite you to the Asian Global Sanitation Graduate School (GSGS) Summit that will take place in Ahmedabad, India, from 1-3 November, 2022.

The Summit will focus on the present and the future of the GSGS in Asia with particular focus on sustainability of the GSGS program at your university, update of the program, and communication, co-operation and networking. A detailed program will be shared with you soon.

Another objective of the Summit is to generate interest and commitment of other academic institutions across Asia and to make plans for the future of GSGS in this continent.

You are expected to arrive in Ahmedabad on Monday, October 31, 2022, and to depart on Friday, November 4, 2022. IHE Delft administration will arrange and pay an air ticket for you. What you need to do is to, as soon as possible, confirm the flight itinerary suggested on the GSGS Telegram Channel or propose your desired schedule for your flight from your home base to Ahmedabad and back. We shall also need a copy of your valid passport featuring your photo and personal details in order to purchase your economy class ticket. Your passport data will be used only for the purchase of tickets through our network of travel agencies. The ticket will be sent to you by our travel officer via email. The travel arrangements from your home to the airport and back is your responsibility, but the costs will be reimbursed to you based on the proof of purchase of transportation. Please note that we shall prepare a declaration form for the reimbursement that you will need to send to us after your return home, signed and with your bank account details. Upon your return home, please send a single PDF file with the signed declaration form and all the proofs of the costs incurred, to Ms. Nnamaka Ojogbo (n.ojogbo@un-ihe.org), the GSGS admin assistant. We shall make a reimbursement to you soon after we receive your proofs via bank transfer.

You are responsible for checking and, if required, obtaining the visa to enter Ahmedabad in time. The costs for your visa will be reimbursed by IHE Delft based on the proof of purchase. You may wish to use this letter to obtain the visa, if needed.

Please, observe the entry regulations concerning the COVID check requirements. Also, the costs for your COVID test will be reimbursed by IHE Delft based on the proof of purchase, if needed. Do not underestimate the time that it may take to obtain all the necessary entry requirements, so please plan ahead of time and prepare accordingly.

You may also be required to do a COVID check on departure. We shall investigate if we can organise this for you sometime on Thursday, November 3, 2022, and if possible, in the hotel where you stay. The Summit will also take place in the same hotel (except for the opening ceremony which will take place at CEPT University). At the moment we are identifying the appropriate hotel for our stay and the event.

It is very likely that we shall arrange pick-up services for you from the airport to the hotel and back. If not, you need to take care of that by yourself and we shall reimburse you for the incurred transportation costs based on the proof of purchase.

Breakfasts and lunches will be arranged for you in the hotel, where we will secure a room for you for four nights, Monday night till Thursday night, with departure on Friday. IHE Delft will cover the costs of hotel, breakfasts and lunches in the hotel. For dinners (at location of your choice) we shall make an allowance according to IHE Delft regulations for Ahmedabad. Dinners will be reimbursed individually via the expense claim form mentioned earlier, based on the proofs and within the allowance which will be communicated to you in time. So, you will need to pay for your dinner yourself and we shall reimburse you later for it.

In case you wish to arrive earlier (before Monday, October 31) and/or depart later (after Friday, November 4), please inform us about that. However, the hotel and other staying costs for these extra days must be covered by you. In case there are no available flights for you to arrive in Ahmedabad on Monday, October 31, and you need to arrive a day earlier, we shall cover the additional hotel overnight stay. The same is also applicable in a case where there are no flights to return to your home on Friday, November 4, and so you need to depart a day later. Seeing that we have a limited budget for this Summit, we hope that you will be able to find a flight that will bring you to Ahmedabad and back home at our preferred schedule.


The person to send your preferred travel schedule and copy of the passport is Ms. Nnamaka Ojogbo (n.ojogbo@un-ihe.org), the GSGS admin assistant.

In terms of preparation, we shall inform you timely about the Summit agenda and what we expect from you before, during and after the Summit.

Our partner, CEPT University, has formed a great support team and will be assisting us in the organization and implementation of this Summit.

So, for the time being, that is all from us. Looking forward to seeing you in Ahmedabad soon.

Best regards,



Prof. Dr. Damir Brdjanovic
Professor of Sanitary Engineering
Director Global Sanitation Graduate School

To

Dr. A. D. Vyas

Deputy Director Students Welfare,

Manipal University Jaipur

Date: 14 March 2022

Subject: Invitation to deliver an offline expert session to the Environmental and Civil Engineering students and faculty members at Marwadi University, Rajkot, Gujarat

Respected Sir

Namaste!

This is to cordially invite you to deliver an expert session on “*Water & Sanitation, Faecal Sludge Management, Urban water conveyance planning, and management*” to the students of the environmental engineering and civil engineering programs. The session has been organized in two parts on 25 March and 26 March 2022 at the university campus to make it effective for the learners.

During your visit, we have planned to demonstrate a few best practices regarding the green campus initiatives and we are eager to receive your valuable inputs for the advancement and strengthening of the same.

It will be a privilege and pleasure to have you with us.

We are looking forward to your support and consent for the invitation.

We are sure that it will be a great learning and knowledge-sharing session for all the students and faculty members.

Thank you

Yours sincerely



Dr Ankur Bhogayata

Head of CED-FOE, Marwadi University ,
+919427431112



SCHOOL OF WATER AND WASTE



ANIL AGARWAL ENVIRONMENT TRAINING INSTITUTE
(A Unit of Centre for Science and Environment)

CERTIFICATE OF PARTICIPATION

Advanced Training Programme on Decentralised Wastewater Management and Local Reuse

This is to certify that SAGAR GUPTA has participated in the advanced residential training programme on “**Decentralised Wastewater Management and Local Reuse**” organised by the School of Water and Waste, Centre for Science and Environment (CSE), New Delhi from **May 10 - 13, 2022** at Anil Agarwal Environment Training Institute (AAETI), Nimli, Rajasthan.

With best wishes,

A handwritten signature in blue ink, appearing to read 'D. S. Kapur'.

Depinder Singh Kapur
Director – Water Programme
Centre for Science and Environment

A REPORT ON
INDUSTRY EXPERT SEMINAR
ON
WATER SECURITY AND SUSTAINABLE INFRASTRUCTURE

Even Organizer

Dr. Mohammad Parwez Akhtar, Associate Professor
Department of Civil Engineering
School of Civil & Chemical Engineering Manipal University

Department of Civil Engineering in collaboration with Directorate of E Cell organized an offline seminar under industry expert lecture series to foster the entrepreneurship mindset among civil engineering students of Manipal University Jaipur on 8th November 2022 at Room No. 307, AB1 Maipal University Jaipur, Jaipur (Raj.)

On 8th November 2022, (at Room No. 307 AB1, MUJ), the industry guest lecture was organized in physical mode by the Civil Engineering Department, Manipal University Jaipur. The esteemed Guest of the event was (Guest Speaker: Dr. Harinarain Tiwari, Managing Director, Floodkon Consultants LLP Noida India. The objective of the industry expert lecture was to acquaint the students about the importance of professional career building with adequate exposure on sustainable approach on water security and infrastructural development with specific focus on undermentioned thrust areas but not restricted to,

1. To learn the practical concepts, technicalities and to equip with the procedures for major engineering project
2. To provide a platform for students to discuss with industry expert for further career development.
3. To do formal MoU between Manipal University Jaipur and Floodkon LLP.
4. To create opportunities such as internships, minor and major projects, training and job placement, and research for students and faculties.
5. To build networking for counseling in future curriculum development.

More than 60 student/faculty members participants attended this physical event.

On this occasion, Prof. (Dr.) Bhawna Tripathi, Director SCCE and Dr. Meena Kumari Sharma, Head of the Department welcomed Dr. Harinarain Tiwari and encouraged attending students to ask their queries with the esteemed after his discussion. Dr. M. Parwez Akhtar formally introduced Dr. Harinarain Tiwari (Managing Director, Floodkon Consultants LLP Noida India) with brief discussion on Dr. Tiwari's credentials and achievement and experience. After his very fruitful speech and discussion with attendees, Dr. Tiwari expressed his gratitude for the august gathering.

The vote of thanks was expressed by Dr. Meena Kumari Sharma. The entire event was smoothly conducted by a PhD Scholar. Ms. Shweta Kodihal.

Esteemed dignitaries and attending faculty members heaped praise for the successful organization of the event that would boost the morale of the participating students and shared the knowledge on the topic of “Water security and sustainable infrastructure”.

Images



Figure 1: Attendees in the seminar at Room No 307 AB1 during the lecture



Figure 2: Dr. Harinarayan Tiwari delivering his lecture

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Figure 3: Dr. Harinarayan Tiwari interacting to Civil Engineering students



Figure 4: Attendees listening to Dr. Harinarayan Tiwari

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Figure 5: Esteemed guest signing an MoU with MUJ jointly managed by E-Cell and Department of Civil Engineering



Figure 6: Visit of the esteemed guest the Registrar MUJ for MoU signing ceremony with MUJ jointly managed by E-Cell and Department of Civil Engineering

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Circulation Email from MUJ Exchadmin to MUJ Faculty community for the event announcement

Invitation for Industry Expert Lecture_ - Dr. Harinarayan Tiwari on 8th November 2022 from 12.15 PM to 2.00 PM

Exchadmin [MU - Jaipur] <exchadmin@jaipur.manipal.edu>

Mon 07-11-2022 14:13

To: MUJ Faculty <muj.faculty@jaipur.manipal.edu>

Dear All

Greetings!!!

The Department of Civil Engineering, Manipal University Jaipur cordially invite you to the **Industry Expert lecture**, on 8th November 2022. The Lecture will be delivered by **Dr. Harinarayan Tiwari, Managing Director, FLOODKON CONSULTANTS LLP, Delhi, India** on a very interesting topic with global significance on "Water Security and Sustainable Infrastructure".

Faculty members and students who all are interested in the domain of Water and sustainable Infrastructure, please join the lecture.

Time: 12:15 PM – 2:00 PM

Venue: 307, Academic Block 1

The poster features the Manipal University Jaipur logo at the top left and an A+ NAAC accreditation badge at the top right. The main title is "INDUSTRY EXPERT LECTURES" followed by "WATER SECURITY AND SUSTAINABLE INFRASTRUCTURE". A photograph of Dr. Harinarayan Tiwari is shown in the lower left. The event details are listed on the right: "WHEN: November 8th, 2022, 12.15 pm - 2.00 pm", "WHERE: ROOM NO : 307, Academic Block-1 Manipal University, Jaipur", "COORDINATOR: DR. PARWEZ AKHTAR, ASSOCIATE PROFESSOR, DEPT OF CIVIL ENGINEERING, ECCEI MANIPAL UNIVERSITY, JAIPUR", and "ORGANISED BY: DEPT. OF CIVIL ENGINEERING, MANIPAL UNIVERSITY JAIPUR, JAIPUR-303007".

Regards,
Dr. Parwez Akhtar
Associate Professor (Civil Engineering)
Manipal University Jaipur
Contact: 8235630860



**MANIPAL UNIVERSITY
JAIPUR**

MUJ/Q&C/22/F/1.01



**MANIPAL UNIVERSITY
JAIPUR**

FACULTY OF ARTS

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

DEPARTMENT OF ARTS

Societal Connect "Cleanliness Awareness Drive".

Date of Event : 28/09/2022



1. Introduction of the Event

Department of Arts School of humanities and social science in collaboration with DSW And NCC Air wing Cadets Manipal University Jaipur conducted a cleanliness awareness drive at MUJ Main gate to Gram Panchayat Dehmi Kalan on 28 September It was a physical activity involving the students or NCC Cadets.

2. Objective of the Event (bullet points or about 50 words)

- To spread awareness about cleanliness among villagers.
- To spread awareness about diseases related to a clean environment.
- To reach the shopkeepers and told them not to litter around shop

3. Beneficiaries of the Event

The event was conducted for Manipal university Jaipur students to be aware of social connect activity starting from the MUJ Main gate to Gram Panchayat Dehmi Kalan on 28 September It was a physical activity involving the Students of Department of Arts (SHSS) Manipal University Jaipur, and villagers of Dhemi kalan village

4. Brief Description of the event (about 200 words)

Department of Arts School of humanities and social science in collaboration with DSW And NCC Air wing Cadets Manipal University Jaipur conducted a cleanliness awareness drive at MUJ Main gate to Gram Panchayat Dehmi Kalan on 28 September 2022 It was a physical activity involving the students from Department of Arts (SHSS), NCC cadets, and some volunteers. Providing MUJ students exposure to the society around them through such societal connect activities. The event was inaugurated by Dr. Abhishek Shrivastava Deputy Director of DSW, Prof Richa Arora, Dr. Rina Poonia Deputy Director of Physical Education, and convenor of the event Mr. Mohit Sharma and Sanjeev Sharma NCC officer, Mr. Hemant Kumar NSS Program coordinator and Dr. Shyam Sundar Sharma were present.

5. Photographs



Faculty and students generating awareness about societal cleanliness



All faculty , students and GSWs together during the cleanliness drive



Organisers of the vent with director, SHSS



Students engaged in cleanliness awareness drive

6. Brochure or creative of the event (insert in the document only)



MANIPAL UNIVERSITY
JAIPUR

School of Humanities & Social Sciences
Department of Arts

in collaboration with
Directorate of Student Welfare
is organizing

A Societal Connect Activity
Cleanliness Awareness Drive

28th September, 2022 @ 10:00 am

University Main Gate to Gram Panchayat,
Dehmi Kalan, Jaipur

7. Schedule of the event (insert in the report)

- Started at Manipal University main gate at 10:00 AM
- 1st Stop Bus stop near water tank MUJ at 10:15
- 2nd Stop Govt School Dehmi Kalan
- Ends at Manipal University Main gate with refreshment distribution.

Attendance of the Event

S. no	Name of Institution	Place of Institution	Registration Number	Name of Attendee	Name of Dept
1	Manipal University Jaipur	Jaipur	221106005	ARJUN	Arts
2	Manipal University Jaipur	Jaipur	221106001	UTKARSH SINGH	Arts
3	Manipal University Jaipur	Jaipur	221106003	VAIBHAV VERMA	Arts
4	Manipal University Jaipur	Jaipur	221106004	HARSHIT GAUR	Arts



MANIPAL UNIVERSITY JAIPUR

5	Manipal University Jaipur	Jaipur	221106006	HIMRATNA SINGH RANAWAT	Arts
6	Manipal University Jaipur	Jaipur	221106009	KARNI SINGH SHEKHAWAT	Arts
7	Manipal University Jaipur	Jaipur	201106001	ARYAN BHARGAVA	Arts
8	Manipal University Jaipur	Jaipur	201106011	HIMANSHU KUMAR	Arts
9	Manipal University Jaipur	Jaipur	201106013	PRASHANT KUMAR	Arts
10	Manipal University Jaipur	Jaipur	201106015	DIVYARAJ SINGH RATHORE	Arts
11	Manipal University Jaipur	Jaipur	201106016	DEVENDER	Arts
12	Manipal University Jaipur	Jaipur	201106002	ARYAN GANDHI	Arts
13	Manipal University Jaipur	Jaipur	211106004	LAVANYA RAJAWAT	Arts
14	Manipal University Jaipur	Jaipur	211106005	JAYANT BHATI	Arts
15	Manipal University Jaipur	Jaipur	211106006	ISHAAN YADAV	Arts
16	Manipal University Jaipur	Jaipur	211106007	ASHUTOSH GAUTAM	Arts
17	Manipal University Jaipur	Jaipur	211106015	RISHAB MODI	Arts
18	Manipal University Jaipur	Jaipur	209301181	Akshat Tyagi	B TECH IN COMPUTER SCIENCE & ENGINEERING (CSE)
19	Manipal University Jaipur	Jaipur	209301209	Manas Jha	B TECH IN COMPUTER SCIENCE & ENGINEERING (CSE)
20	Manipal University Jaipur	Jaipur	209205047	Vidhit Shetty	B TECH IN COMPUTER SCIENCE &



MANIPAL UNIVERSITY JAIPUR

					ENGINEERING (CSE)
21	Manipal University Jaipur	Jaipur	209301363	Sarthak Srivastava	B TECH IN COMPUTER SCIENCE & ENGINEERING (CSE)
22	Manipal University Jaipur	Jaipur	209302258	Shreyansh Rai	B TECH IN COMPUTER SCIENCE & ENGINEERING (CSE)
23	Manipal University Jaipur	Jaipur	219311321	Vaibhav Yadav	B TECH IN COMPUTER AND COMMUNICATION ENGINEERING
24	Manipal University Jaipur	Jaipur	209302034	Shubhangam Kumar Mishra	B TECH IN INFORMATION TECHNOLOGY
25	Manipal University Jaipur	Jaipur	RJ/20/SWF/278459	CHETNA KESI	NCC
26	Manipal University Jaipur	Jaipur	RJ/20/SDF/278462	DEEPENDRA RATHORE	NCC
27	Manipal University Jaipur	Jaipur	RJ/20/SDF/278469	PRASHANT KUMAR	NCC
28	Manipal University Jaipur	Jaipur	RJ/21/SWF/2784..	AVANI AHLAWAT	NCC
29	Manipal University Jaipur	Jaipur	RJ/21/SWF/2784..	KHUSHI MORE	NCC
30	Manipal University Jaipur	Jaipur	RJ/21/SWF/2784..	LAVANYA RAJAWAT	NCC
31	Manipal University Jaipur	Jaipur	RJ/20/SWF/2784..	TANYA SINGH THAKUR	NCC
32	Manipal University Jaipur	Jaipur	RJ/21/SDF/2784..	NAJID KHAN	NCC
33	Manipal University Jaipur	Jaipur	RJ/21/SDF/2784..	ANIRUDH SINGH	NCC
34	Manipal University Jaipur	Jaipur	RJ/21/SDF/2784..	ROYAL RAJPUROHIT	NCC
35	Manipal University Jaipur	Jaipur	RJ/21/SDF/2784..	ARYAMAN RATHORE	NCC



MANIPAL UNIVERSITY JAIPUR

36	Manipal University Jaipur	Jaipur	RJ/21/SDF/2784..	DIVYANG TIWARI	NCC
37	Manipal University Jaipur	Jaipur	RJ/21/SDF/2784..	ANKIT YADAV	NCC
38	Manipal University Jaipur	Jaipur	MUJ0492	Dr. Rina Poonia	Arts
39	Manipal University Jaipur	Jaipur	MUJ0619	Dr. Abhishek Shrivastav	Electronics and Communication Engineering
40	Manipal University Jaipur	Jaipur	MUJ0246	Mr. Hemant Kumar	Mechatronics Engineering
41	Manipal University Jaipur	Jaipur	MUJ0981	Mr. Sanjeev Sharma	Sports Officer
42	Manipal University Jaipur	Jaipur	MUJ1224	Mr. Mohit Sharma	Arts

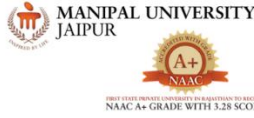


8. Link of MUJ website stating the event is uploaded on website

<https://jaipur.manipal.edu/muj/news-events/events-list/cleanliness-awareness-drive.html>

Dr. Mani Sachdev
Head, Department of Arts
Manipal University Jaipur

Seal and Signature of HOD



April 27, 2022
Wednesday
10:00 AM- 12:00 PM



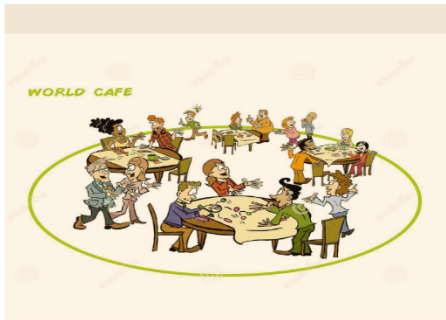
Department of Economics
School of Humanities and Social Sciences

Manipal University Jaipur

Presents

The WORLD CAFE

UNDERSTANDING SDGs



**MANIPAL UNIVERSITY
 JAIPUR**

Manipal University Jaipur (MUJ) was launched in 2011 on an invitation from the Government of Rajasthan, as a self-financed State University. MUJ has redefined academic excellence in the region, with the Manipal way of learning; one that inspires students of all disciplines to learn and innovate through hands on practical experience.

**A creative process
 for leading
 collaborative
 dialogue, sharing
 knowledge and
 creating
 possibilities for
 action in groups of
 all sizes.**

Convener
Mrs Minali Banerjee
+91 78 77 37 87 66
minali.banerjee@jaipur.manipal.edu

**DEPARTMENT OF
 ECONOMICS**

The Department of Economics at School of Humanities and Social Sciences is committed to provide students with elective mix of pure practical, analytical as well as theoretical knowledge in the areas of micro economics, macro economics, industrial and managerial economics, comparative economic policy issues, money and banking systems, international economics, quantitative analytical methods, understanding Indian and International economy and its system as well as the upcoming fields such as transport economics, environmental economics, energy economics, financial and Public economics, urban and regional economics etc. The Department offers Undergraduate, Postgraduate and PhD in Economics.

Monika
 Dr. Monika Mathur
 Head, Department of Economics
 Manipal University Jaipur

The World café- Understanding SDGs

April 27, 2022

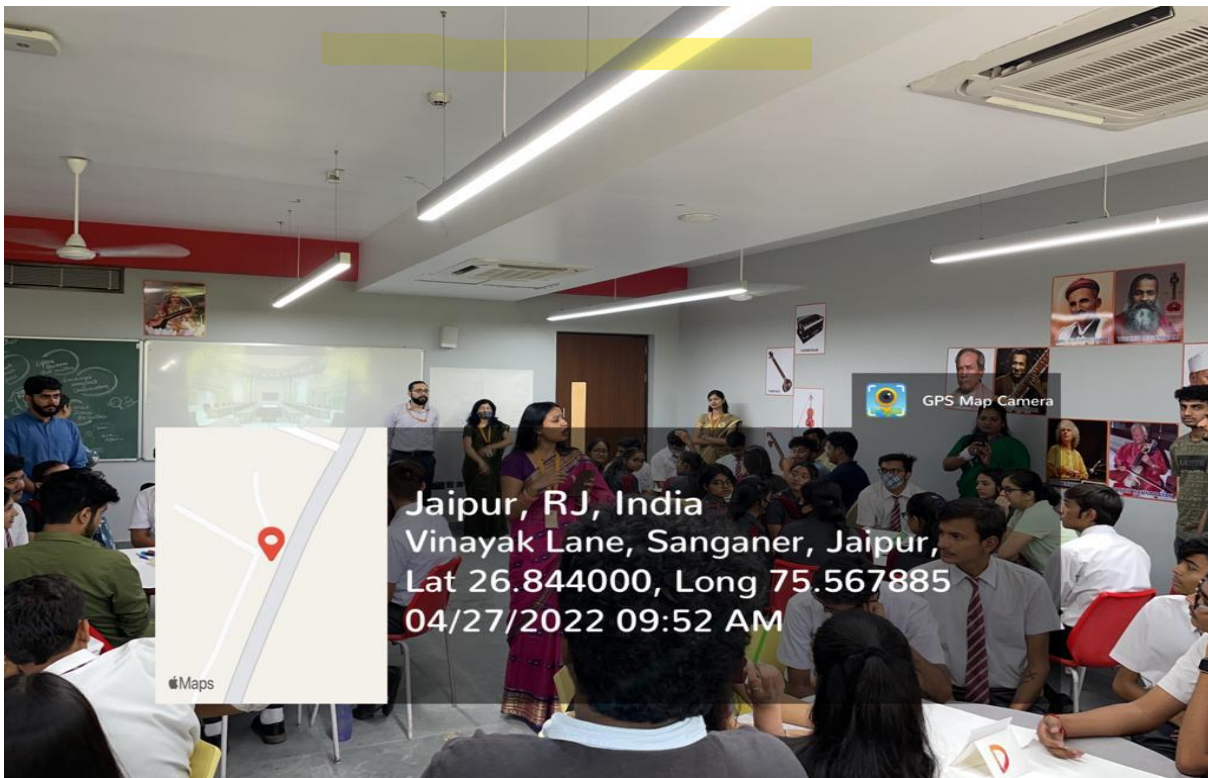
Introduction:

A school connect activity titled the World café was organised by the Department of Economics, School of Humanities and Social Sciences, Manipal University Jaipur on 'Sustainable Development Goals. Fifty-eight students of class XII from Spring field school, Mansarovar Jaipur, participated. The aim was to make students self-reflect and discuss some of the emerging global issues.

The three rounds of discussion took place on Poverty, Quality education, good health, climate action, responsible consumption, Economic growth, gender equality, and clean water. The students participated very enthusiastically. The discussion took place informally in a café setup. The students reflected on these issues by colouring their ideas into the chart papers.

The event winds up with some career counselling sessions.

Photographs:



Students participating in the activity



Students participating in the activity



Collage of different student tables

Monika
Dr. Monika Mathur
Head, Department of Economics
Manipal University Jaipur

Attendance:

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Link: <https://jaipur.manipal.edu/content/dam/manipal/muj/foa/Document/event-economics/The%20World%20caf%C3%A9-%20Understanding%20SDGs.docx>.


Dr. Monika Mathur
Head, Department of Economics
Manipal University Jaipur



Sustainable Water Extraction at Manipal University Jaipur

Water is an invaluable resource, and universities are increasingly taking the lead in adopting sustainable water extraction technologies to meet their needs while minimizing their environmental impact.

Manipal University Jaipur, situated in Jaipur, Rajasthan, serves as a prime example of a higher education institution committed to sustainable water management. Manipal University Jaipur utilizes innovative water extraction methods from aquifers. Balancing the water requirements of a university campus with the need for responsible environmental stewardship is no small task. Manipal University Jaipur ensures the extracted water meets quality standards for its intended use, be it for drinking, irrigation, or research purposes. Manipal University Jaipur is trying to minimize the energy footprint associated with water extraction and distribution systems to reduce greenhouse gas emissions. Manipal University Jaipur is implementing technologies and practices to maximize water efficiency and minimize waste. Manipal University Jaipur carefully manages aquifer extraction to maintain groundwater levels and protect surrounding ecosystems. Advanced monitoring systems track water levels and quality, allowing for prompt adjustments if issues arise. This ensures the aquifer remains a reliable long-term water source. High-efficiency pumping systems reduce the energy required for water extraction. Variable frequency drives and smart controls ensure pumps operate optimally, minimizing energy waste. To ensure water quality, Manipal University Jaipur employs state-of-the-art treatment processes. This includes filtration, chlorination, and ultraviolet (UV) disinfection to provide safe drinking water while minimizing the need for chemical additives.

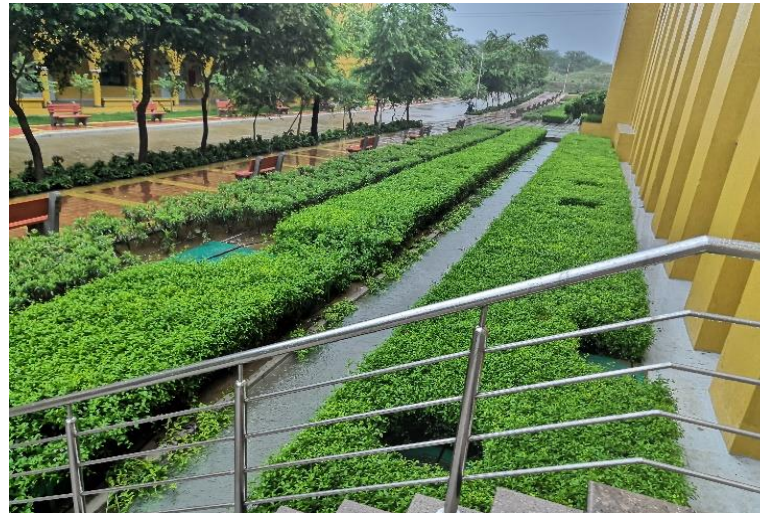
Manipal University Jaipur's approach to sustainable water extraction from aquifers on campus serves as a model for environmental stewardship and responsible water management in the academic world. By balancing its water needs with conservation efforts and efficient technologies, the university demonstrates that it is possible to meet water demands while safeguarding the environment.

Water
Conservation
Facility at MUJ
Campus: Through
Rain Water
Harvesting





USAGE OF RECYCLE WATER



- Zero Water Discharge Campus (Water Recycling)
- Sludge From STP Used As Manure For Landscaping. Reusing the debris waste for the pathways and road areas base compaction
- Vehicle Washing
- Gardening and Horticulture

Rainwater Harvesting- Water Canals in Campus



Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India
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Long 75.564334°
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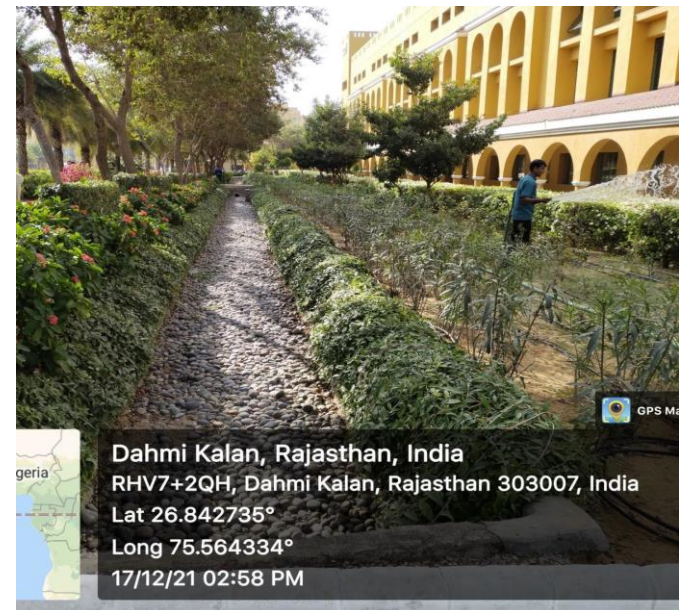
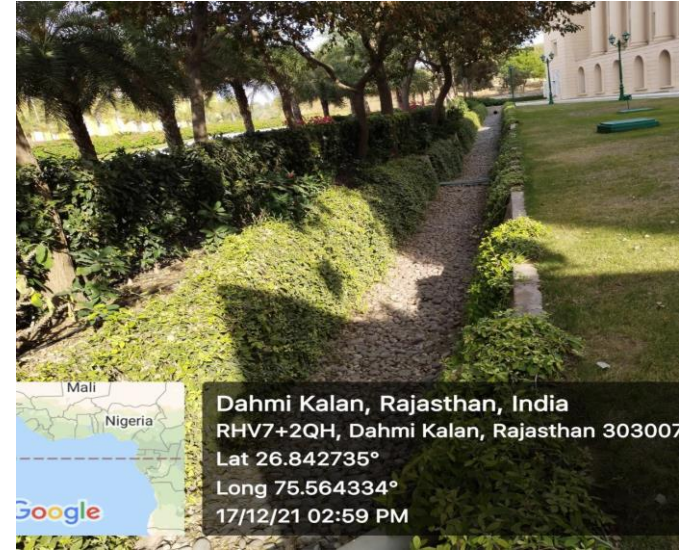


GPS Map C

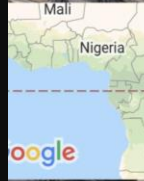
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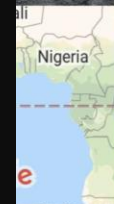
More than 14 KM of Water Canals in University for Water Harvesting



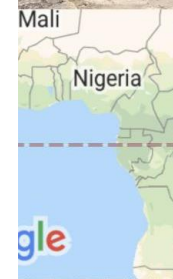
Peon Well Recharges Through Ponds



Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007,
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Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India
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Long 75.564334°
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Dahmi Kalan, Rajasthan, India
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Long 75.564334°
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Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India
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Long 75.564334°
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Construction of Ponds





Construction of Ponds

Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India

Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India

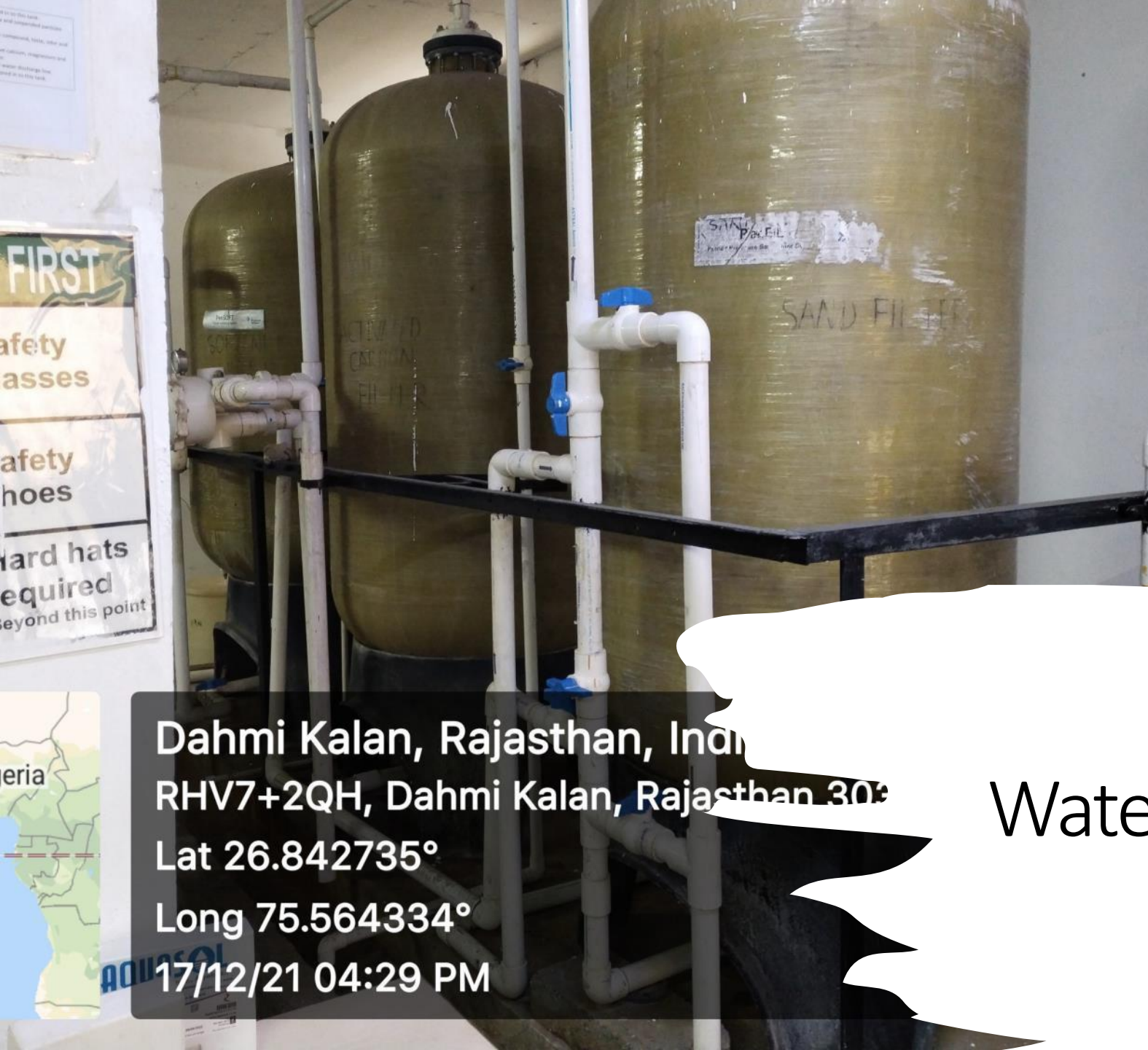
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Water Gathered in the Pond
During the Process of Rain
Water Harvesting





Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India
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Long 75.564334°
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Dahmi Kalan, Rajasthan, India
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Water Treatment Plants



Water Treatment Plants

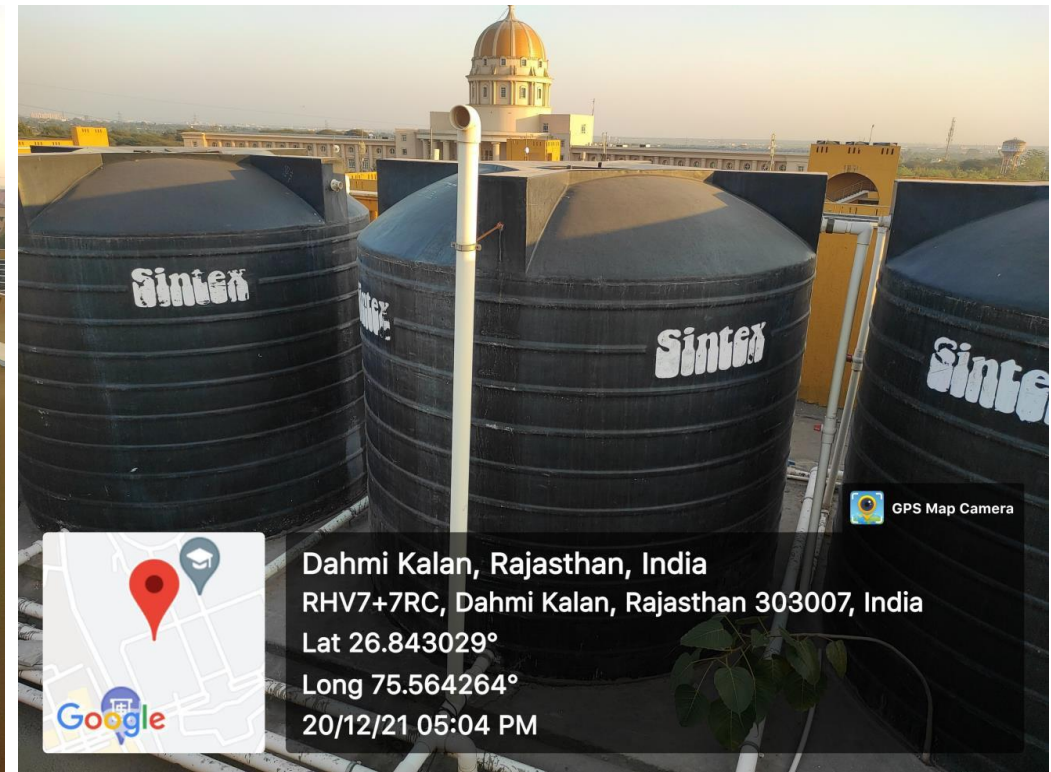
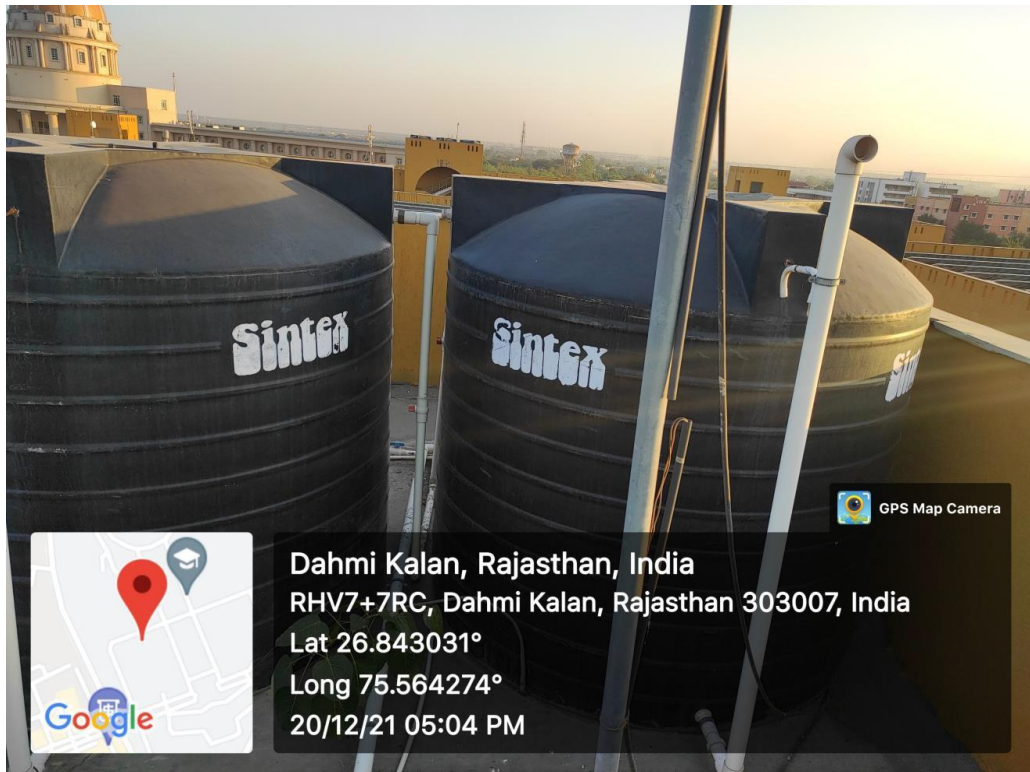
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RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India

Dahmi Kalan, Rajasthan, India
RHV7+2QH, Dahmi Kalan, Rajasthan 303007, India

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Water Distribution System





MANIPAL UNIVERSITY
JAIPUR



Manipal University Jaipur Collaborates with Governments to Ensure Water Security

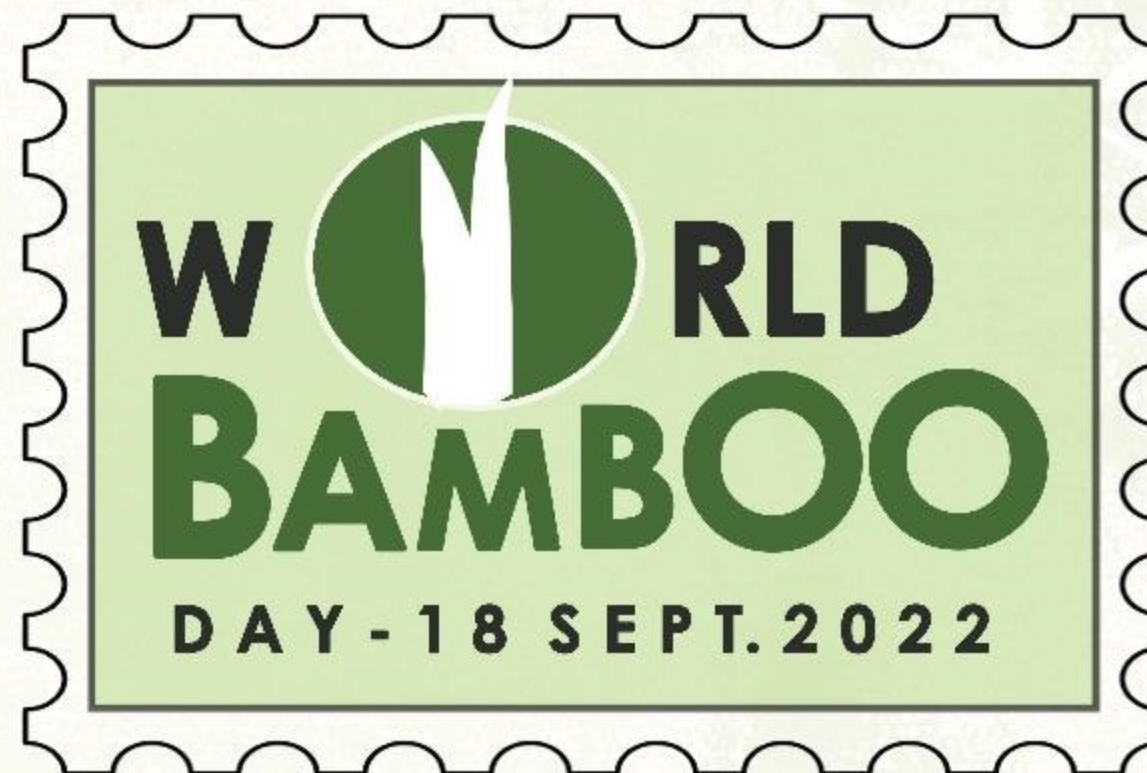
Water security is a global concern that transcends borders and demands cooperative efforts at various levels of governance. Water is a fundamental resource for all living organisms, ecosystems, and human societies. Ensuring water security is not just about having access to clean and safe drinking water but also about managing water resources sustainably. The impacts of water scarcity and contamination can be devastating, leading to health problems, agricultural disruptions, and even conflicts.

Manipal University Jaipur works with municipal and local governments to address water security issues. This involves research collaborations to develop innovative water treatment methods or the implementation of smart water management systems. For instance, a university might partner with a city government to design and deploy sensors that monitor water quality in real-time. On a regional scale, Manipal University Jaipur fosters cooperation among several local governments. It facilitates discussions and research projects to address regional water challenges, such as shared river basins or transboundary water resources. This cooperative approach can lead to agreements that promote equitable water allocation and reduce disputes among regions. National governments often look to universities for expertise in water management and policy development. Manipal University Jaipur collaborates with national agencies to conduct comprehensive assessments of water resources, draft legislation, and develop strategies for disaster preparedness and response. These partnerships can contribute to the creation of robust water security plans.

Water security is a complex challenge that necessitates collaboration across different levels of governance. Manipal University Jaipur, with its research capabilities, expertise, and innovative solutions, can play a pivotal role in partnering with local, regional, national, and global governments to ensure the sustainable management of water resources. By forging these alliances, Manipal University Jaipur moves closer to a future where every individual and community has access to clean and safe water, safeguarding the well-being of our planet and its inhabitants.



SEMINAR ON



KEYNOTE SPEAKERS



Er. Sanjeev Karpe
Founder & Director with Konkan
Bamboo & Cane Development
Centre (KONBAC)

BAMBOO VALUE ADDITION



Mr. Pasha Patel
Governing Council Member
Bureau of Indian Standards
(BIS) Govt. of India

BAMBOO PLANTATION

ORGANISED BY
FACULTY OF DESIGN

MANIPAL UNIVERSITY JAIPUR

VENUE : Sharda Pai Auditorium

TIME : 10:30 am - 12:30 pm

DATE : 18 September 2022

Faculty Coordinator
Ar. Sanjeev Pareek
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SOCIETAL PROJECT

on

Performance Appraisal of Low-cost Community Based Onsite Sanitation Systems in Ambient Environment of Jaipur City

(Financially supported by DST Rajasthan under the scheme of Swachh Bharat Mission)
Project file no. F8 (9)DST/SSD/2016/Part-1/3809

The present study investigates the efficiency and feasibility of an anaerobic onsite sanitation system for the treatment of household wastewater in actual field condition. The system consisted of a newly configured system consisting of two anaerobic bio-reactor within a single unit. The field-scale system is installed in Dehmi Kalan village in the vicinity of the Manipal University Jaipur. The feasibility of the system is identified on the basis of pollutant removal efficiency. In order to assess the efficiency, the system is feed with actual onsite wastewater generated from household activity with large fluctuations in the flow throughout a day. The finding reveal that the system achieved comparatively much higher removal efficiency than the existing conventional septic tank (CST) for COD, BOD and TSS as 90.2, 78.4 and 83.2% respectively, which ranged between 30 and 50% for CST for all the parameters. Thermotolerant coliform removal was also quite good at about 2.84 logs. Therefore, the present system can be a promising alternative to the CST for the treatment of domestic wastewater, particularly in the rural areas of the developing countries.

A. Lab-scale reactor in actual field condition:





B. Pilot-scale reactor in Dehmi Kalan Village:







Figure: Quality of wastewater after treatment using anaerobic treatment plant

Based on the performance analysis, the system is showing substantially higher pollutant removal efficiency with a better-quality effluent. The quality of the treated wastewater is such that the household owner is recycling and reusing it in gardening purpose. The present system can be installed at a low cost and in short period of time. Thus, the present system with a simple design, low-cost involvement and electricity-free operability has a significant potential to be considered as an alternative to the conventional septic tank for the treatment of domestic wastewater in the non-sewered rural and peri-urban areas of the developing countries like India.