

6.5

Water in the Community

6.5.5 Cooperation on Water Security

MRIIRS Weblink to SDG 6:

<https://mriirs.edu.in/sdg06-clean-water-and-sanitation/>

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.
- ✓ MRIIRS is working with Haryana Irrigation and Water Resource Department (IWRD) Panchkula in implementing Atal Bhujal Yojna 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.

As evidence in support to 6.5.5 Letter of Approvals, agreements, reports with pictures, NOC etc, exists. All the data are available in public domain through, newspaper & web site of MRIIRS.

**Report
On
Cooperation of MRIIRS with Local Government on Water
Security**

Cooperation of MRIIRS with Local Government on Water Security:

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.

- A. Co-solving of Water Logging and Ground Water Depletion Issues in Sector 15A of Faridabad City of Haryana State of India**
- B. Detailed investigation report for Rain Water Harvesting in Khoh Village in Manesar, Haryana, India.**
- C. Report on Feasibility of Revival of Badkhal Lake at Faridabad City, Haryana, India.**

The detailed work done and till date progress is as outlined in the following section.

A. Co-solving of Water Logging and Ground Water Depletion Issues in Sector 15A of Faridabad City of Haryana State of India

MRIIRS with the funding of Department of Science and Technology, Government of India, has created rainwater recharge structure at **officer's colony, sector 15A Faridabad, Haryana, India** for water co-solving logging and groundwater depletion as a pilot project and with the hope to replicate it in entire city area.

A.1 Introduction

Urban waterlogging and groundwater depletion are two diverse but major challenges of Indian cities under changing climatic conditions. The enhanced extreme events of rainfall in recent years along with rapidly altered hydrological conditions in urban environment pose conducive situation for urban water logging. On the other hand, intense and large withdrawal of groundwater, higher than the natural annual recharge has depleted the groundwater level severely in many Indian cities. A pilot project is executed in Faridabad Smart City of National Capital Region India, to combat water logging and to rejuvenate groundwater resource.

In the study all steps were undertaken meticulously, beginning from hydrogeological study, site selection, rainfall analysis, calculations of runoff generation, framing well design after identification of suitable recharge zones within depleted aquifer and determination of its intake capacity. It further elucidates estimation of suitable dimension of desilting chamber, fixing suitable dose of ferric chloride for coagulation and assessment of recharge volume. The constructed recharge system is tested whether it is working effectively as per the feedback obtained from independent sources. It has high scalability in similar hydrogeological situation in other parts of India.



Picture of Actual Waterlogging in the Officer's Colony Area of Sec-15A, Faridabad City of Haryana State of India

A.2 Details of Project:

The project of 36 months duration with 0.7012 crore budget, submitted with the title **“Co-solving water logging and groundwater depletion issues in parts of Faridabad Smart City using Underground Taming of Flood Water for Aquifer Storage and Recovery”** to the Department of Science and Technology, Government of India, got sanctioned to Manav Rachna CAWTM in May 2021.

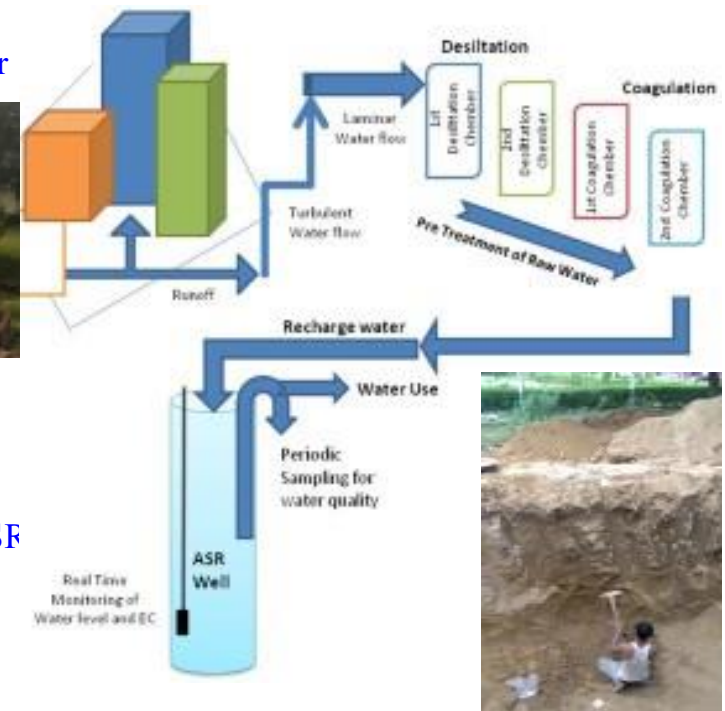
- Under this investigation it was proposed to divert the urban flash flood creating water logging condition and is hampering day-to-day life during monsoon period to improve the groundwater condition within the depleted aquifer. This **aquifer**

storage and recovery project of taming urban flood water is addressing two critical issues of urban hydrology to improve the sustainability.

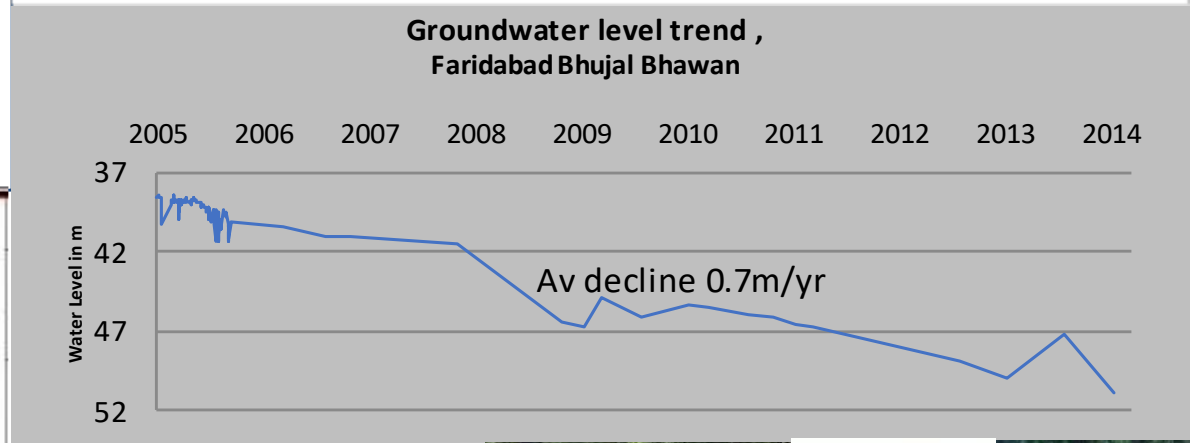
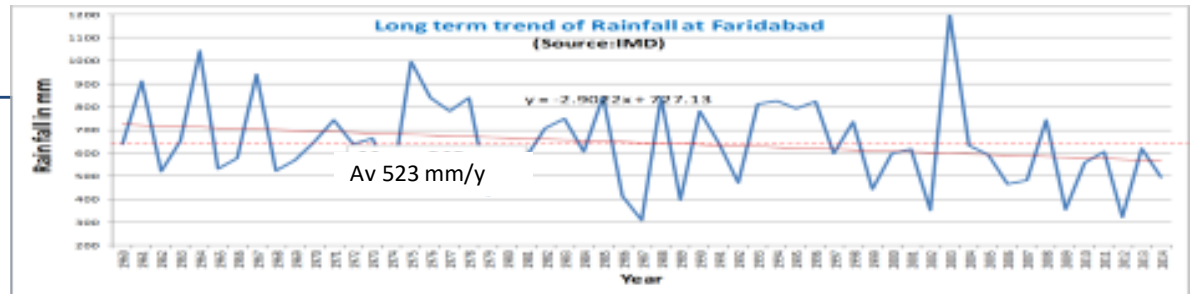
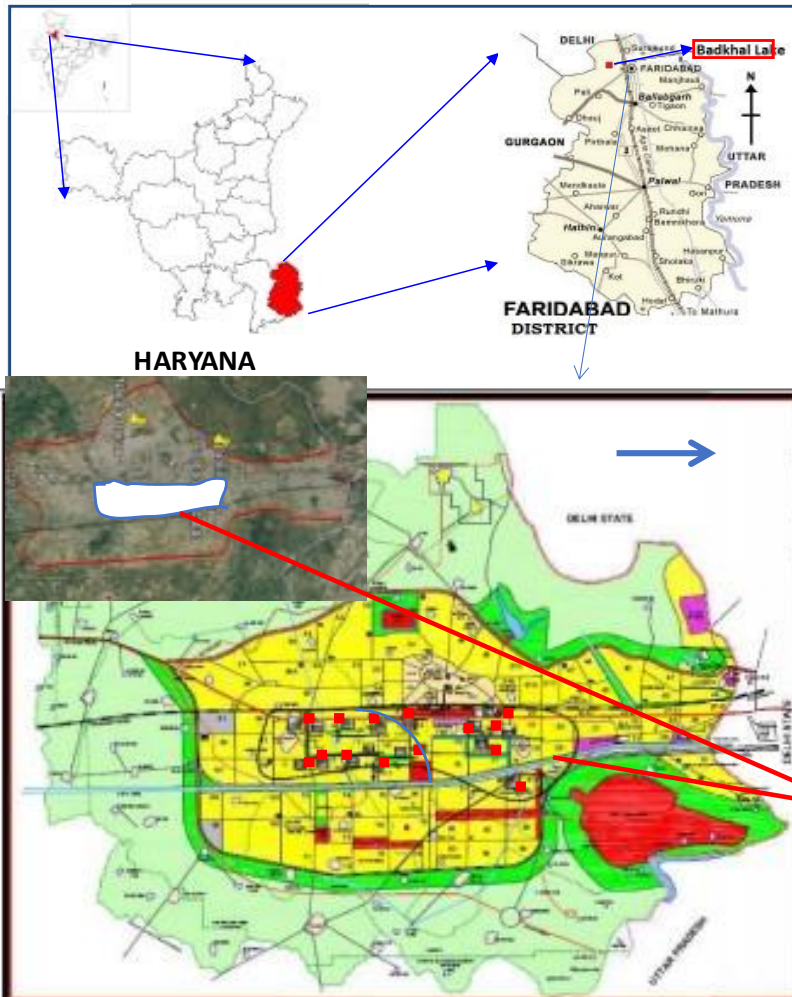
- ✓ Developing solutions to the street water logging and groundwater depletion through Underground Taming of Flood water (UTF) for Aquifer Storage Recovery (ASR) in Faridabad Smart City.
 - ✓ Identification of suitable aquifer zones for recharge in the Faridabad Smart City
- **Impact Assessment:** Under this sponsored project, MRIIRS with the funding of Department of Science and Technology, Government of India, has created rainwater recharge structure at officer's colony, sector 15A Faridabad, Haryana, India for water co-solving logging and groundwater depletion as a pilot project and with the hope to replicate it in entire city area.
 - ✓ Real time monitoring of groundwater level, temperature, and electrical conductivity for impact assessment on the ground water system.
 - ✓ Periodic monitoring of groundwater quality to assess the impact of Aquifer Storage and Recovery through comparison of the source water and product water.
 - ✓ To study the reduction in energy consumption for groundwater pumping due to UTF & ASR
 - Project Investigators: Dr. Arunangshu Mukherjee (Principal Investigator- PI)
Dr. Nidhi Didwania (Co- PI)
Ms. Alifia Ibkar, Research Assistant
 - **Capacity Building for Replication:** Capacity building of Urban Local Body (ULB) officials such as Municipal Corporation Faridabad (MCF), Haryana Shehri Vikas Pradhikaran (HUDA) & Faridabad Smart City Limited (FSCL) etc related to Underground Taming of Flood water (UTF) for Aquifer Storage Recovery (ASR).

Co-solving Water logging and Groundwater depletion issue in parts of Faridabad S using Underground Taming of Flood water for Aquifer Storage and Recover

- Topographic survey and DGPS elevation mapping of the area of interest
- Micro level hydrological and hydrogeological study for designing for UTFW during pre monsoon and monsoon period
- Surface geophysical Investigations VES & Profiling
- Study for construction of connecting drain, desiltation chambers, coagulation chamber
- Experiments for selection of suitable Iron based coagulant
- Study for Optimization of flow rate and dosing of coagulant
- Auger hole drilling and slug testing- Vadose zone study
- Drilling of bore hole and litho sampling
- Subsurface geophysical logging
- Well completion and development
- Pumping test for aquifer characterization and well efficiency test
- Collection and analysis of groundwater samples for base level data acquisition
- DWLR with EC and Temp sensor and installation
- Installation of UTFW system by connection civil construction and drilled well for ASF
- Installation of energy meter and pump
- Water sampling for analysis of regular and emerging pollutants /contaminants
- Impact assessment of UTFW



Faridabad Smart City



Faridabad Area-187Km²
Population- 16 lakh
Water logging area-17Km²
Effected population~3lakh
Present av DTW+40mbgl





Construction of Structures for Co-solving of Water Logging and Ground Water Depletion Issues in Officer's Colony, Sector 15A of Faridabad City of Haryana State of India



Inspection of site - Officer's Colony, Sector 15A of Faridabad City of Haryana State of India



Constructed Structure at Officer's Colony, Sector 15A of Faridabad City of Haryana State of India

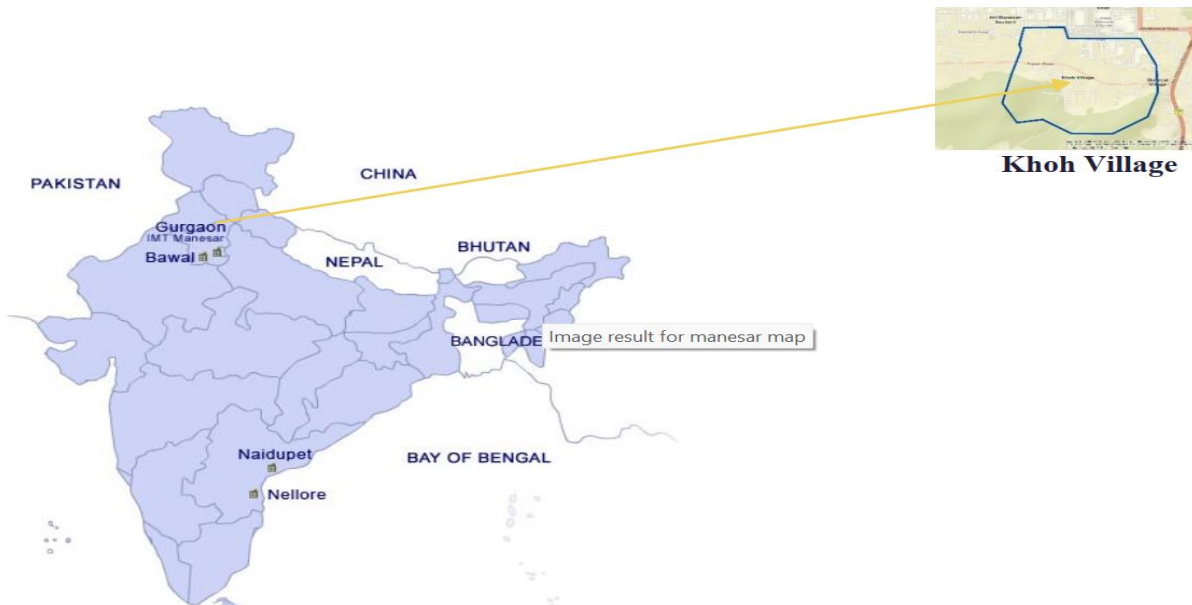
Media Coverage:



- ✓ The Project sanction order by Department of Science and Technology is appended.
- ✓ NoC by Faridabad Smart City Limited for Construction of Structures.

B. Detailed investigation report for Rain Water Harvesting in Khoh Village in Manesar, Haryana, India

Village Khoh (76 55' 44"; 28 21' 15") is situated in the northern parts of foot hill zone of residual Aravali hill near Manesar, where the hill is having steep slope.



To improve the sustainability and availability of water in the area the Maruri Suzuki Foundation (MSF) under CSR activity initiated the work. A MOA was signed among MSF and Manav Rachna International Institute of Research and Studies (MRIIRS) to take up a detailed investigation in the village area assigning following scope of work:

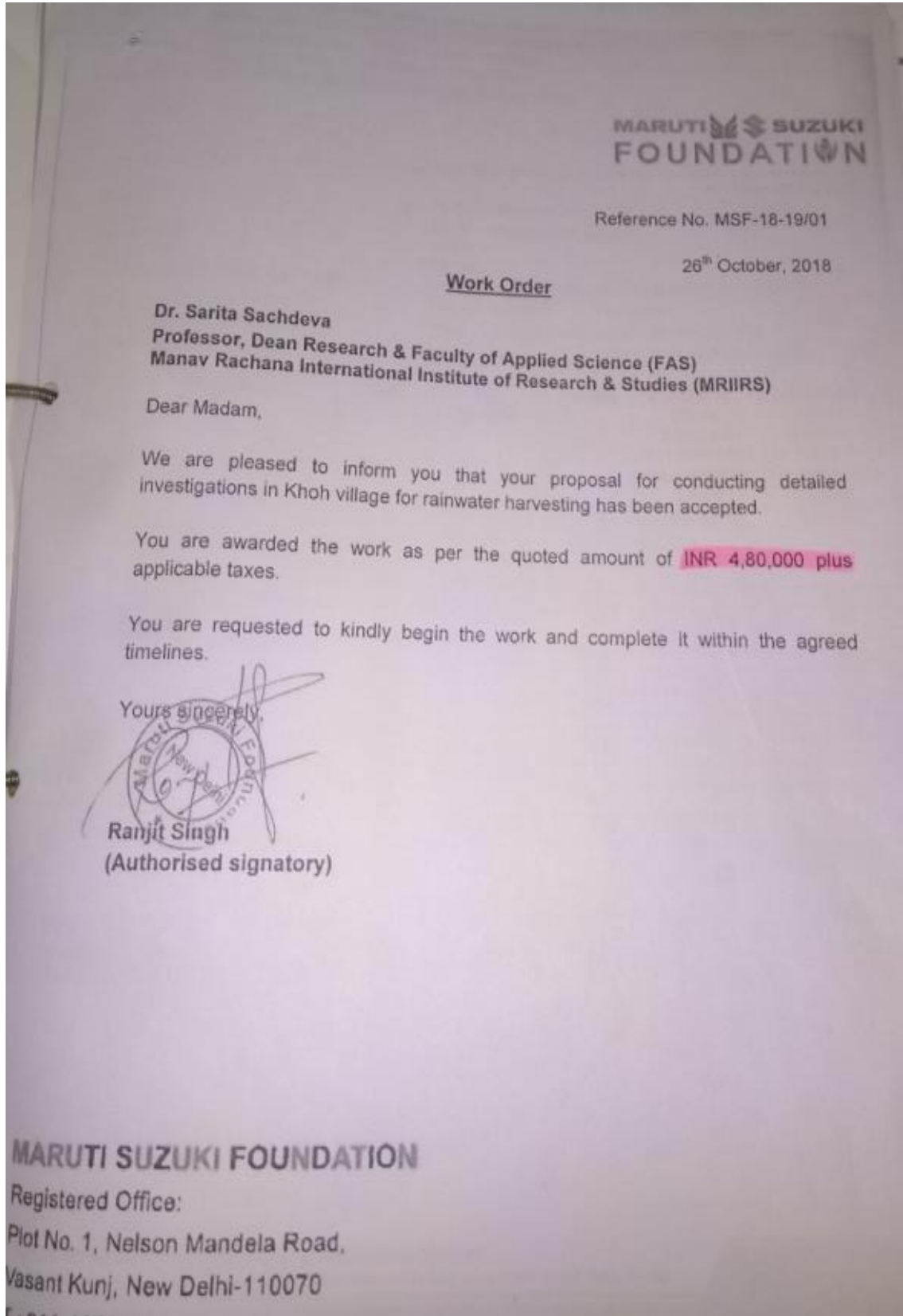
- Data collection- Meteorological, Geological, Hydrological, hydrogeological Remote Sensing-GIS investigations
- Groundwater inventory in post monsoon & water budgeting of the village
- Water & Soil quality analysis- testing
- Geophysical Investigations for locating community water well site & Artificial Recharge sites
- Pond hydrological studies for revival Study of Plantation along hill slope – Survey, tests and recommendations &
- Preparation of overall Investigation report of project

Accordingly, CAWTM, MRIIRS investigated the area of Khoh village appreciating the significance of Integrated Micro Watershed Management for:

- ❖ Improvement in water security, ecology & livelihood by increasing water availability
- ❖ Data collection- Meteorological, Geological, Hydrological, hydrogeological, Remote Sensing GIS investigations
- ❖ Groundwater inventory in post monsoon & water budgeting of the village
- ❖ Geophysical Investigations for locating community water well site & Artificial Recharge sites
- ❖ Improvement in happiness level among

- ✓ The Work order to carry out this project and detailed investigation Report on the work carried out by Manav Rachna CAWTM on Rain Water Harvesting in Khoh Village is appended.

Work Order for KhoH Village Work:



C. Report on Feasibility of Revival of Badkhal Lake at Faridabad, Haryana, India

During a National Workshop held at Manav Rachna to address Water Conservation and Pollution, a major concern was shown on the drying up and receding water levels of the Badkhal Lake- once a major Tourist attraction of Faridabad City, Haryana.

- ✓ A series of thoughts were discussed and as an outcome, the project on Pre-feasibility Study of Revival of Badkhal Lake was assigned to the Manav Rachna Centre for Advanced Water Technology and Management (MRCAWTM).
- ✓ The detailed study was carried out by the team of scientists of MRCAWTM and the **consolidated submitted report for the same is appended.**

Media Coverage:

<https://tennews.in/report-on-revival-of-badkhal-lake-finalised-national-workshop-held-at-manav-rachna-to-address-water-conservation-and-pollution/>



MANAV RACHNA EDUCATIONAL INSTITUTIONS



INITIATIVE

REVIVAL PLAN OF BADKHAL LAKE



- The Badkhal lake situated in the backyard of Delhi in the foot hill of Aravali was once a tourist hot spot. The lake gradually lost its water and by the year 2006 the lake became dry.
- The reduction in surface run-off in the catchment of Badkhal lake is mainly due to change in catchments behavior. The desaturation of aquifer has adversely affected the runoff generation within the catchment.
- Proper treatment of catchment by construction of sub surface dyke perpendicular to strike lineaments and watershed management can help in restoring and reviving the lake.
- In addition, for sustainable water impoundment suitably treated domestic waste water and collected storm water need to be pumped to the lake on regular basis.

- Treatment of Badkhal Catchment
- Mining activity is impact to Badkhal catchment, flow to the Badkhal lake reduced to almost negligible, construction of subsurface dykes and check dam can provide some resources for lake sustainability. Detail study for optimization of structures to use the runoff is essential - Data not available - Recommended for investigation.
- Impoundment of treated wastewater
- Available in large quantity near to the Badkhal Lake, Treatment technologies are available to treat the wastewater to the required quality standard, will provide sustainability even under climate change. Recommended for implementation.
- Total annual quantity of evaporation-ML: 688
- AVERAGE DAILY MAKE UP OF WATER IN ML: 1.86 Based on the projections given above the average daily requirement of makeup water in Badkhal is: 1.88MLD. The peak requirement is 3.3MLD and the minimum requirement is 0.67MLD.

Norms for Reuse of reclaimed water

- To create wetlands, enhance natural wetlands, or sustain stream flows.
- Water Quality Parameters should -not to exceed: ≤30 mg/l BOD ≤ 30 mg/l TSS ≤ 200 fecal coliform/100 ml-1 mg/l Cl2 residual (min.)
- Monitoring-
- BOD – weekly, SS – daily, Fecal coliform – daily, Cl2 residual – continuous

Composition of available source water

- Composition of available source water
- Total Suspended Solids: 308.0 mg/l
 - Biochemical oxygen Demand (BOD) at 27°C – 3days: 129.6 mg/l
 - Chemical Oxygen Demand (COD): 478.2 mg/l
 - Phosphorous: 2.1 mg/l
 - Total Kjeldahl Nitrogen (as N): 9.2 mg/l

Location of STP-

- Considering the present disposal of wastewater from different areas near to the Badkhal Lake, the most suitable site for installation of STP seems to be in Sector 21, adjoining to pump house.

Technology options for Wastewater Treatment

Need to consider the following aspects:

1. Source of wastewater
2. Available quality of wastewater
3. Quality parameters required of treated wastewater
4. Technology options
5. Capacity of plant
6. Location of treatment plant

SOURCE WATER

In computing the capacity, it is also important to take into consideration losses as a result of evaporation from the exposed surface and also the seepage losses of the unlined bottom of the lake. It is estimated that to fill the lake upto 6m covering an area of 30.4ha the total quantity works out to be 10 MLD. Considering the evaporation and seepage losses to be 2.63 MLD, the balance available would only be 7.37 MLD. It will take about 300 days for the lake to be filled up to level of 6m and to become an operational tourist spot.

Exposed surface area of water (sq. m) if lake is filled to 6m	304300
Total volume of water in Lake (cu.m)	1825980
Required loss due to percolation into the ground (annually)	12%
Quantity of water lost annually due to percolation (cu.m)	221120
Quantity of water lost annually due to percolation (MLD)	251.87
Average Quantity of water lost daily due to percolation (ML)	0.79
Average Quantity of water lost daily due to evaporation (ML)	1.88
TOTAL DAILY REQUIREMENT OF WATER	2.67

	Make up water required (MLD)	Water required to fill lake to 6m	Total annual requirements	Annual production from a 10MLD Recycling Plant(MLD)	Surplus available for other applications (MLD)
Year 1	900	1825.8	2785.8	3600	714.2
Year 2	900	0	900	3600	2700
Year 3	900	0	900	3600	2700

CONCLUSION

Target will thus be achieved.

Badkhal lake can be revived by being its glory back. The option for source water is treated waste water. Based on comparative study of treatment technologies, use of MBR and EBAS is suggested. Location of proposed STP is sector 21C of 10 MLD. Total water requirement to fill the lake up to 6m depth in an area of 30.43 ha is about 1825 ML. The base of lake should be kept unlined and watershed treatment is to be done.

MANAV RACHNA EDUCATIONAL INSTITUTIONS INITIATIVE REVIVAL PLAN OF BADKHAL LAKE



ABOUT BADKHAL LAKE

- The lake was constructed in early 1950s as a minor irrigation project in the foothills of Aravalli of Faridabad area.
- The bund was erected by joining two hills to arrest a fourth order stream at Badkhal village.
- The lake site gradually became a major attraction of eco-tourism.
- The lake is has a catchment area of 1025 ha and the initial area of submergence was 42 ha, water used to irrigate 600ha.
- Subsequently the flow to the lake began reducing gradually and by the year 2006 the lake became dry.
- Which adversely effected the hydrological environment, the ecology of the area and the tourism of Badkhal area.



Google Earth Image of Badkhal Lake for different periods

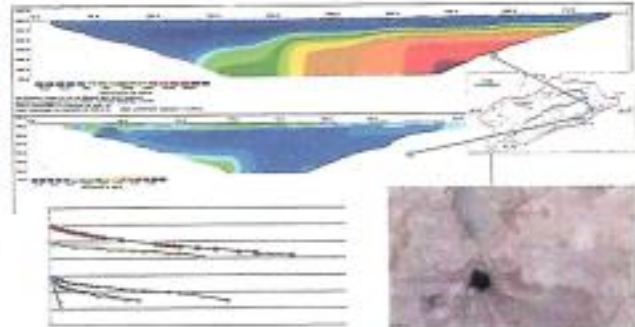
BADKHAL LAKE CATCHMENT



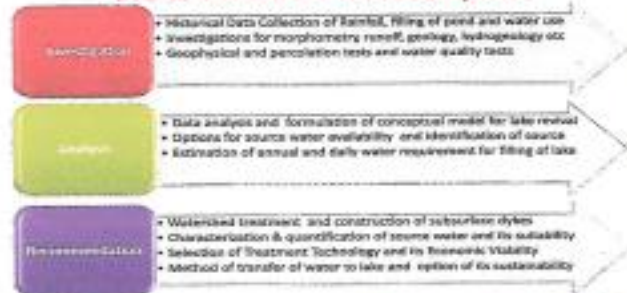
Proposed Subsurface Dykes



SNo	Subsurface Dyke code	Subsurface Dyke location	Annual GW conservation in NICM/yr
1	SSD 1	Near Bund towards Ankhir	0.619
2	SSD 2	West of Bund towards Institute	0.367
3	SSD 3	Near Akhada side of D2W	1.15
4	SSD 4	Near Temple away from SSD1	1.059
	Total		=3.4MCM/yr



Flow Chart of Revival plan



**Report
On
Cooperation of MRIIRS with Regional Government on
Water Security**

Cooperation of MRIIRS with Government on Water Security at Regional Level:

MRIIRS is working with Haryana Irrigation and Water Resource Department (IWRD) Panchkula, Haryana, India in implementing **Atal Bhujal Yojna 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.

Atal Bhujal Yojana is to demonstrate community-led sustainable ground water management which can be taken to scale. The major objective of the scheme is to improve the management of groundwater resources in select water stressed areas in identified states. It is a community-centric program and emphasizes the importance of community understanding, preparation and ownership of their water security plans. The Atal Bhujal Yojana which is implemented in seven water stress states of India, including Haryana, is funded by **Govt. of India and World Bank**. 14 water stress districts of Haryana are in target under Atal Bhujal Yojana. MRIIRS, MRCAWTM has been engaged by Atal Bhujal Yojana Haryana as **District Implementation Partner (DIP)** for 7 blocks of 3 districts (Faridabad, Palwal and Rewari) under two clusters:

A. Cluster 6: for District Faridabad and Rewari

B. Cluster 7: for District Palwal

Under this initiative it has been envisaged the preparation of **community led** Gram Panchayat level **Water Security Plan** and ensuring its implementation through **convergence** of various government programs for 296 Gram Panchayats. The main objective of this program is to restore or revive the groundwater scenario in the targeted villages in participatory approach. This involves supply side and demand side management of water through various intervention, behavioral changes, awareness and improved water use efficiency. The project involves strengthening of infrastructure for measurement and monitoring and capacity building of community level managers. The program is of 4 year duration started in July 2021 and expected

SDG 6- CLEAN WATER AND SANITATION



to complete by June 2025. Total budget provision for this work allocated for MRIIRS is Rs. 7.78 crore.



ATAL BHUJAL YOJANA HARYANA

अटल भुजल योजना हरियाणा

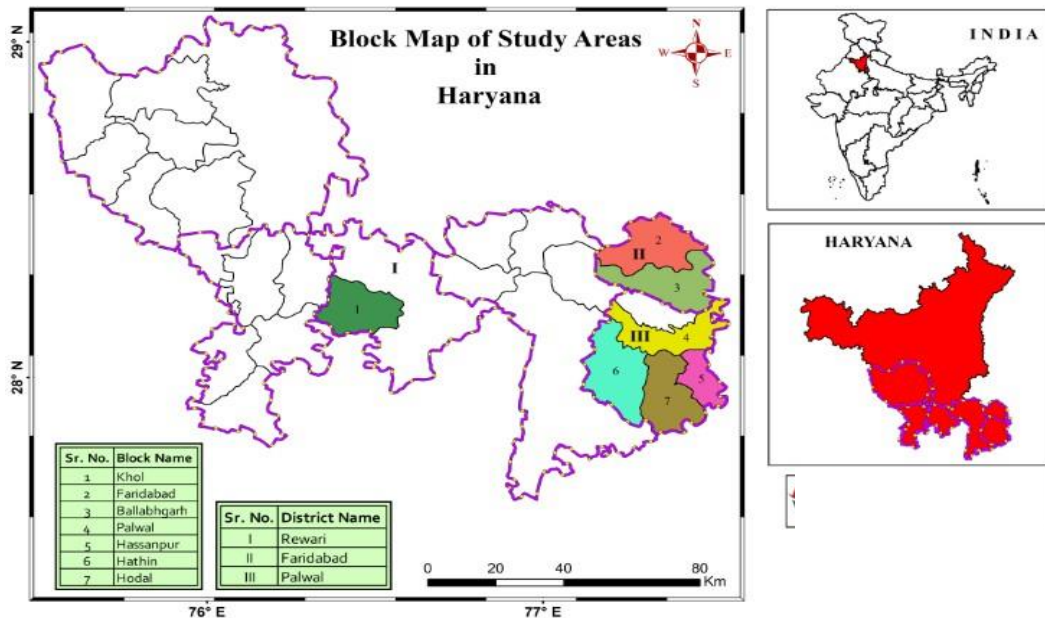


Engagement of MRIIRS as DIP for Faridabad, Rewari and Palwal district

TWO PROJECTS

Sanction No . **ABY/2122/26w/95 2- 956**
District Implementation Partner Cluster-06(Faridabad Rewari Districts)
Duration 48 months, Budget 290.37lakh

Sanction No . **ABY/2122/27w/95 7- 961**
District Implementation Partner Cluster-07(Palwal District)
Duration 48 months, Budget 483.96lakh



SDG 6- CLEAN WATER AND SANITATION



2. ATAL BHUJAL YOJANA

- A Central Sector Scheme, Funded by World Bank, Implemented by Mo Jal Shakti GOI in association with State Govt.
- Implemented in 7 states- MP, UP, KN GJ, RJ, MH & Haryana.
- Groundwater over exploited districts are in target
- 14 districts of Haryana included covering 36 block and 1895 GP
- Manav Rachna is involved in three districts- Palwal, Rewari and Faridabad as DIP (District Implementation Partner). Working in 296 GPs

Progress

- Inception Report, work plan and Base line Reports of both the clusters submitted.
- Quarterly Reports for periods July-Sept 2021, Oct- Dec 2021 and Jan- March 2022 of both clusters submitted.
- Water Security Plans of 41+72 GP of Palwal, 18GP+25 of Faridabad and 05+19 GP of Rewari district submitted in three rounds in Oct 2021 Jan 2022 and March 2022 respectively
- Accompanied the DPMU, SPMU, RO, QCI and NPMU authorities in field who visited separately all the three districts for field level inspections of work carried out by the DIP-MRIIRS.
- WSPs for 8GP of Fbd and 15GP of Palwal approved in 1st round and others are under approval
- Attended meetings with the DCs, Nodal officers, RO and Block level officers in all 3 distt.
- Conducted capacity building of >200 VWSC members of 20 GPs for Fbd and Ballabhgarh
- Convergence planning and field level inspection carried out with department of Forest, Panchayati Raj, Irrigation-MICADA and Soil conservation.
- School level painting competition conducted under ABY jointly with CGWB Chandigarh.



ATAL BHUJAL YOJANA

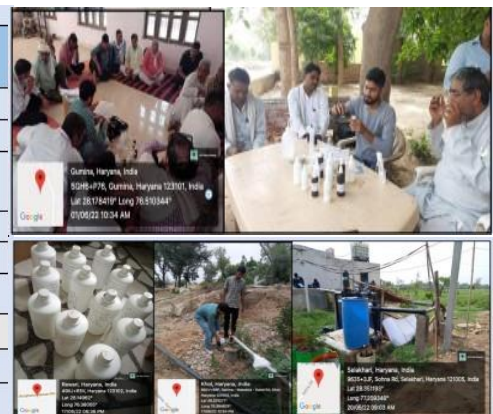
ANNUAL PROGRESS OF CLUSTER-07 PALWAL



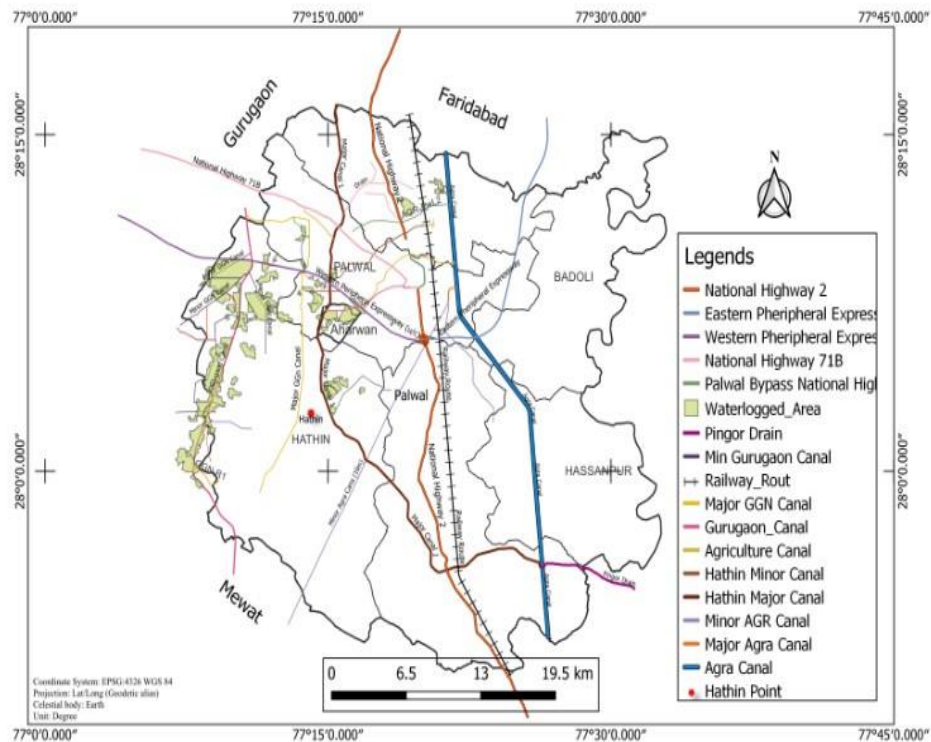
S. N	Progress on WSP preparation in cluster 07 (Palwal)	Palwal	Hodal	Hathin	Hassanpur	TOTAL
1	Total GPs selected block wise	41	34	75	35	185
2	Target of WSP till June 22	41	34	75	35	185
3	WSP approved till March	6	18	28	20	72
4	WSP approved till December	20	5	16	0	41
5	WSP uploaded on MIS during the quarter (Apr-June 22)	15	11	31	15	72
Quarterly WSP Submitted						
1st Quarter		2nd Quarter		3rd Quarter		4th Quarter
16		25		72		72

ANNUAL PROGRESS OF CLUSTER-06 FARIDABADREWARI

S. N	Progress on WSP preparation in cluster 06 (Fbd- Rewari)	Faridabad	Ballabhgarh	Khol	TOTAL	
1	Total GPs selected block wise	30	41	40	111	
2	Actual Target	28	41	39	108**	
3	WSP approved upto December (Jan-Mar 22)	11	14	19	44	
4	WSP approved upto December	8	10	5	23	
5	WSP uploaded till June 2022	9	17	15	41	
**Deducted 2 from Faridabad block and 1 from Khol block, Rewari.						
Quarterly WSP Submitted						
1st Quarter		2nd Quarter		3rd Quarter		4th Quarter
8		15		44		41



Water Logging Map of Hathin Block, Palwal district, Haryana



The detailed work done and till date progress of both clusters A and B is appended with the following inclusions:

A. Cluster 6: for District Faridabad and Rewari

- ✓ **Letter of Acceptance**
- ✓ **Inception Report**
- ✓ **Progress Report**
- ✓ **Compiled Details**

B. Cluster 7: for District Palwal

- ✓ **Letter of Acceptance**
- ✓ **Inception Report**
- ✓ **Progress Report**
- ✓ **Compiled Details**

Report
On
Cooperation of MRIIRS with National Government on
Water Security

The theory of sustainability gained momentum and is linked now with community resilience. The concept of resilience is common in term of disaster and climate change. It is hence imperative that MRIIRS should work in the direction of establishing sustainable resilience community. **Manav Rachna Centre for Advance Water Technology and Management**, MRIIRS is actively involved in projects which target sustainable resilience.

Cooperation of MRIIRS with Government on Water Security at National Level:

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.

- A. **Hydrogeological Studies for Aquifer Monitoring in Barmer Area, Rajasthan, India**
- B. **Faridabad Urban WASH (Water, Sanitation and Hygiene) Lab Project**
- C. **Communicating Science Through Model Water & Eco Health Clinic for Quality of Life**
- D. **Engagement as State Implementation Support Agency (SISA) to support in Jal Jeevan Mission (JJM)**
- E. **Impact assessment of underground mining of Manganese Ore on GW in and around Miragpur, Balaghat MP and Panderwani, Balaghat MP**

The detailed work done and till date progress is as outlined in the following section.

A. Hydrogeological Studies for Aquifer Monitoring in Barmer Area, Rajasthan, India

“Hydro Geological Survey for Aquifer Monitoring in Barmer Area, Rajasthan” with contract value of INR Rs 2.28 Crores, from Cairns Oil & Gas Vedanta Limited in order to evaluate that the abstraction of deep saline aquifer is not impacting the available fresh water resource in the area. (Contract No 4600008827, Block RJ-ON - 90/1) 1st july,2021 to 24

Hydrogeological surveillance of fresh water and saline water interface at **Barmer area** of Rajasthan funded by CAIRN – Vedanta Oil & Gas Pvt. Ltd. CAIRN Oil and Gas use saline water for increasing oil production. For which they withdraw huge quantity of saline water from deeper aquifers of Barmer area developed within the **cenozoic faulted basin**. There exists fresh to blackish water aquifers at

shallow depth and is being used by local farmers for to meet domestic and irrigational requirements.

MRCAWTM through more than 1000 observation point covering nearly 5800 km² area monitor groundwater level and quality and collect various dynamic and static well and aquifer data. Keep vigilant eye on groundwater development so that impact if any due to withdrawal of saline water on shallow blackish water/ fresh water lenses can be observed. Thus, maintaining the sustainability of domestic/ irrigation water in part of Thar Desert. This project is of long-term duration. The 1st phase of three-year duration completed in May 2021 and the 2nd phase for further three-year duration is going on since July 2021. The budget provision for the first phase was Rs. 1.678 crore and that of 2nd phase is Rs. 2.28 crore.



MANAV RACHNA
Ividyaparikshah

CAIRN Oil & GAS, VEDANTA LIMITED
has awarded a prestigious
Consultancy Project on

**Hydrogeological Survey for
Aquifer Monitoring at Barmer, Rajasthan**

to the
**Centre for Advance Water Technology & Management
at MRIIRS**

Aquifer monitoring program of Barmer area to study possible impact on freshwater zone due to developing saline aquifer for hydrocarbon extraction by CAIRN Oil and Gas Vedanta Ltd.

- Area of investigation: 5860 km² of Thar *Desert, Including parts of Barmer and Jallor districts, Raj.*
- *Hydro census Frequency: Twice a year.*
- *Per census: 40 days activity,*
- *Data collection points :975.*
- *Water sampling points: 100. Vehicle movement about 0.17lakh km By VTS tracer.*

Aquifer monitoring program of Barmer area to study possible impact on fresh water zone due to developing saline aquifer for hydrocarbon extraction by CAIRN Oil and Gas Vedanta Lt d.

Project duration :3.0 Yrs , Status: Ongoing

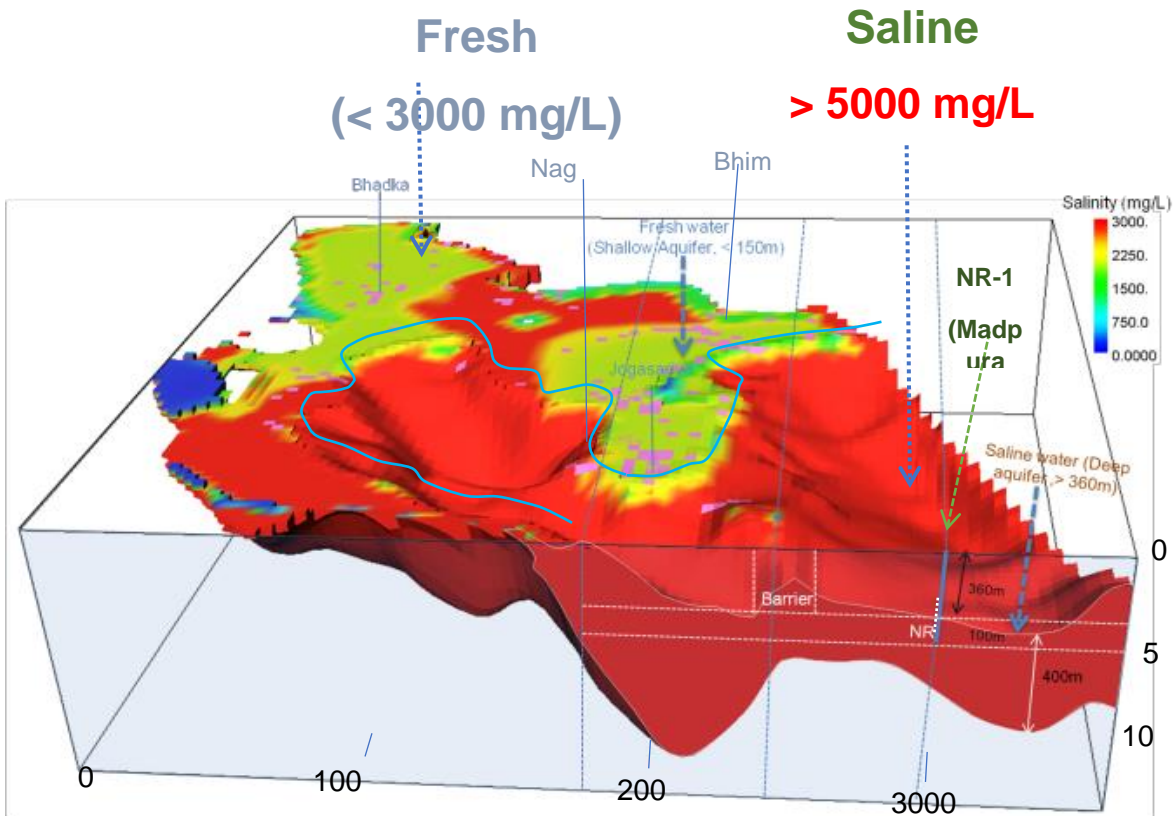
Area of investigation : 5860 km² of Thar Desert, Including parts of Barmer and Jallor districts, Raj.
Hydro census Frequency: Twice a year

Per census: 40 days activity, Data collection points :1005. Water sampling points: 105. Vehicle movement about 0.17lakh km By VTS tracer



Groundwater Monitoring Study in Barmer





Volumetric of Saline Water Resources in Aquifer at Thumbli Village, District Barmer, Rajasthan, India

- ✓ **The contract of Hydro Geological Survey for Aquifer Monitoring in Barmer Area, Rajasthan” with contract value of INR Rs 2.28 Crores, from Cairns Oil & Gas Vedanta Limited in order to evaluate that the abstraction of deep saline aquifer is not impacting the available fresh water resource in the area. (Contract No 4600008827, Block RJ-ON -90/1) 1st july,2021 to 24 is appended.**

Update on the Project Approval:

https://twitter.com/manav_rachna/status/1410839135112241154

B. Faridabad Urban WASH (Water, Sanitation and Hygiene) Lab Project

Municipal Corporation Faridabad (MCF), National Institute of Urban Affairs (NIUA), and Manav Rachna International Institute of Research and Studies (MRIIRS) signed a Tripartite Agreement to establish a WASH (Water, Sanitation and Hygiene) Lab at Manav Rachna Campus. The Advanced Water Technology & Management Centre of Excellence has been allocated Wash Innovative Lab supported by USAID involving a funding of Rs. 20 lakhs to undertake various activities pertaining to water.

<http://www.todaybhaskar.com/wash-lab-will-be-established-in-manav-rachna-university/>

<https://manavrachna.edu.in/latest/mcf-mriirs-and-niua-sign-a-tripartite-agreement-in-the-area-of-water-sanitation-and-hygiene-wash/>

- ✓ NIUA has implemented Innovation Hub for Urban Water, Sanitation, Hygiene Solutions (IHUWASH) project that is duly funded by the United States Agency of International Development (USAID). A joint initiative of NIUA, TARU Leading Edge, IRC and Ennovent, this project is aimed to improve the performance of urban WASH programs with a collaborative framework. The IHUWASH project is being implemented in the Faridabad, Mysuru, Udaipur cities. The overarching goal of the project is to improve the urban WASH service delivery system by sourcing and accelerating innovative solutions.
- ✓ Considering the importance of academia and innovation in this aspect, Manav Rachna International Institute of Research and Studies is committed to sharing the available knowledge to improve the services for the citizens of the Faridabad and contribute to the betterment of the society. Additionally, the project is also expected to create an ecosystem that fosters innovations, and encourage entrepreneurship in the WASH sector.
- ✓ Under this initiative, a WASH Innovation Lab has been set up at Manav Rachna campus to institutionalize a self-sustainable WASH advisory support mechanism for MCF and Government of Haryana, in order to build an ecosystem for WASH innovations in Faridabad, extending to Haryana.

The objective of the establishment of WASH Lab at Manav Rachna is to provide advisory support to MCF in WASH sector; create partnership with private entities and

industries to ensure sustainability of WASH innovation Lab beyond the Agreement Tenure; conduct training, workshops, capacity building program to enhance capacity of government officials in implementing WASH Innovations in urban areas and thereby achieving goals of SBM, AMRUT and SCM more effectively; and carry out evidenced based research to improve designs of WASH infrastructure and systems.

- **A consultation workshop on WASH** (Water, Sanitation and Hygiene) forum was held at MRIIRS. It was jointly organized by the WASH Innovation Lab at MRIIRS, Municipal Corporation of Faridabad and National Institute of Urban Affairs.

https://twitter.com/manav_rachna/status/1115560171005251585

<https://manavrachna.edu.in/latest/press-release-consultation-workshop-on-wash-forum/>



- **Participation at WASH Innovation Summit:** Dr. Sarita Sachdeva, Dean Research, MRIIRS presenting her thoughts on Catalyzing Innovative WASH solutions through Partnerships

<https://insights.eletsonline.com/2018/11/catalyzing-innovative-wash-solutions-through-partnerships/>



SDG 6- CLEAN WATER AND SANITATION

Dr. Sarita Sachdeva, Professor, Manav Rachna International Institute for Research and Studies, Faridabad

Dr. Sarita Sachdeva began with a brief overview of the WASH challenges of Faridabad, such as unavailability of safe drinking water and sanitation facilities. Although Faridabad is in close proximity to the national capital; the WASH standards of the city are below average causing worry to the citizens. She appreciated the partnership concept of the WASH Lab; an initiative implemented under the IHUWASH project and mentioned the need of more such initiatives in the city. She highlighted that one of the important aspects of the WASH Lab is capacity building programs and assessment workshops, which enables a system of getting feedback from the stakeholders. WASH Forums created under the WASH Lab will also facilitate a multi-stakeholder platform; where issues and challenges of residents, industries and other stakeholders in the city will be addressed. She mentioned that the capacity building programs of the WASH Lab will help many enthusiastic city engineers to avail training on addressing issues in WASH Sector.



Dr. Sarita Sachdeva

FARIDABAD

With the support of Municipal Corporation Faridabad (MCF) and WASH Lab at Manav Rachna International Institute of Research & Studies (MRIIRS) an awareness program was organized at Govt. Girls Senior Secondary School, No.5, NIT Faridabad. The theme for competitions was 'Clean Hands - A recipe for Good health'.

Sensitized:

- 350 students along with 10 school teachers and 4 municipal officials.
- 126 participated in various competitions.



Participants of Global Handwashing Day at Government Girls Senior Secondary School, No.5, NIT Faridabad



Drawings prepared by the participants of the Competition

- **Capacity Building Programme for Municipal Corporation officials by WASH Lab under IHUWASH Project**

<https://egov.eletsonline.com/2018/12/capacity-building-programme-for-municipal-corporation-officials-by-wash-lab-under-ihuwash-project/>

The objective of the workshop was to map and assess WASH issues that are prevailing in the city which need to be addressed. There was also requirement to facilitate the ongoing processes and activities of Municipal Corporation of Faridabad (MCF) towards effectively improve urban WASH situation in Faridabad. This interactive workshop was attended by 43 representatives from various stakeholders' agencies and key players including RWA, industries, NGOs, academia, State and Central Government organisations, private agencies and all the three partners NIUA, MCF and MRIIRS. The event was convened by WASH Chair Dr DK Chadha.



Supporting Documents:

- ✓ The agreement of setting up of WASH Lab at MRIIRS is appended.
- ✓ MRIIRS has marked its presence in WASH Innovation Summit, the detailed report is also appended.

C. Communicating Science Through Model Water & Eco Health Clinic for Quality of Life

A series of activities were conducted for Conscious Water Usage under the funded project of Department of Science and Technology on 'Communicating Science Through Model Water & Eco Health Clinic for Quality of Life'.

Supporting Documents:

- ✓ **Sanction Order of funded project of Department of Science and Technology on 'Communicating Science Through Model Water & Eco Health Clinic for Quality of Life'.**
- ✓ **Booklet as compiled and distributed on 'Eco and Water Facts'.**

D. Engagement as State Implementation Support Agency (SISA) to support in Jal Jeevan Mission (JJM) with contract value of INR Rs 47,52,000/- from Public Health Engineering Department (PHED) State Government, Haryana, Memo No 13419 dated 28th September 2021 to 2022. (Tendor No: 2021_HRY-178043_1).

Jal Jeevan Mission is an ambitious project taken by the Govt. of India to ensure achieving the Sustainable Development Goal SDG-6, where functional tap connection has to be provided to each individual household of rural India. The project has been adopted by Haryana State and MRCAWTM, MRIIRS has been engaged as **State Implementation Support Agency (SISA)**. The main role of SISA is to assess PHED the nodal agency for Jal Jeevan Mission Haryana in achieving its objective of JJM. The SISA assess PHED as technical support organization in capacity building, infrastructural strengthening and source finding for suitable quantity and quality of water. The appointment of SISA is initially for 1 year and extended for one more year, started in October 2021 with an annual budget of Rs. 50 lakhs. MRCAWTM is providing technical support for sustainability of water resources in both the above projects.



**SISA – State Implementation Support Agency
Under Jal Jeevan Mission**



**Duration 12 Months
Budget 48.24 lakh**

- ❖ Jal Jeevan Mission Haryana is envisioned to provide safe and adequate drinking water through individual functional household tap connections (FHTC) by 2022 to all households in rural Haryana.
- ❖ The program is also implementing source sustainability measures as mandatory elements, such as recharge and reuse through grey water management, water conservation, rainwater harvesting.
- ❖ As SISA MRCAWTM is assisting state program management unit of JJM in selection of suitable ISA, monitoring & evaluation of performance of ISA, planning and execution IEC activities under JJM and working as knowledge partner to JJM

Jal Jeevan Mission- Directorate at MRIIRS





- The MRCAWTM is working as **knowledge partner** to JJM.
- The MRCAWTM has **appointed 03 experts** as SISA expert team at PHED Panchkula, comprising of 02 Training & Capacity Building Experts and 01 Water Domain Expert ,initially **for 01 year**.
- The MRCAWTM has **Established JJM (SISA) Directorate at MRIIRS** by engaging one **full time expert** to extend support in the working of SISA through facilitating conduct of capacity building , mass awareness , source finding and sustainable development of drinking water sources. Faculties of MRIIRS are contributing in the working of **JJM (SISA) Directorate** .

E. Impact assessment of underground mining of Manganese Ore on GW in and around Miragpur, Balaghat MP and Panderwani, Balaghat Madhya Pradesh, India

- ✓ Geological, Remote Sensing, Hydrogeological, Geophysical, Geochemical and Socioeconomical investigations completed.
- ✓ Draft reports submitted after investigation.
- ✓ Reply submitted to CGWA on query
- ✓ Report approved

WORKS UNDER CGWA ACCREDITATION



Consultancy under Accreditation from CGWA- Pandharwani Mine and Miragpur Mine Balaghat MP – Two Projects		M/s D P Rai	31.01.2022 3 months
Sl. No.	Activity completed/ taken up	Budget	4.0lakh
1	Workorder obtained for study based on our quotation		
2	Field visit to Balaghat MP by Sandeep and Alifia for collection of data from field on Groundwater		
3	Inspection visit by Ms Sneha Rai and Dr Arunangshu Mukherjee conducted to Balaghat and Nagpur for discussions and planning		
4	Outsourcing of RS-GIS work and Geophysical Investigation done, and data obtained, and analysis of data conducted		
5	Report for both the mine area SUBMITTED		

Comprehensive Report on:
Groundwater Condition in both core and buffer zone of Miragpur Manganese Mine, Khairlanji Block, Balaghat District, Madhya Pradesh

[Report submitted for obtaining NOC form CGWA under Section 5 of the Environment (Protection) act, 1986 (29 of 1986) as per the new notification no 2943 of 24th Sept 2020]

Admin : M/s D P Rai, Nanhka, 10 East High Court Road, Ramdaspet, Nagpur- 440010 Maharashtra, Ph. No 7122522724, Email id: dprai.mines@gmail.com

Comprehensive Report on:
Groundwater Condition in both core and buffer zone of Pandharwani Manganese Mine, Khairlanji Block, Balaghat District, Madhya Pradesh

[Report submitted for obtaining NOC form CGWA under Section 5 of the Environment (Protection) act, 1986 (29 of 1986) as per the new notification no 2943 of 24th Sept 2020]

M/s D P Rai, Nanhka, 10 East High Court Road, Ramdaspet, Nagpur- 440010 Maharashtra, Ph. No 7122522724, Email id: dprai.mines@gmail.com

March, 2022
By MRCAWIM