14 LIFE BELOW WATER

Conserve and sustainably use the oceans, seas & marine resources for sustainable development

LIFE BELOW WATER

PROGRESS REPORT 2022-23

Manav Rachna International Institute of Research and Studies

(Deemed to be University under section 3 of the UGC Act,1956)

Contents:

1. PREAMBLE

Water covers over 70% of the Earth's surface and play a vital role in regulating the planet's climate, supporting biodiversity, and providing resources essential for life. However, these precious ecosystems face numerous threats, including overfishing, pollution, climate change, and habitat destruction. SDG 14 aims to address these challenges and promote the responsible stewardship of the world's marine resources.

Despite India's significant population, accounting for 18% of the global total, the country possesses just 4% of the world's freshwater resources. As a result, India faces a formidable challenge in effectively managing its water resources. This challenge is aggravated by factors such as population growth, changing lifestyles, rapid industrialization, and the constant pressure to increase agricultural output. At present, India withdraws 710 km^3 of water annually, exceeding the sustainable resource of 1,123 km^3. Projections suggest that demand will increase to 1,180 km^3 by 2050. Additionally, growing pollution from both natural sources and human activities places significant constraints on India's water resources, compounding the challenges. Climate change, another critical concern, introduces uncertainty regarding the availability of water resources in terms of location and timing.

To ensure the sustainable management of its water resources, India must reconsider and reshape its current practices and governance policies. Agriculture accounts for the majority, approximately 78%, of total water usage, with 8% allocated to industry and power, and the remaining 6% going to the domestic sector. Effective and prudent management requires innovations in the water sector, the application of advanced technologies, capacity building, empowerment of all stakeholders, encouragement of innovative investments, promotion of efficient water reuse, and improvement of freshwater and sanitation systems.

Currently, about half of the global population resides in urban regions, with nearly 10% living in megacities. As cities undergo rapid expansion, the need to ensure their sustainable growth, efficient functioning, and the preservation of a high quality of life for residents becomes increasingly crucial. This is where the concept of "smart cities" comes into play. The term "smart cities" has gained traction among governments, urban planners, and the private sector as they strive to address the future needs of urban areas. A critical element in the growth and sustainability of smart cities is their water systems. The notion of "smart

water" pertains to water and waste water infrastructure designed to ensure the efficient management of this valuable resource and the energy utilized for its conveyance. Equally vital is the imperative to reduce the pressures on our planet and its water resources to enhance their sustainability.

In response to these difficulties, Manav Rachna International Institute of Research and Studies (MRIIRS) has founded the Manav Rachna Centre for Advanced Water Technology and Management, aimed at contributing to the efficient and sustainable handling of India's water resources. This will be achieved through innovative approaches, capacity enhancement, and outreach initiatives. Keeping in view the importance of unpolluted water for the aquatic life, MRIIRS minimizes the water usage by incorporating various measures including Waste Water Treatment, maintaining Water Conscious Building Standards, Water Conscious Planting, and by conducting awareness programmes to promote conscious water usage on Campus and in the Wider Community.

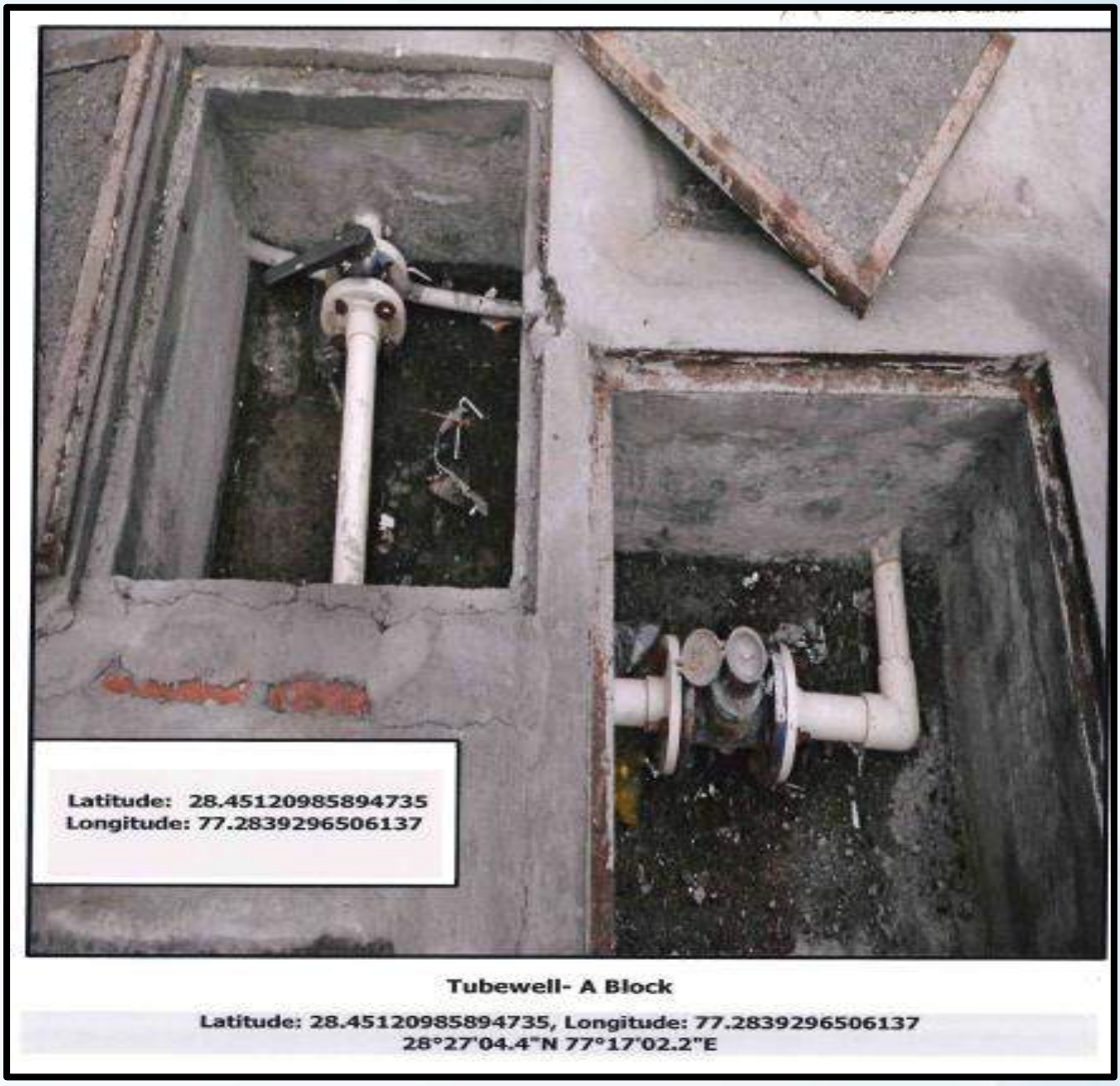
ManavRachna Centre for Advanced Water Technology & Management (MRCAWTM), established in 2017, is dedicated to educational, research, consulting, and training activities related to hydrogeology, water resources engineering and management, water quality, and associated environmental and ecological concerns.

2. MRIIRS- Water Resources

ManavRachna International Institute of Research and Studies (MRIIRS) demonstrates a profound commitment to environmental sustainability and the preservation of aquatic life by adopting a responsible water management approach. To safeguard aquatic ecosystems and prevent any harm to aquatic life, MRIIRS has chosen not to rely on water sourced from rivers or lakes. Instead, the institution emphasizes sustainable water practices, including responsible consumption and recycling, to minimize its impact on natural water sources. By taking this conscientious approach, MRIIRS actively contributes to the protection of aquatic life, reinforcing its dedication to environmental conservation and responsible resource management.

MRIIRS relies entirely on groundwater as its water source, drawing water from three campus tube wells (TWs), each equipped with a water flow meter. These tube wells serve

as the primary water source for the campus, extracting groundwater from an aquifer formed through secondary porosity resulting from the weathering and fracturing of quartzites within the Delhi Supergroup. Water consumption across the campus is accurately measured using established Standard Operating Procedures (SOPs).



Tubewell-1: Location- A Block

Tubewell-2: Location- Football ground

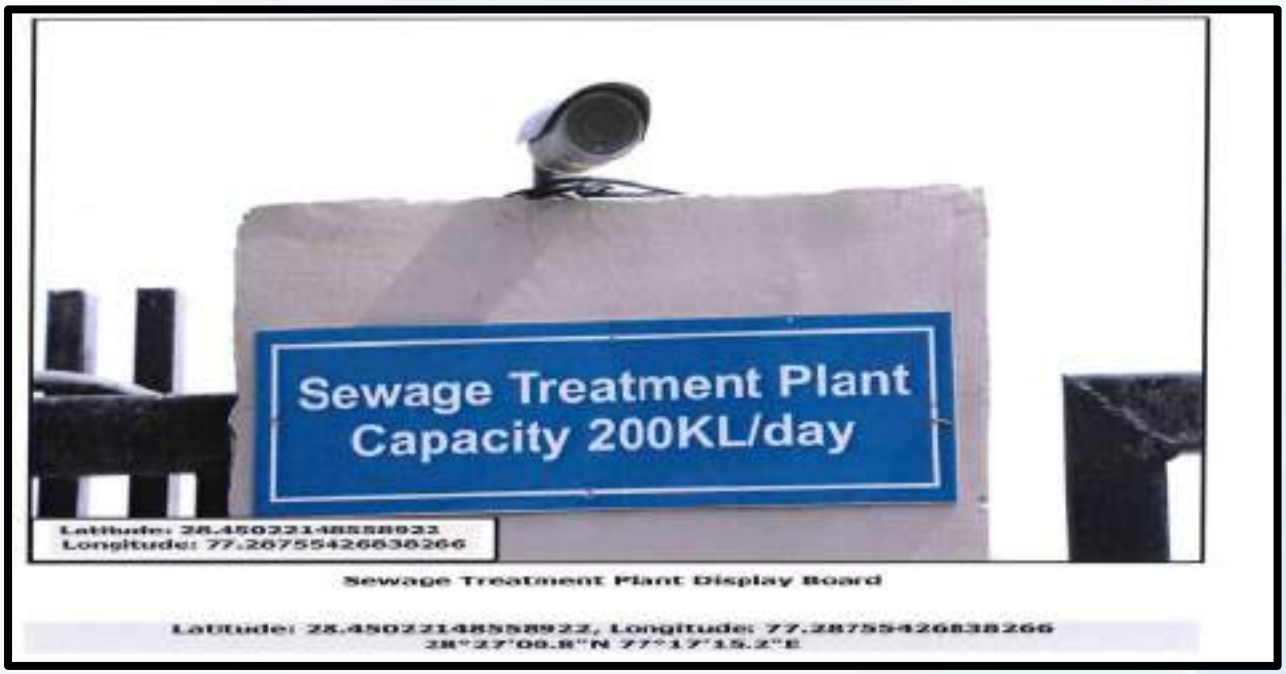
Tubewell-3: Location- Girls Hostel

3. Water Conservation at MRIIRS

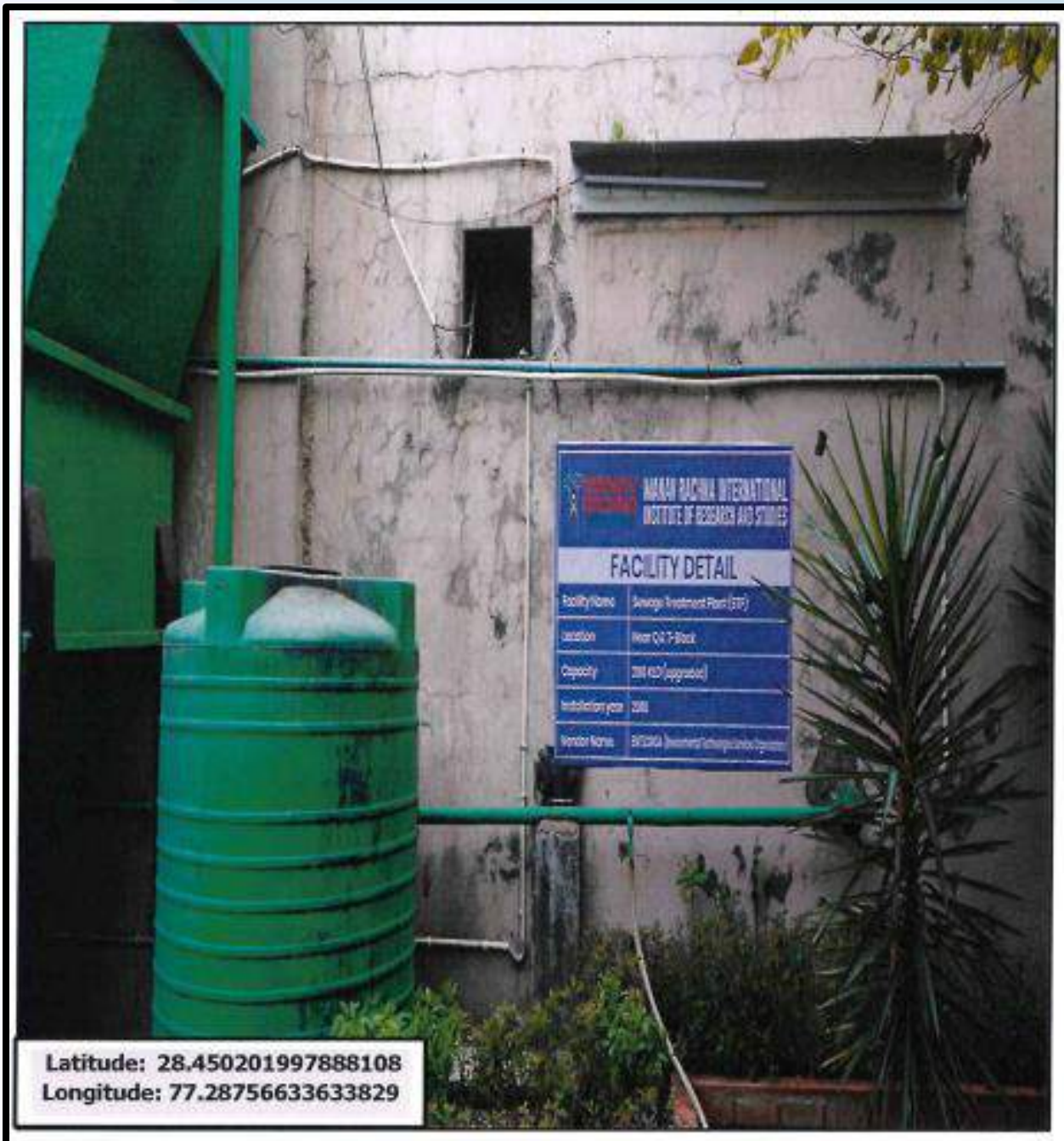
Water conservation at ManavRachna International Institute of Research and Studies (MRIIRS) is a top priority, reflecting the institution's commitment to sustainability and responsible resource management. The campus has implemented a range of strategies and practices to minimize water consumption and ensure its efficient use.

3.1 MRIIRS-Waste Water Treatment Process

MRIIRS has installed a **200KL/Day** Sewage Treatment Plant (STP) to treat the sewage generated within the campus. Underground drains are constructed connecting all the buildings to the STP. The site of STP is kept in the down slope end of the campus, so as to facilitate the gravitational movement of sewage to STP. Annual discharge of STP is **3574 KL (2022-23).** From the measurement it is calculated that **Average7.90 KL/Day** discharge is obtained from STP. It uses to generate sufficient treated waste water per day to irrigate **2.87ha** planted landscape within the lush green campus and for flushing purposes. The output water quality of STP is maintained keeping Biochemical Oxygen Demand (BOD) within permissible level. Frequent analysis of output water is done to keep check on its quality.



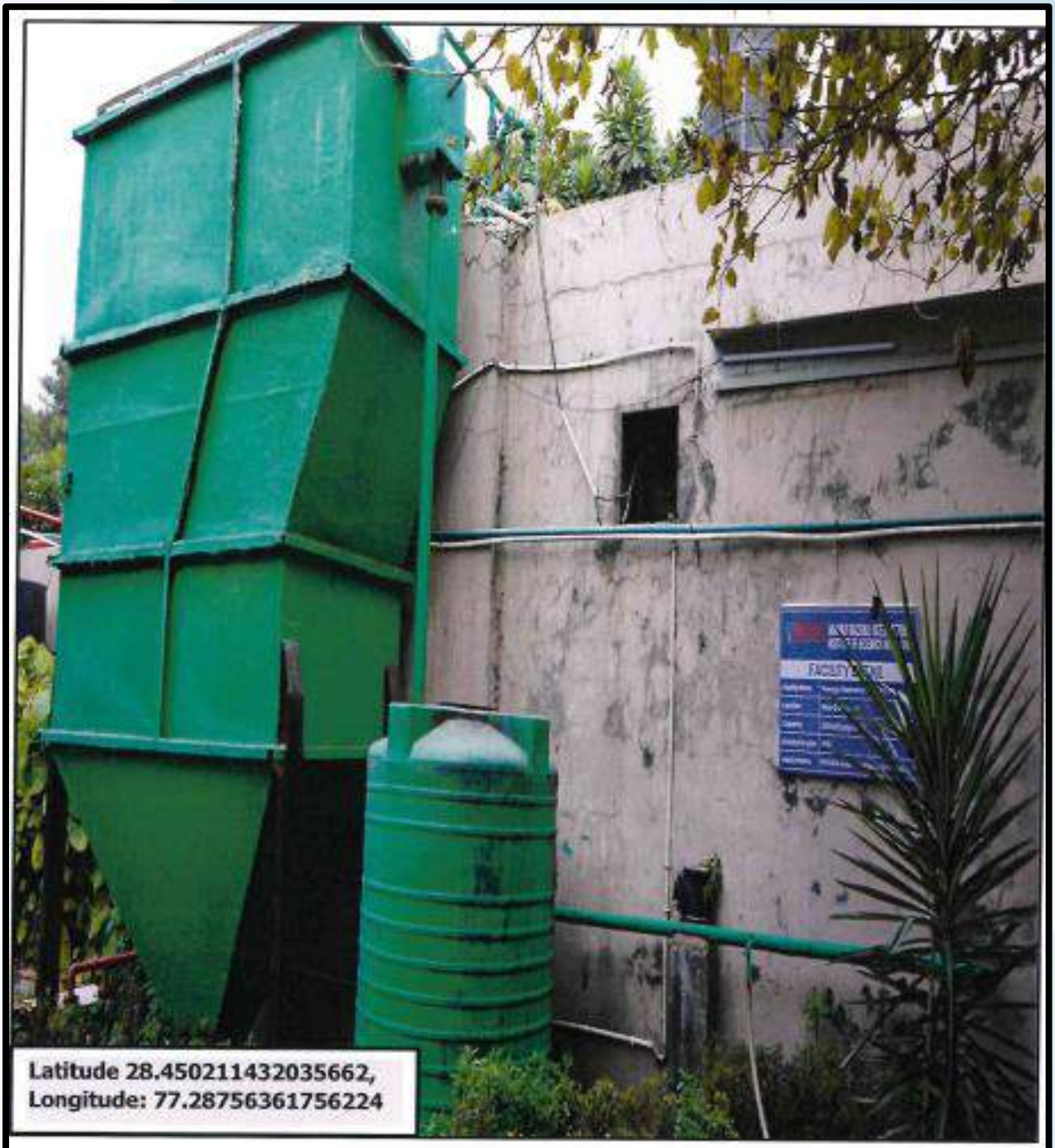
Sewage Treatment Plant



Sewage Treatment Plant Specifications

Latitude: 28.450201997888108, Longitude: 77.28756633633829
28°27'00.7"N 77°17'15.2"E

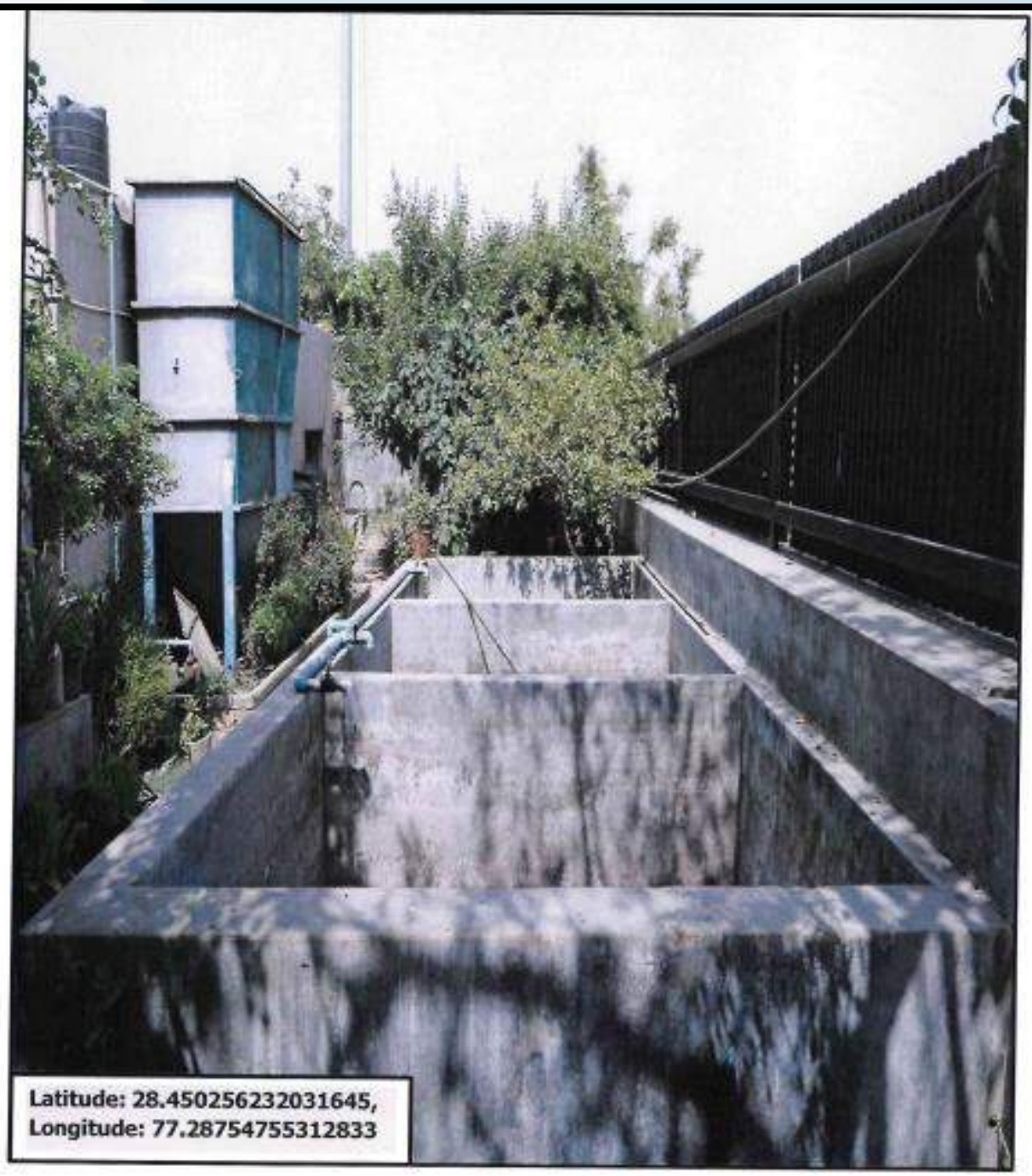
Sewage Treatment Plant



Sludge Tanks ,Sewage Treatment Plant

Latitude: 28.450211432035662, Longitude: 77.28756361756224
28°27'00.8"N 77°17'15.2"E

Sewage Treatment Plant



Sludge Dry Bed Sewage Treatment Plant Alternate View

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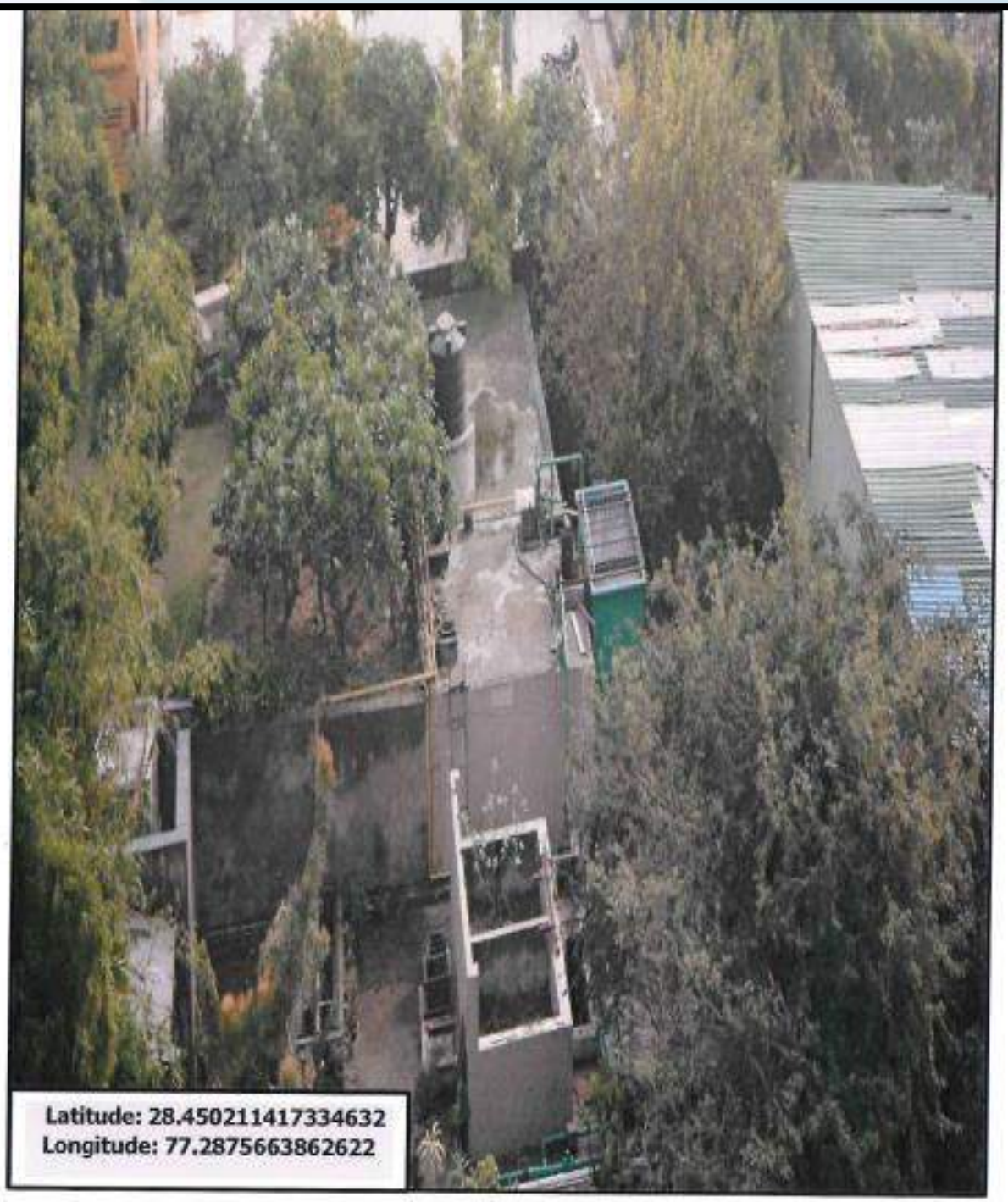
28°27'00.9"N 77°17'15.2"E

Sewage Treatment Plant



Sewage Treatment Plant Aerial View

Latitude: 28.450211417334632, Longitude: 77.2875663862622
28°27'00.8"N 77°17'15.2"E

3.2 Sustainable Water Extraction on Campus

MRIIRS for sustainability of water extraction has practiced Rooftop Rainwater Harvesting in the campus. MRIIRS follows all sustainable water-conscious building standards for water extraction. It has adopted green building norms. Toilets are constructed in such a manner that head loss remain minimum. All overflows are channelized back to sump well. Drinking water and raw water OHT are kept separate. MRIIRS has installed **roof top rain water harvesting system** in the campus. Also, water saving fixtures and sensors have been installed to taps and toilets.

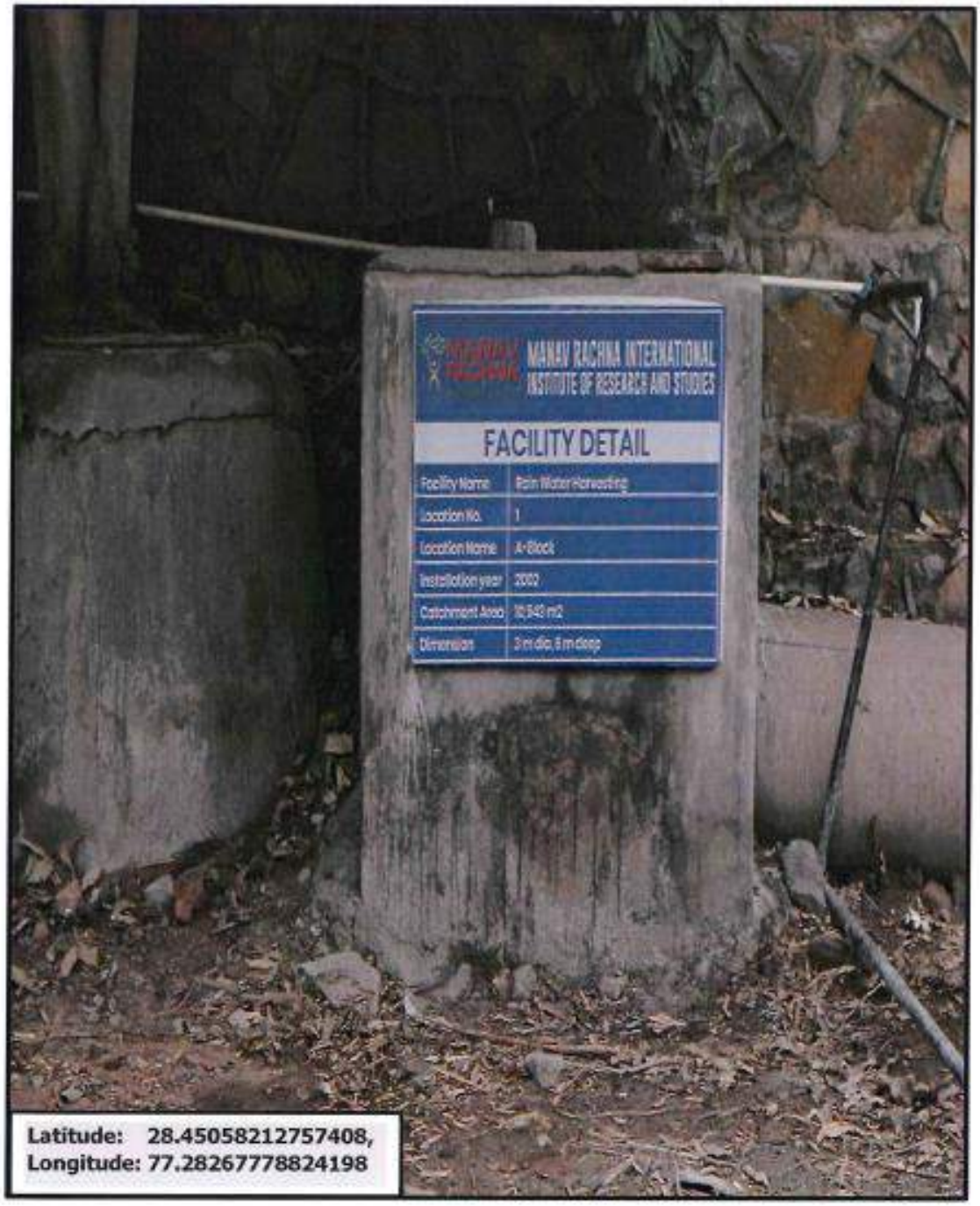
3.3 Water Conscious Building Standards

MRIIRS follows all water-conscious building standards to minimize the water use. It has adopted green building norms. Toilets are constructed in such a manner that head loss remain minimum. All overflows are channelized back to sump well. Drinking water and raw water OHT are kept separate. MRIIRS has installed roof top rain water harvesting system in the campus. Also, water saving fixtures and sensors have been installed to taps and toilets.

3.4 Rainwater Harvesting System at MRIIRS

Rainwater harvesting is the collection and storage of rainwater that runs off from the building tops, paved roads and other kinds of open spaces such as parks. Four rainwater harvesting systems have installed in Block A Parking, Block C, near Gate No. 7 of Block T and Block Q of the campus. Total quantity of run off generated from the campus is 4.8770 ham/ year.

Rainwater Harvesting System at MRIIRS



Rain Water Harvesting Specifications A Block

Latitude: 28.45058212757408, Longitude: 77.28267778824198
28°27'02.1"N 77°16'57.6"E

Rainwater Harvesting System at MRIIRS

Rain Water Harvesting A, Block

Latitude: 28.45043372846215, Longitude: 77.28271728071604
28°27'01.6"N 77°16'57.8"E

Rainwater Harvesting System at MRIIRS

Rain Water Harvesting Ground Water Recharge Well C Block

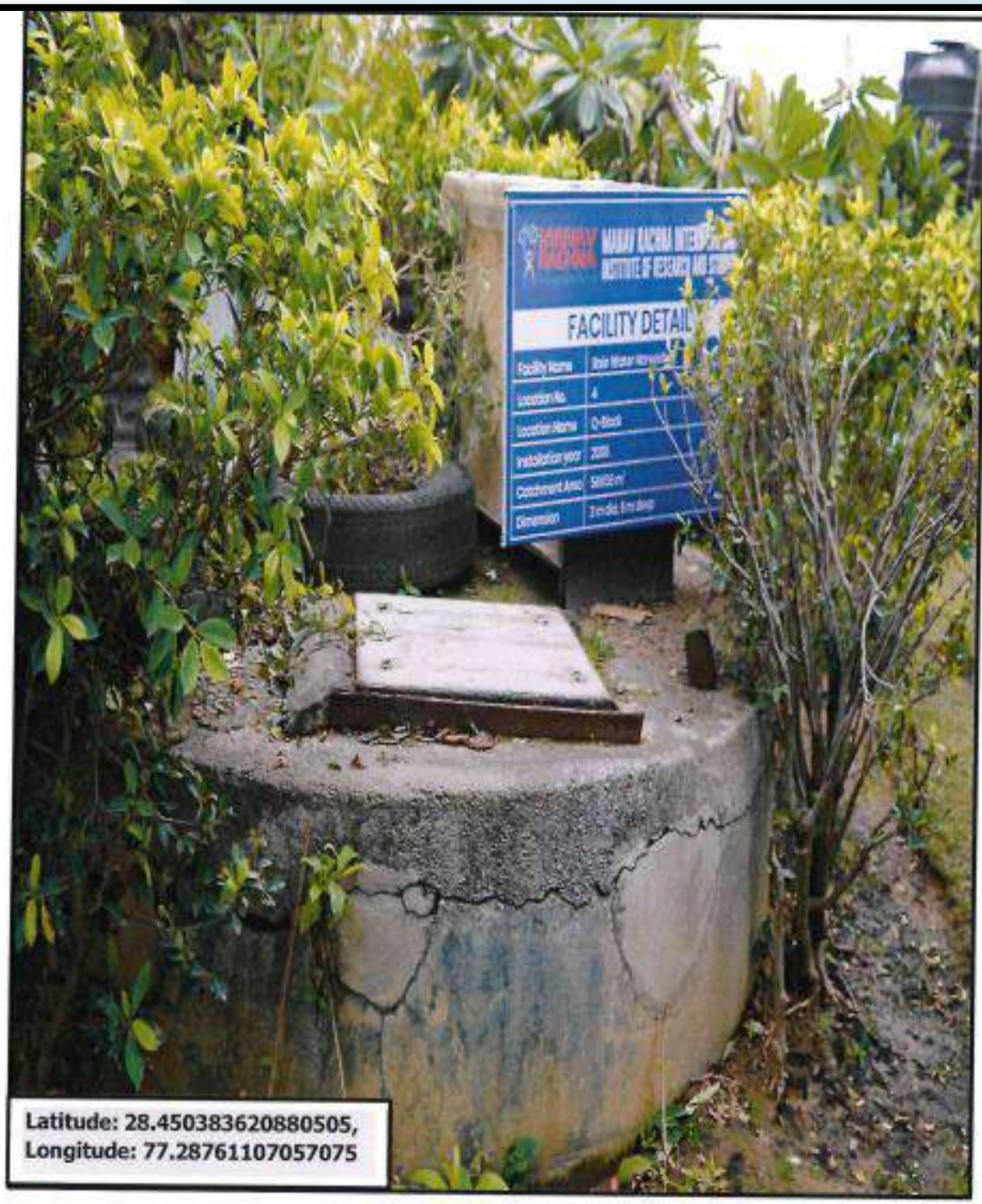
Latitude: 28.449680103517967, Longitude: 77.2826622628365
28°26'58.9"N 77°16'57.6"E

Rainwater Harvesting System at MRIIRS

Rain Water Harvesting Ground Water Recharge Shaft T Block

Latitude: 28.449561886511788, Longitude: 77.28678960011572
28°26'58.4"N 77°17'12.4"E

Rainwater Harvesting System at MRIIRS



Rain Water Harvesting Q Block

Latitude: 28.450383620880505, Longitude: 77.28761107057075
28°27'01.4"N 77°17'15.4"E

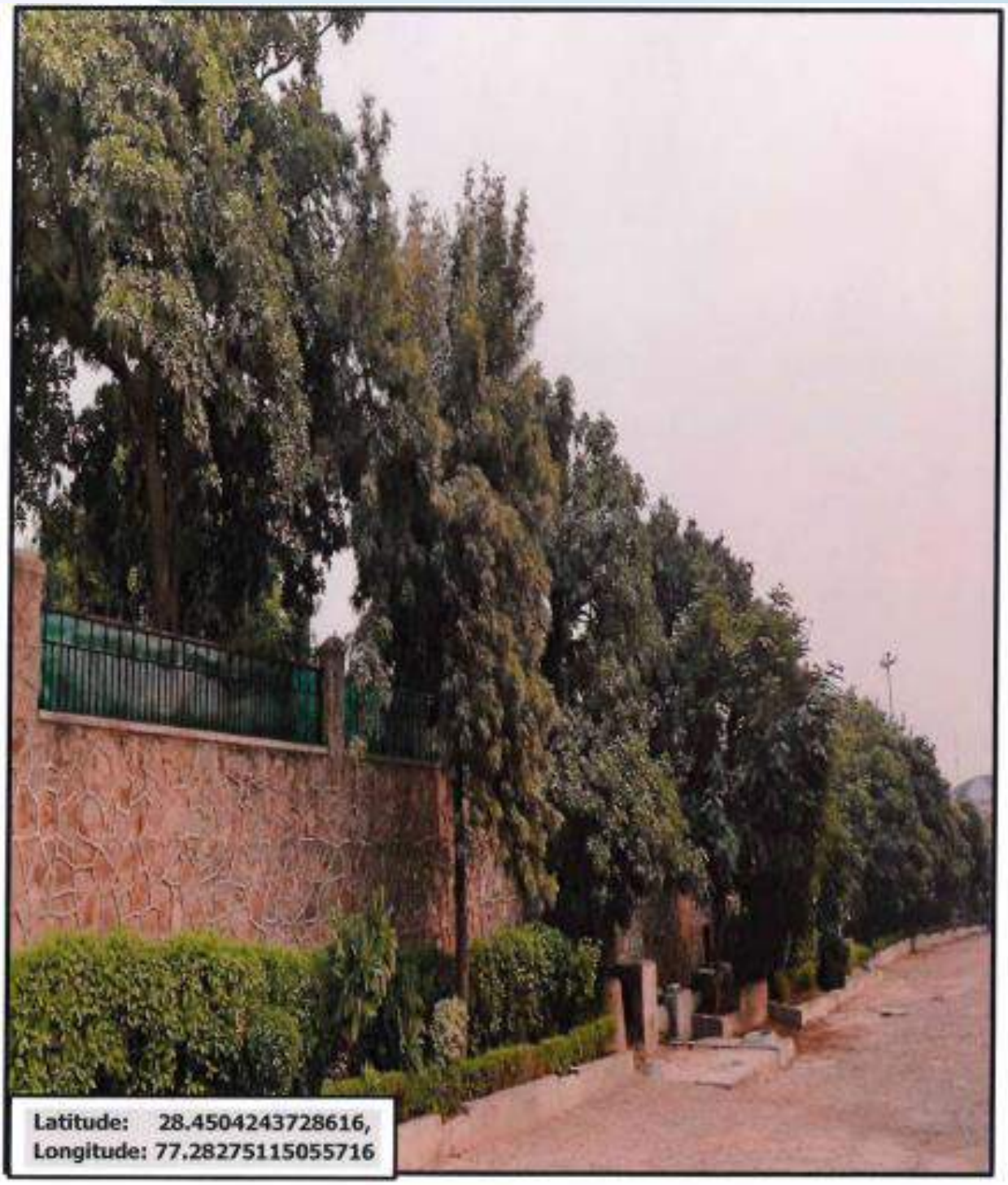
3.5 Water Conscious Planting

MRIIRS is having specially designed and well maintained 2.87 ha lush green plant landscape. The water treated through STP is used to irrigate the huge landscape of MRIIRS. To minimize use of water in horticulture within campus several drought-tolerant varieties of plants are adopted.

- The gardens have been designed following the **water conscious planting**.
- **Overhead sprinkler systems** are used to water the plants in more efficient manner and to minimize the water usage.
- The **ManavRachna Centre for Medicinal Plant Pathology**, established at MRIIRS, includes the promotion of Soil and Water Conservation Practices as one of its objectives. This initiative aids the ManavRachna horticulture team in choosing **drought-resistant plants** within MRIIRS, thereby **reducing water consumption.**

	List of Drought Tolerant Plants at MR Campus		
S. No	**Common Name**	**Botanical Name**	**Link to description**
1	**Silver oak**	***Grevillearobusta***	http://mrcmpp.in/wp-content/uploads/2022/06/165-Sliver-oak.pdf
2	**Bottlebrush**	***Callistemon accuminatus***	http://mrcmpp.in/wp-content/uploads/2022/06/167-Bottle-brush2193.pdf
3	**Ashoka**	***Polyalthialongifolia***	http://mrcmpp.in/wp-content/uploads/2022/06/168-Ashoka.pdf
4	**Sisam**	***Dalbergiasissoo***	http://mrcmpp.in/wp-content/uploads/2022/07/1267.sisam_.pdf
5	**Guava**	***Psidiumguajava***	http://mrcmpp.in/wp-content/uploads/2022/07/1268-Guava.pdf
6	**Bendy Tree**	***Thespesiapopulnea***	http://mrcmpp.in/wp-content/uploads/2022/07/1278-Bendy-tree.pdf
7	**Kachnar**	***Bauhinia vareigata***	http://mrcmpp.in/wp-content/uploads/2022/07/1277-kachnar4009.pdf
8	**Calliandra**	***Calliandrahaematocephala***	http://mrcmpp.in/wp-content/uploads/2022/07/1280-callindra.pdf
9	**Semel**	***Bombaxceiba***	http://mrcmpp.in/wp-content/uploads/2022/07/1345-Semel.pdf
10	**Rudraksha**	***Elaeocarpusangustifolius***	http://mrcmpp.in/wp-content/uploads/2022/07/1409.-Rudraksha.pdf

11	**Jade plant**	***Crassulaovata***	http://mrcmpp.in/wp-content/uploads/2022/07/1356.-jade-plant2977.pdf
12	**Sanseiveria**	***Sansevieriatrifasciata***	http://mrcmpp.in/wp-content/uploads/2022/07/1266-Sansevieria-trifasciata2903.pdf
13	**Kaner**	***Cascabelathevetia***	http://mrcmpp.in/wp-content/uploads/2022/07/1264.-kaner4007.pdf
14	**Spider plant**	***Chlorophytumcomosum***	http://mrcmpp.in/wp-content/uploads/2022/07/1260-spider-plant.pdf
15	**Red sage**	***Lantana camara***	http://mrcmpp.in/wp-content/uploads/2022/07/1227-lantana-new.pdf
16	**Murraya**	***Murrayapaniculata***	http://mrcmpp.in/wp-content/uploads/2022/07/1221.-Murraya.pdf
17	**Bismarckia palm**	***Bismarckianobilis***	http://mrcmpp.in/wp-content/uploads/2022/06/176.-Bismarckia-palm.pdf
18	**Malabar plum**	***Syzygiumcumini***	http://mrcmpp.in/wp-content/uploads/2022/06/186.-Malabar-plum.pdf
19	**Indian banyan**	***Ficusbenghalensis***	http://mrcmpp.in/wp-content/uploads/2022/06/187.-Indian-banyan.pdf
20	**Gular**	***Ficusracemosa***	http://mrcmpp.in/wp-content/uploads/2022/06/192.-Gular.pdf
21	**Yellow bells**	***Tecomastans***	http://mrcmpp.in/wp-content/uploads/2022/06/203.-yellow-bells.pdf
22	**Pilkhan**	***Ficusvirens***	http://mrcmpp.in/wp-content/uploads/2022/06/222.-Pilkhan2353.pdf
23	**Foxtail palm**	***Wodyetiabifurcata***	http://mrcmpp.in/wp-content/uploads/2022/06/230.-Foxtail-palm2360.pdf
24	**Crown of Thorns**	***Euphorbia milli***	http://mrcmpp.in/wp-content/uploads/2022/06/244.-Euphorbia2392.pdf
25	**Juniperes**	***Juniperuscommunis***	http://mrcmpp.in/wp-content/uploads/2022/06/245.-Juniperes2376.pdf
26	**Crepe myrtle**	***Lagerstroemia indica***	http://mrcmpp.in/wp-content/uploads/2022/06/252.-Crepe-myrtle2288.pdf
27	**Starlight ficus**	***Ficusbenjamina***	http://mrcmpp.in/wp-content/uploads/2022/07/1187-Starlight.pdf
28	**Ponytail Palm**	***Beaucarnearecurvata***	http://mrcmpp.in/wp-content/uploads/2022/06/402.-ponytail-palm2436.pdf
29	**Pencil Stick Cactus**	***Euphorbia tirucalli***	http://mrcmpp.in/wp-content/uploads/2022/06/404.-pencil-cactus2440.pdf
30	**Conocarpus**	***Conocarpus erectus***	http://mrcmpp.in/wp-content/uploads/2022/07/1079.-Conocarpus.pdf



Landscaping with Trees- Gate No.1 parking area

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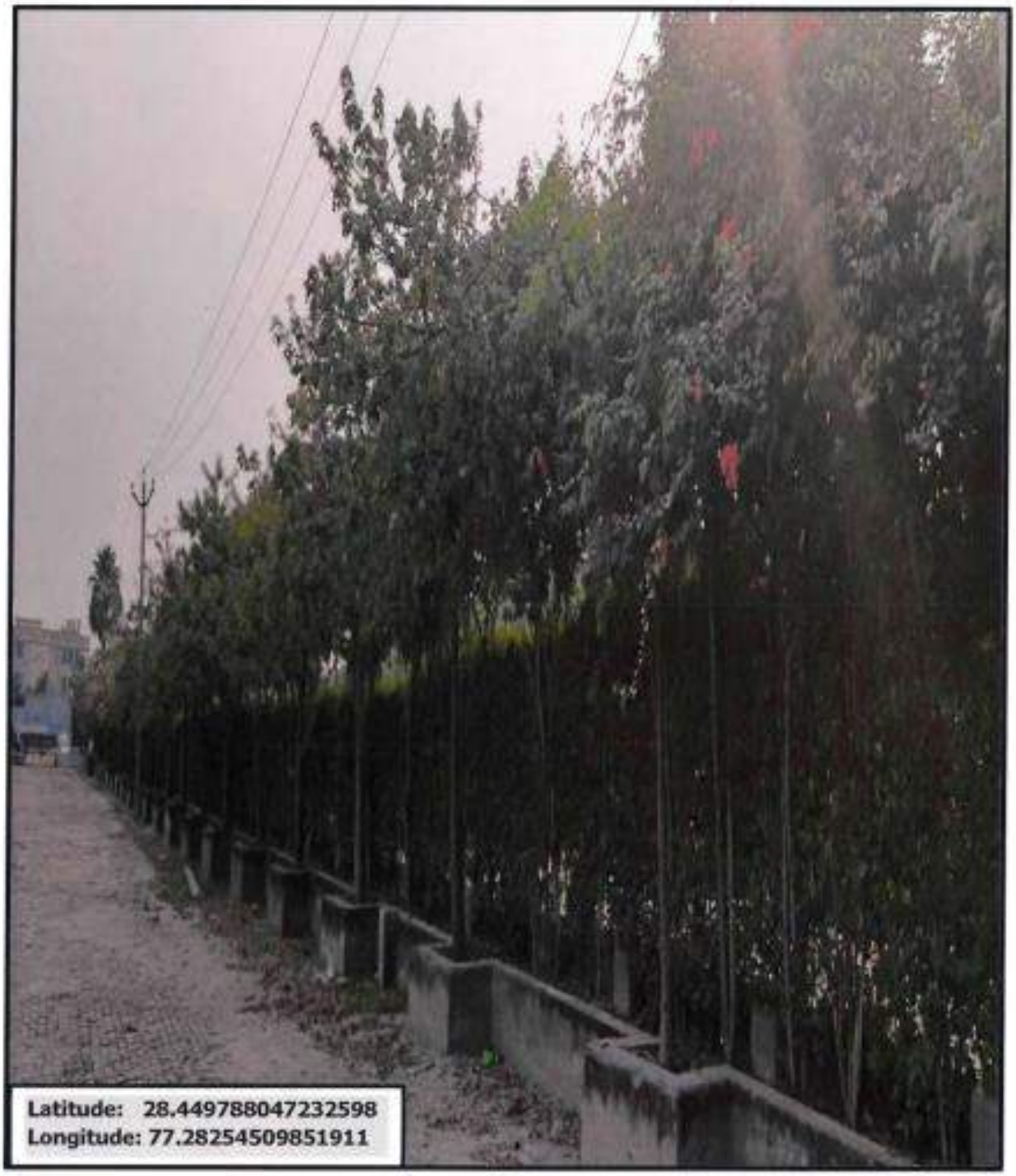
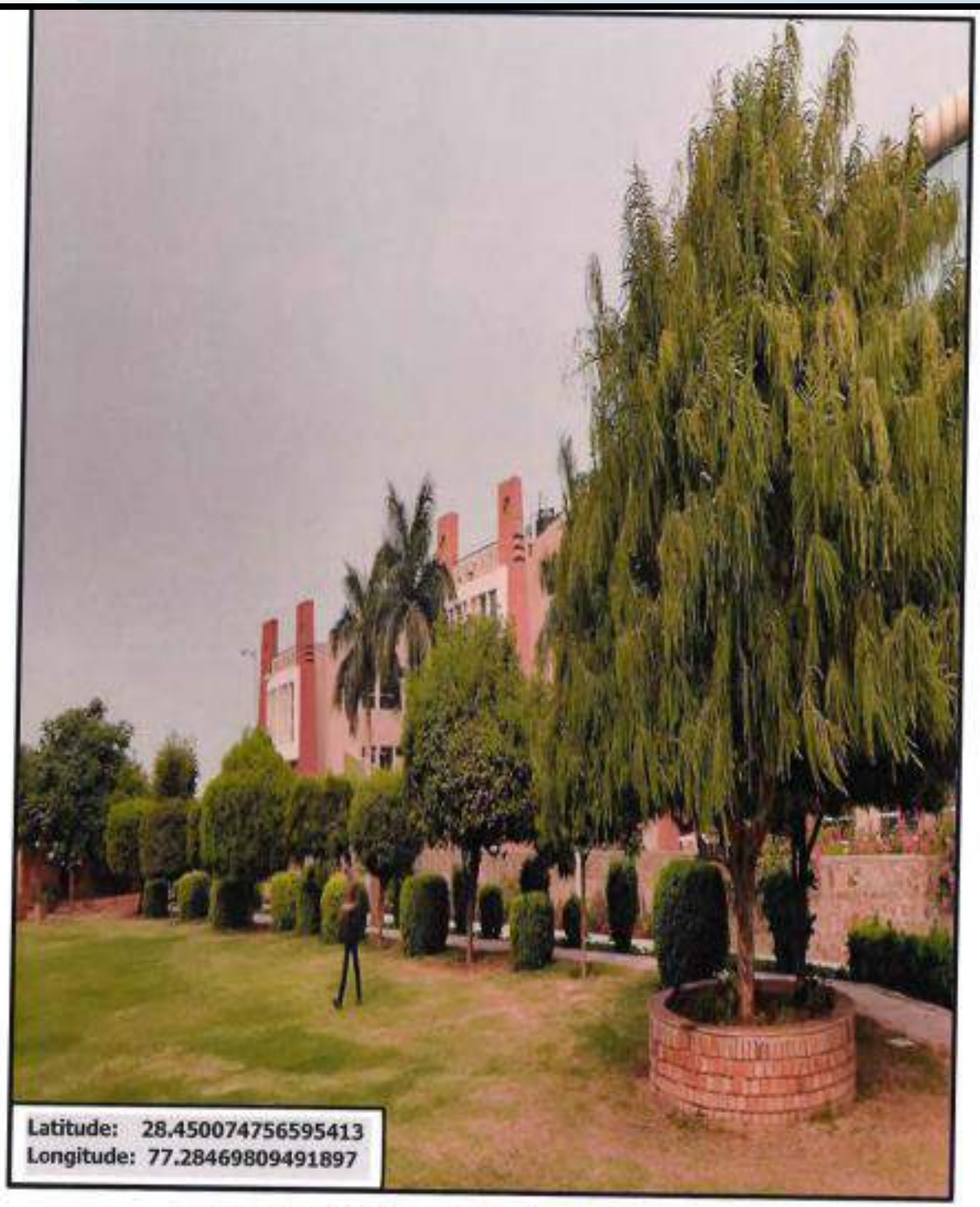
28°27'01.5"N 77°16'57.9"E



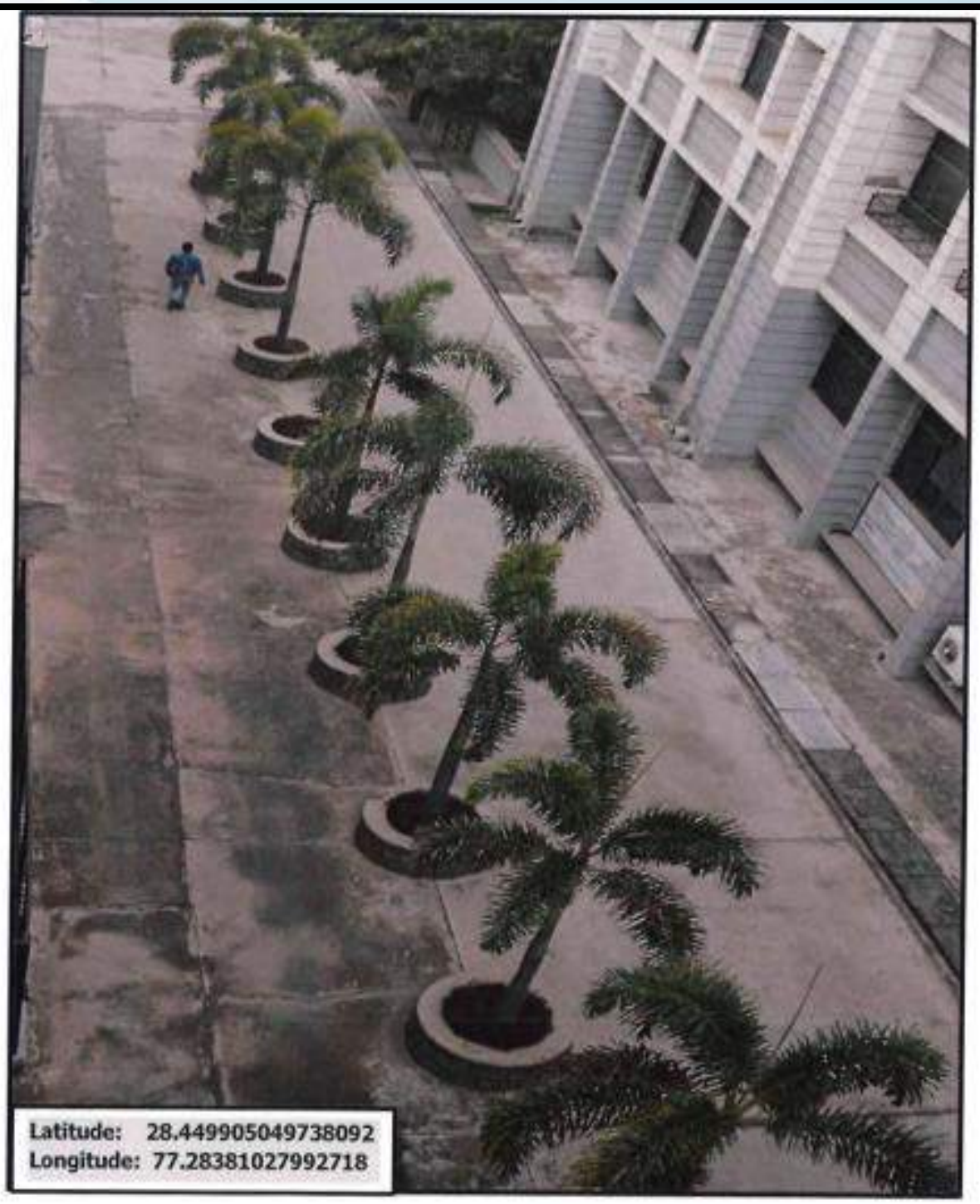
Landscaping with Trees-Gate No. 3

Latitude: 28.449788047232598, Longitude: 77.28254509851911
28°26'59.2"N 77°16'57.2"E



Landscaping with Trees- Central Lawn Alternate View

Latitude: 28.450074756595413, Longitude: 77.28469809491897
28°27'00.3"N 77°17'04.9"E



Landscaping of Trees- Between B and C Block

Latitude: 28.449905049738092, Longitude: 77.28381027992718
28°26'59.7"N 77°17'01.7"E

4. Water Reuse at MRIIRS

- **Water Reuse Policy of MRIIRS**

MRIIRS is having in place green policy for campus that incorporates policy for reuse and recycle of water and is revised time to time. The Water Conservation and Management Section of the Green Policy that highlights the emphasis on water recycling and water re-usage is reiterated as follows:

"MRIIRS realizes that water is a valuable resource and all possible measures should be taken for its conservation. There should be discipline on water usage, and consumption of water should be economized. Water is to be recycled and reused as much as possible aiming towards zero discharge. Drought tolerant plants should be preferred as far as possible in plant landscaping to minimize the water use."

Link for the Policy for Water Reuse: Click to view

- **Water Reuse Measurement- Conserving Ground Water**

MRIIRS generates monthly Av 297.8kL water through STP (3574kLper Annum) which is 7.71 kL/day. This reclaimed water is used for horticulture and toilet flushing. It not only saves precious groundwater but also reduce energy consumption in extracting groundwater from aquifer. So, as it helps in conserving groundwater resource. Thus, recycling of water is reducing carbon foot print of the campus.MRIIRS has also installed rain water harvesting system in the campus.

5. AWARENESS SESSIONS ORGANIZED FOR STUDENTS AND FACULTY MEMBERS ON WATER CONSERVATION

- **Pledge on Water Conservation**

To spread awareness amongst the students and faculty members about Water Conservation (Sustainable Development Goal- SDG6) and motivate all towards commitment to the cause and also to inculcate Water Conservation practices in our day-to-day life, a pledge taking ceremony on Water Conservation was organised by Department of Computer Science and Engineering, School of Engineering and Technology, ManavRachna International Institute of Research and Studies (MRIIRS) on August 23, 2023.

- **Workshop on Water and Life 1.0**
  MRIIRS organized a comprehensive **one week workshop on Water and Life 1.0** from July 24 to July 28, 2023. The workshop aimed to enlighten participants about the significance of water conservation, promote awareness about clean water and sanitation practices, and introduce the concept of a Water Audit for better water management.

- **'Mathematical Modelling' on Groundwater System**

  A **workshop** on **'Mathematical Modelling' on Groundwater System** was organized by MRIIRS on 5th August, 2023. WaterresearchexpertsfromalloverIndia including Scientists, Academicians, Professionals and Researchers from CGWB, IIT Delhi, Delhi University, IWMI, Civil Engineering Dept. MRIIRS, various consulting organisations like Akshat Ground Water Consultancy Service, Faridabad, NWIC, New Delhi, Floodkon, Noida etc. connected together through the workshop to discuss the recent innovations in the field of Groundwater System.

- **International Water Summit**

  A one-day **International Water Summit** on the theme of **Water Security in India - Challenges & Prospects** was organized was organized by MRIIRS on 24th February 2023. Water research experts from all over India connected together through the summit to discuss the water security issues in India and of the world and to spread awareness about the importance of sustainable water management in present days scenario.


- **Awareness Programme on "Guidelines for Disposal of e-waste**"

  Internal Quality Assurance cell (IQAC), MRIIRS organized session on Awareness Programme on "Guidelines for Disposal of e-waste" on October 7,2023. The objective of this programme was to raise the awareness among the participants about the

responsible disposal of electronic waste to reduce the environmental and health consequences due to improper e-waste management. The session also emphasized on the procedure adopted by the university to dispose of the e-waste.

- **Pledge on 'Say No to Plastics'**

The Internal Quality Assurance Cell, ManavRachna International Institute of Research and Studies (MRIIRS) organized a pledge on "Say No to Plastics", on August 18, 2023. The aim of taking the pledge was to make students aware the detrimental effects of application of plastics to the society and well – beings.

6. WATER MANAGEMENT EDUCATIONAL OPPORTUNITIES FOR LOCAL COMMUNITIES (OUTREACH ACTIVITIES)

MRIIRS has established a center of excellence in April 2017 "Center for Advance Water Technology and Management" to outreach directly and demonstrate engagement initiatives to address the community's water management and water uses. The center is actively involved in achieving its vision "clean water for all and forever". The center had begun free "water literacy campaign" and conducting various inhouse and out campus activities for community education on water and hygiene, using ManavRachna FM Radio, organizing meetings, workshop/ seminar/ paining competitions, campus visit etc.

- **Promoting Conscious Water Usage on Campus and in the Wider Community**

To promote the conscious water use MRIIRS established MRCAWTM in April 2017 with the vision 'clean water for all forever". MRCAWTM organized Eco consult meet and other orientation programmes in-house, and for wider community several sessions on water literacy in campus and for civil society using ManavRachna FM Radio, organizing meetings, workshop/ seminar/ paining competitions, campus visit etc. MRIIRS offers courses in the curriculum covering the aspects of sustainable water management. The MRCAWTM promotes the conscious water use through its various activities.

- **Cooperation of MRIIRS with Local, Regional, National or Global Governments on Water Security:**

MRIIRS have developed cooperation on water security at local, regional and national level:

- MRCAWTM is having active coordination with Faridabad Smart City Ltd, Faridabad Municipal Corporation and Faridabad Metropolitan Development Authority in solving water issues of the city.
- MRCAWTM was awarded for its exemplary work in the revival of the Badhkal Lake in Faridabad, Haryana, India and for its commitment to promote awareness, and trigger action on critical water issues at all levels, including the highest decision-making level, to facilitate the efficient conservation, protection, development, planning, management and use of water in all its dimensions on an environmentally sustainable basis for the benefit of all life on earth.
- MRIIRS is working with Haryana Irrigation and Water Resource Department (IWRD) Panchkula in implementing AtalBhujalYojna Haryana as District Implementation Partner for Faridabad, Rewari and Palwal districts of Haryana State of India towards sustainable development of groundwater through participatory Ground Water management by formulating Gram Panchayat level Water Security Plan.
- MRCAWTM is also working with DST (Department of Science and Technology, Government of India) and has worked with National Institute of Urban Affairs funded research projects towards solving real time water security issues.
- MRCAWTM is also engaged in Hydrogeological surveillance of fresh water and saline water interface at various locations in India, including Barmer area of Rajasthan, Dholtapahar and NetrabandhaPahar (West) for Iron Ore Block, Sundergarh District, Odisha.
- MRCAWTM has also worked on Hydrogeological Investigation and Impact Assessment of for Dubiyara Iron Ore Mines, SihoraTahsil, Jabalpur District, Madhya Pradesh
- Impact assessment of underground mining of Manganese Ore on ground water in and around Miragpur, Balaghat Madhya Pradesh, India and Panderwani, Balaghat Madhya Pradesh, India

- **Radio Program on Responsible consumption of water**

Radio ManavRachna 107.8 FM created history in **Asia and India Book of Records** with **150 hours Non-stop Live Radio Program from June 29 to July 5, 2023 on UN's Sustainability Development Goals (**https://indiabookofrecords.in/a-marathon-radio-broadcast/**,** https://www.asiabookofrecords.com/longest-non-stop-live-

radio-show-on-sustainability/ **).** Following expert talks to educate local community on Water Management were delivered during this non-stop live radio program organized at MRIIRS. The details of these talks are as follows:

I. Ways of Water Conservation and its Need
   Resource Person: Dr. Arunangshu Mukherjee, Director MRCAWTM
II. Hygiene, Sanitation and Waste Management
   Resource Person: Mr. AshishJian, Founder and Director, Indian Pollution Control Association, Faridabad
III. Child Hygiene and Sanitation
   Resource Person: Ms. Varsha Daftuer, PRT Hindi, Manav Rachna Internationa School, Sec-14, Faridabad
IV. Concious Water Usage
   Resource Person: Ms.SnehaRai, Deputy Director MRCAWTM

- **Haryana Water Conclave 2023**

An open forum discussion in the form of **HARYANA WATER CONCLAVE 2023** was organized on 26-27 April 2023 at Panchkula under the aegis of Haryana Water Resources Authority (HWRA). Experts from various parts of India discussed issues like restoring water in river, reservoir and canals, effective strategies for ponds rejuvenation, protection of surface water quality, Impact of untreated grey water on environment, etc.

- **Visit of MRIIRS Water Sharks CLAN students in association with Department of Civil Engineering to the schools of adopted villages to spread awareness on water conservation and quality challenges**

The Department of Civil Engineering in association with Clan Watersharks, Department of Students Welfare organized a one-day visit to Senior Secondary School, PanheraKhurd. A group of 18 UG students from Civil Engg, Biotech and Mechanical Engg Departments along with Dr Sadiqa Abbas (Professor-Civil), Dr Anjali Gupta (Professor-Civil) and Mr HaobamDerit (Assistant Professor- Civil) visited the school. The visit was organized by Clan Water Sharks under the supervision of Clan Chief -WS Dr.PoojaKhurana and Clan Vice Chief Dr.ArvindDalal. The objective of this visit was to make school students aware about water conservation and quality challenges. Dr.Sadiqa Abbas and Dr Anjali Gupta along with other team members interacted with class 12th students and briefed them that water has become one of the most debatable resources of the future, whereas it is becoming limited and requires better and more cautious consumption in the future. They also explained about the water supply system for homes, estimation of water requirement for drinking and domestic use per person per day and rainwater harvesting. Furthermore, the students were asked to share their ideas to reduce water consumption. Students showed great zeal and enthusiasm in learning. Overall it was a good and motivating experience.

Media Coverage of efforts of ManavRachna CAWTM towards spreading Awareness among local communities for clean Water and Sanitation

जल पंचायत के माध्यम से महिलाओं को किया जा रहा जागरूक: वारिश खान

पलवल ■ मेट्रो मीडिया

अटल भूजल योजना के तहत जिला कार्यान्वयन भागीदार मानव रचना की टीम की अगुवाई में ग्राम पंचायत दुर्गापुर में गांव के लोगों से मिलकर उन्हें जागरूक किया तथा उन्होंने पुरुष और महिलाओं के साथ जल पंचायत का आयोजन किया, जिसमें गांव के लोगों ने काफी उत्साह के साथ भागीदारी ली। लोगों को जागरूक करते हुए आईईसी एक्सपर्ट गोविन्द माधव ने कहा की अगर इसी गति से जल का दोहन होता रहा तो वो दिन दूर नहीं जब लोगों को जल संकट का सामना करना पड़े।

उन्होंने कहा कि पुरुषों के साथ-साथ महिलाओं ने भी घरेलू कार्यों के लिए जिस तरह से जल का दुरुपयोग किया है उन्हें भी अपनी जिम्मेदारी समझनी होगी। जब तक लोग जल बचाने के लिए दैनिक व्यवहार में बदलाव नहीं करते तब तक पानी के व्यर्थ उपयोग को नहीं रोका जा सकता। जल की हर एक बूंद का उपयोग सही तरीके से होना चाहिए, ताकि हम आने वाली पीढ़ियों के लिए जल भंडार को सुरक्षित रख सकें, क्योंकि जल के ऊपर जितना अधिकार हमारा है उतना ही आने वाली पीढ़ियों का भी है।

अभिषेक और अशोक ने बताया कि किस तरह से लोग फसलचक्र को बदलकर जल को बचा सकते हैं, जिन फसलों को कम जल की आवश्यकता होती है, हमें उन फसलों की खेती पर जोर देना चाहिए। सिंचाई की विधि में बदलाव करके भी जल को बचाया जा सकता है, जैसे स्प्रिंकलर, ड्रिप पद्धति, अंडरग्राउंड पाइपलाइन जैसी विधियों का प्रयोग करके पानी के खर्च को कम किया जा सकता है।

उन्होंने कहा कि आज आपके पास जल की उपलब्धता है, इसलिए, आप सोच नहीं पा रहे हैं, लेकिन जब कल जल ही नहीं होगा तो लोग खेती ही नहीं कर पाएंगे। अमित और आकाश ने बताया कि किस तरह से रिचार्ज बोरवेल लगाकर जलस्तर को बढ़ाया जा सकता है। वाटर ट्रीटमेंट प्लांट लगाकर गांव के एकत्रित पानी को साफ करके खेती व अन्य कार्यों में प्रयोग किया जा सकता है।

गौरतलब है कि राहुल ने वाटर ट्रीटमेंट स्ट्रक्चर के लिए साइट इन्सपेक्शन किया। लोगों ने भी अपनी बातें रखते हुए गांव में रिचार्ज बोरवेल लगवाने की मांग रखी, क्योंकि यह क्षेत्र भूजल की समस्याओं से ग्रस्त है। यहां फसल को बरसाती मौसम में अधिक बारिश होने के कारण काफी नुकसान भी झेलना पड़ता है। वारिश खान सुकेडिया ने बताया कि जल पंचायत के माध्यम से महिलाओं को जागरूक किया जा रहा है।

हथीन क्षेत्र में टीकाकरण अभियान का शत प्रतिशत लक्ष्य हासिल करने के उद्देश्य से गांवों को 33 क्लस्टर में बांटा गया: एसडीएम हथीन

पुलिस ने 40 लीटर देसी कच्ची अवैध शराब के साथ दो आरोपियों को पकड़ा

जंगल में लकड़ी लेने गई महिला को सांप ने काटा

महिलाओं को जल पंचायत के माध्यम से किया जा रहा जागरूक: वारिश खान सुकेडिया

नुक्कड़ नाटक के माध्यम से लोगों को किया जा रहा है जागरूक -वारिश खान सुकेडिया

भूजल को बचाने के लिए ग्रामीणों को किया प्रेरित

नुक्कड़ नाटक के माध्यम से अटल भूजल योजना जागरूकता अभियान की शुरुआत : उपायुक्त

बल्लभगढ़ के ग्राम सिकरी व सीकरी के स्कूलों में बुधवार को हुआ कार्यक्रम।

Media Coverage of efforts of ManavRachna CAWTM towards spreading Awareness among local communities for clean Water and Sanitation

अटल जल कैंप के माध्यम से समुदाय को किया जा रहा जागरूक : वारिस खान सुकेडिया

अटल भूजल योजना के तहत जिले के सभी स्कूलों में चलाया जा रहा है जल जागरूकता अभियान

आजादी के अमृत महोत्सव पर हर घर जल बचाओ हर घर पेड़ लगाओ की पहल की

हथीन (हरीकेश कौशल्या)
देश की आजादी के 75 वर्ष पूर्ण होने के उपलक्ष्य में बृहद पैमाने पर मनाए जा रहे अमृत महोत्सव अटल भूजल योजना डीग्पी०एस०यू० पलवल ने जल संरक्षण को लेकर दूरगामी पहल की है। इस पहल से जुड़कर जिले के चार खण्डों की एक एक ग्राम पंचायत में कार्यक्रम किये गये हर घर पेड़ लगाओ व हर घर जल बचाओ एक अभियान चलाया गया जिसमें पाँच हजार पेड़ वन विभाग से लेकर गाँव आली मेव , कुकरचाटी , खाईका व नांगल सभा में वितरित किये गये कार्यक्रम में बच्चों ने काफी उत्साह से भाग लिया वे देश भक्ती गीतों पर अपनी परस्तुतीक दी व गाव के युवाओं के साथ पोधारोपन भी किया गया जलवायु परिवर्तन के दौर में जल संरक्षण समय की मांग है

इसी के दृष्टिगत एस०डी० श्री प्रमोद जैन अटल भूजल योजना (नोडल अधिकारी) हरियाणा के आदेशानुसार जल संरक्षण को आजादी के अमृत महोत्सव में एक खास अभियान के रूप में शामिल किया है ताकी अटल भूजल योजना के तहत समुदाय को जागरुक किया जा सके व अधिक से अधिक जल बचाने के लिये समुदाय के साथ पर्यास किए जा सके इसके तहत गांवों में पोखरों को अमृत सरोवर के रूप में विकसित कर जल संरक्षण की परिकल्पना को साकार किया जा रहा है व जिले के प्रत्येक खंड के एक एक गाँव में अटल भूजल योजना की तरफ से समुदाय के साथ मिलकर आजादी का अमृत महोत्सव मनाया गया ।

अमृत सरोवरों में सालभर जल की उपलब्धता बनी रहे, इसके इंतजाम भी किए जा रहे हैं.इन्हें मुख्यतः वर्षा जल संचयन कर भरा जाएगा. अमृत सरोवर के तट पर नीम, पीपल, कटहल, जामुन, बरगद, सहजन, पाकड़ और महुआ आदि के पौधे लगाए जा रहे हैं. अमृत सरोवर में गांव की नालियों का पानी न जाए, यह सुनिश्चित किया जाएगा। बारिश के जल का संरक्षण कर भूमिगत जल का रिचार्ज बढ़ाने में भी मदद मिलेगी. सरोवरों के तटबंध पर वाकिंग पथ बन रहे हैं. बैठने के लिए बेंच की भी स्थापना की जा रही है. सुबह-शाम सैर करने वाले ग्रामीण इसका प्रयोग कर सकेंगे और बच्चों को खेलकूद के लिए बढ़िया स्थान भी मिलेगा। जश्न ए आजादी पर ग्रामीणों को अमृत सरोवरों के संरक्षण का संकल्प भी दिलाया गया।

बारिश खान सूकेड़िया ने बच्चों को शील्ड देकर सम्मानित किया और जल संरक्षण के प्रति समझाया इस मोके पर आली मेव गाँव के सरपंच शकरलता , परधानाचार्य , मुबारक आली मेव , रफीक , राहुल , बुरहान व मौलना सहित अन्य मोजूद रहे

7. POLICIES OF MRIIRS FOR CONSERVATION OF ENVIRONMENTAL RESOURCES

- **Policy for E-waste management**

MRIIRS is committed to protect environmental resources such as water, plants, etc. by minimisation and proper management of the waste produced at the university. E-waste, a significant environmental concern, requires responsible management to minimize its adverse impacts on different habitats of earth. MRIIRS has a policy on E-Waste Management which comes under IT usage and maintenance policy. There is a standard operating procedure for the proper disposal of e-waste. This policy outlines our commitment to handling e-waste in an environmentally friendly and safe manner. To see the detailed policy **click here**

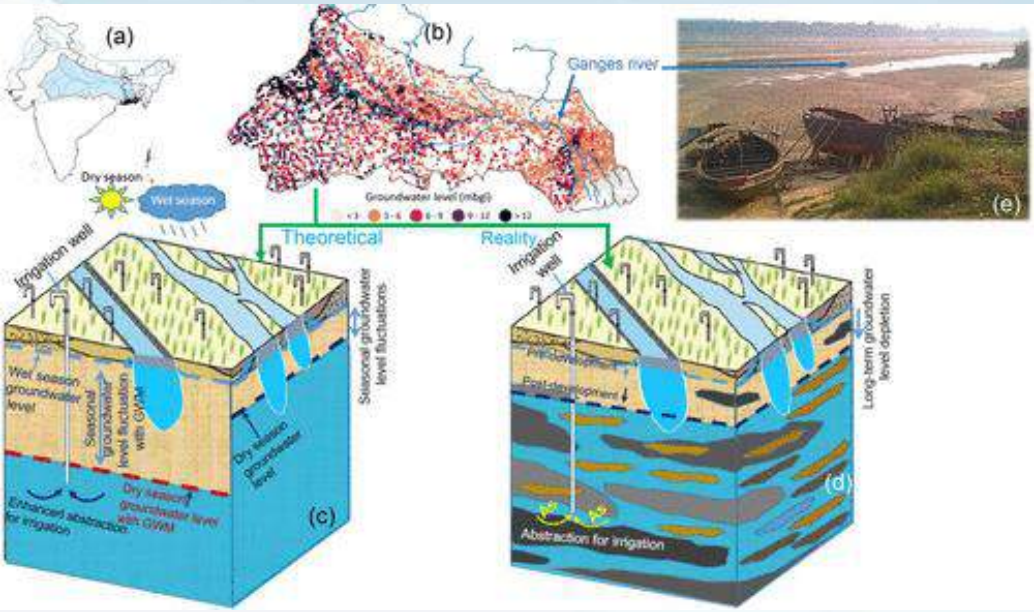
- **Green Policy for Plastic Usage and Plastic Waste Management**

The Green Policy of MRIIRS, Faridabad aims to institutionalize best practices for environment protection, natural resource conservation and sustainable development through a human– environment co-existence model. The MRIIRS community has consciously chosen to REDUCE, REUSE, RECYCLE, REPAIR and REPLACE the plastic and implement a ban on the 'single use plastics'. The policy mentions the standard operating procedure being followed at MRIIRS for Plastic Waste Management. To see the detailed policy **click here**

8. PROMINENT RESEARCH PUBLICATIONS ADDRESSING SDG 14

Contesting with the Ganges Water Machine in South Asia: Theory versus Reality - *https://doi.org/10.1021/acsestwater.3c00052*

Recently, the waterthere resources has been of the much Ganges interest River in Basinhow (GRB), to manage the cradle of Asian civilization, currently supporting >500 million people (Figure 1a). This also includes cleaning up the Ganges river, regarded as one of the most polluted mega-rivers of the world.1 Historically, the transboundary Ganges river and its tributaries, flowing through India, Nepal, and Bangladesh, have become extensively polluted and disrupted, mostly because of river engineering and increased discharge of industrial and urban waste. Compounding the problem, in the past few decades, intense groundwater abstraction from the GRB aquifers has led to unprecedented groundwater level depletion in some locations (Figure 1b). At present, the GRB groundwater levels are strongly influenced by depth-dependent abstraction, which is predicted to intensify in the future, given the increasing water demand. Thus, with impending climate change, designing the coupled river water–groundwater management necessary to meet the goal for sustainable access to clean water for a huge population, has become an arduous challenge.



Nano-composites for the removal of pharmaceuticals in drinking water sources - ***https://doi.org/10.1016/B978-0-323-99704-1.00019-9***

Water is one of the most important resources of universe. It is a basic need for human beings. About two thirds of the global population use safely managed drinking water services but millions of people use a drinking water sources contaminated with organic and inorganic pollutants and pathogens, such as surfactants, pesticides, aromatic hydrocarbons, heavy metals, fertilizers, bacteria, viruses, parasites, nitrates, phosphates, plastics, fecal waste, pharmaceuticals, and even radioactive substances. Many analytical techniques such as gas chromatography with mass spectrometry or tandem mass spectrometry and liquid chromatography with mass spectrometry or tandem mass spectrometry have resulted in detection to quantify both synthetic and natural pharmaceuticals at trace level in drinking water. Contaminated water can transmit diseases such as diarrhea, cholera, dysentery, typhoid, etc. Working group of experts of the World Health Organization added an issue to the work plan regarding the potential health impacts of residual concentrations of pharmaceuticals in drinking water.

Due to the cost-efficient removal technologies and exceptional characteristics of adsorption and reactivity, nanocomposites have been the subject of active research and development

worldwide in recent years. Numerous studies have shown that nanocomposites emerged to provide beneficial alternatives to remove various pharmaceuticals effectively in drinking water with higher rates. These are efficient for adopting the recommended strategies for the on-site removal of pharmaceutical contaminants from their effluents. The recommendations provided in this article will be useful with regard to adopting novel strategies for on-site removal of the emerging contaminants in pharmaceutical effluents and related industries using adsorption and photocatalysis. Keeping in view the applicability of nanocomposites for removal of pharmaceuticals, it is expected that this technique can be applied to treatment of a variety of waters and wastewaters for drinking purposes.

Hydrogeochemical evaluation with emphasis on nitrate and fluoride in urban and rural drinking water resources in western Isfahan province, central Iran

- https://doi.org/10.1007/s11356-023-30001-0

Nitrate (NO_3^-) and fluoride (F^-) are two major potential contaminants found in the groundwater of Iran. These contaminants are highly dangerous to humans if consumed more than the safe limit prescribed by the WHO. Therefore, in this study, the urban and rural drinking water resources of Isfahan province (central Iran) were investigated to evaluate the quality of groundwater from the perspective of NO_3^- and F^-. The calculated saturation index (SI) shows that the majority of samples are mainly undersaturated or in equilibrium with respect to potential minerals. The most likely interpretation for undersaturation with respect to most minerals is either that the minerals are not present if they are reactive or if they are present, then they are not reactive. This study reveals that the majority of the groundwater samples belong to the Ca-Mg-HCO_3 water type. Further, in this study, potential physicochemical variables have been used to calculate entropy weighted water quality index (EWQI). The EWQI reveals that the majority of the groundwater in the area is of good quality. Results show that the water chemistry in the area is largely governed by the water-rock interaction. This study based on large data sets reveals that the majority of drinking water resources are uncontaminated by F^-. However, the groundwater is found to be largely contaminated by NO_3^-. The bivariate plot suggests that the unscientific farming practices and overuse of manures and fertilizers are largely responsible for high content of NO_3^-. Therefore, emphasis should be given on the cost-effective environmentally friendly fertilizers. The findings from this study will aid the governing

authorities and concerned stakeholders to understand the hydrogeochemical evolution of groundwater in this region. The results will help formulate policies in the area for sustainable water supply.

Integration of Microalgae-Based Wastewater Bioremediation–Biorefinery Process to Promote Circular Bioeconomy and Sustainability: A Review - *https://doi.org/10.1002/clen.202100407*

Bioremediation of wastewater using microalgae is inexpensive, energy efficient, and effective in pollutant reduction as compared to conventional wastewater treatment technologies. Wastewater is a huge resource of minerals, nutrients, bioenergy, and valuable organic compounds and can be used for cultivation of microalgae. The microalgal biomass can be further used as biorefinery feedstock to produce biofuels and commercially important high-value products. The potential of microalgae toward bioremediation and biorefinery applications presents the avenues for integrating the two processes to support circular bioeconomy and sustainability. This review presents a holistic view of integration of bioremediation and biorefinery processes using microalgae for deriving multiple benefits like pollutant removal, resource recovery, biofuel production, and generation of high-value commercial products. The current status of high-throughput microalgal screening technologies is also discussed since the selection of suitable microalgal strains is crucial for the application. The review further summarizes various processes involved in bioremediation and biorefinery systems such as cultivation, bioremediation, harvesting, and downstream processing. Recent trends in microalgal strain improvement for bioremediation and biorefinery applications through genetic engineering, bioinformatics, omics technologies, and genome editing tools are highlighted, while addressing the risks, biosafety issues, and regulatory affairs associated with genetically modified algae.

9. REGULAR SKILL SET ENHANCEMENT AT MRIIRS- CERTIFICATIONS EARNED BY STUDENTS/FACULTY MEMBERS

As a testament to our unwavering dedication to skill development and our keen alignment with Sustainable Development Goal 14 (SDG 14), we proudly showcase a catalogue of certifications earned by our faculty members and students in areas that address the critical preservation and sustainable use of our oceans and marine resources. These certifications

stand as a testament to our commitment to nurturing the talent and expertise needed to contribute to a sustainable future, especially in the realm of ocean conservation. A sample certificate is attached below:

Certificate No: ICT/1647/21-22

National Institute of Technical Teachers Training and Research, Chandigarh

MINISTRY OF EDUCATION, GOVERNMENT OF INDIA

Certificate

This is to certify that

Dr. JIMMY MEHTA

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES, FARIDABAD (HARYANA)

Participated in AICTE recognized Short Term Course

on

Water Resource Management through ICT

conducted by

Civil Engineering Department

from

07.03.2022 *to* ***11.03.2022*** **(One Week)**

at

Manav Rachna International Institute of Research and Studies, Faridabad (Haryana)

Coordinator

Director

MANAV RACHNA
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A++ NAAC

Manav Rachna International Institute of Research and Studies

(Deemed to be University under section 3 of the UGC Act,1956)

Manav Rachna Campus Rd, Gadakhor Basti Village, Sector 43, Faridabad, Haryana 121004