

No. ABY/2122/26w/952-956

Date: 04/08/2021

To:

Ms/ Manav Rachna International Institute
of Research and Studies, Faridabad,
Head Office, 5E/1-A, Bungalow Plot,
N.I.T. Faridabad, Haryana 121004
Email Id:- arunangshu.fet@mriu.edu.in

Subject: -

Letter of Acceptance for the work of "Engagement of District Implementation Partner to support in Implementation of Atal Bhujal Yojana Atal Jal for Cluster-06 District Faridabad Rewari, Blocks Khol, Faridabad, Ballabhgarh" (Tender ID:-2021_WBIRR_162978_6)

This is to notify that your Bid for "Engagement of District Implementation Partner to support in Implementation of Atal Bhujal Yojana Atal Jal for Cluster-06 District Faridabad Rewari, Blocks Khol, Faridabad, Ballabhgarh" for the Contract Price Rs. 29037600/- (Rupees Two Crore ninety Lakh thirty seven Thousand six Hundred only) for the period of 48 months for 111 Nos. Gram Panchyat (GPs) as corrected and modified in accordance with the Instructions to Bidders is hereby accepted.

You are requested to furnish Performance Security, in the form detailed in Clause 19.3 for amounts of Rs. 871128/- It is requested to visit this office and sign the contract with submission of Performance Security, failing which action as stated in ITB Clause 45.2 will be taken.

D/A: - Copy of Approval of rates

Executive Engineer/Atal Jal
Irrigation & W.R. Department
Haryana, Panchkula.

Copy to:

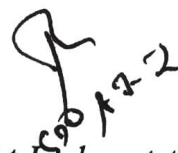
1. Chief Engineer/LCU, Irrigation & Water Resource Department Haryana, Panchkula for information Please.
2. Sub Divisional Officer/Atal Jal-1 for information necessary action.
3. Sub Divisional Officer/Atal Jal-2 for information necessary action.
4. DAO/Atal Jal for information Please.

No.
To

05 /ABJ/2021

Dated:- 04/08/2021.

✓ The Executive Engineer/ Atal Jal,
Irrigation & Water Resources Department,
Haryana, Panchkula.



Subject: Approval of rates for the work of "Engagement of District Implementation Partner to support in implementation of Atal Bhujal Yojana (Atal Jal) for Cluster-06 Districts: Faridabad, Rewari (Blocks Khol, Faridabad & Ballabhgarh)".

Kindly refer to your office U.O. No. 916/ABY dated 03.08.2021 on the subject cited above.

2. The tender for the subject captioned work was put up in the meeting of Department High Powered Purchase Committee held on 22.07.2021 under the chairmanship of Sh. Manohar Lal, Chief Minister, Haryana. After deliberation, the Committee has finalized the tender in the favour of "M/s Manav Rachna International Institute of Research and Studies, Faridabad" for a total consideration of Rs. 2,90,37,600/- inclusive of all taxes. Accordingly, description of item, quantity & total amount are approved as under:-

Description of item	Qty.	Total Amount
Engagement of District Implementation Partner to support in implementation of Atal Bhujal Yojana (Atal Jal) for Cluster-06 Districts: Faridabad, Rewari (Blocks Khol, Faridabad & Ballabhgarh)	One Lot	Rs. 2,90,37,600/- (Rs. Two crores ninety lakhs thirty seven thousand six hundred only)

The above approval is subject to the following conditions: -

1. Change of name of the Company/Agency: During the period of tenure, if the name of the company/agency has undergone a change due to acquisition, amalgamation etc., the company/agency shall inform the Department within one month. In such cases, all the obligations under the contract with the Department should be passed on for compliance to the successor company.
2. The services and deliverables by the selected Agency must ensure compliance to relevant e-Governance Policy Accessibility guidelines and all other relevant standards and guidelines published by Govt. of India or Govt. of Haryana as may be applicable from time to time.
3. Force Majeure: For the purpose of this clause, 'Force Majeure' shall mean an event that is unforeseeable, beyond the control of the parties and not involving the parties' fault or negligence. Such events may include acts of the Government either in its sovereign or in its contractual capacity, war, civil war, insurrection, riots, revolutions, fire, floods, epidemics, quarantine, restrictions, freight, embargoes, radioactivity and earthquakes. The Agency shall not be liable if the delay in the discharge of its obligations under this agreement is the result of an event of Force Majeure as defined above.






Continue at Page ...2..

{Engagement of District Implementation Partner to support in implementation of Atal Bhuiat Yojana (Atal Jal) for Cluster-06 Districts: Faridabad, Rewari (Blocks Khol, Faridabad & Ballabhgarh)}

4. If a Force Majeure situation arises, the empanelled Company/Agency shall promptly notify to the concerned department in writing of such conditions and the cause thereof. Unless otherwise directed by the concerned department in writing, the empanelled Company/Agency shall continue to perform its obligations under this Agreement, as far as it is reasonably practical and shall seek all reasonable means of performance not prevented by the Force Majeure event.
5. Deployment of Manpower:- Selected Agency should be responsible for the deployment of manpower within the 15 days from the signing of the contract.
6. Replacement:- Any Staff/Personnel of The Manpower providing Agency, found misfit or indulging into indiscipline Act or found medically unfit shall be immediately removed henceforth and immediate replacement (with departmental Approval within 10 days) accordingly shall be made by Agency, at the same time at no extra cost.
7. Penalty: If the Selected agency fails to deploy the all manpower within 15 days after the signing of agreement, the penalty shall be imposed @1000/- per day on each resources.
8. Agency will be responsible for any replacement (after first deployment) within 10 days otherwise @1000/- per day on per resources will be imposed.
9. If the Bidder fails to provide CVs and staff with required qualification and experience then the bid will be treated as non-responsive.
10. Bidders are encouraged to engage Community mobilizers/Volunteers to assist in project implementation at village levels.
11. If any of the staff/experts are not found suitable for the designated task/post as mentioned above; then the employer will have every right to demand for replacement and the Agency (DIP) shall replace the same with the competent ones, within a month of receipt of letter from the employer.
12. Agency will not replace any of the specialists except extreme circumstances.
13. The above approval is subject to the conditions that all codal & accounts formalities required under the rules/guidelines/instructions issued by the competent authority, should be followed and all terms & conditions laid in DNIT & Bidding Document be also adhered to strictly.
14. *If any discrepancy is noticed in the above approval, matter may be referred to this office for rectification before entering into agreement, immediately.*


Superintendent,
for Project Director/ABJ, I&WR Deptt.,
Haryana, Panchkula.


04/07/2021



**Manav Rachna International
Institute of Research and Studies**
(Deemed to be University under section 3 of the UGC Act 1956)
**Manav Rachna Centre for Advance
Water Technology & Management (CAWTM)**



सिंचाई एवं जल संसाधन विभाग
हरियाणा

**INCEPTION REPORT,
WORK PLAN & BESE LINE REPORT**
Cluster-06 Faridabad-Rewari

By District Implementation Partner (DIP):
Manav Rachna International Institute of Research and Studies MRIIRS

Submitted to: The EIC/ LUC Cum Project Director,
ATAL BHUJAL YOJANA (ATAL JAL)



INDEX OF REPORT: CLUSTER 06 (FARIDABAD & REWARI)

CHAPTER NO.	CONTENT	PAGE NO.
1. Introduction		1-8
	A. Brief Note on cluster background	
	B. Brief note on Atal Bhujal Yojana	
	C. Role and Responsibility identified for DIP	
	D. Brief history of DIP Organization	
	E. Institutional set up of DIP Team	
2.1 District wise ground water profiling: FARIDABAD		9-16
	A. Geomorphology	
	B. Water resource profile- surface, ground water, rainfall and traditional source	
	C. Hydrogeology	
	D. Groundwater resources	
	E. Groundwater quality	
	F. Status of ground water development	
	G. Sectoral utility scenario	
	H. Trend in utility and resource development	
	I. Key management challenges	
	J. Prospective water management approach	
2.2 District wise ground water profiling: REWARI		16-22
	A. Geomorphology	
	B. Water resource profile- surface, ground water, rainfall and traditional source	
	C. Hydrogeology	
	D. Groundwater resources	
	E. Groundwater quality	
	F. Status of ground water development	
	G. Sectoral utility scenario	
	H. Trend in utility and resource development	
	I. Key management challenges	
	J. Prospective water management approach	
3.1 District livelihood scenario: FARIDABAD		23-24
	A. Sectoral dependency of various forms of livelihood	
	B. Temporal trend in livelihood form	
3.2 District livelihood scenario: REWARI		
	A. Sectoral dependency of various forms of livelihood	
	B. Temporal trend in livelihood form	
4. Water Security Plan: Approach and Method		25-34
	A. Institutional flow for preparation of WSP	
	B. Methodology for preparation of WSP	
	C. Data gathering tools	
	D. Process flow and protocols	
	E. Scope of scheme incorporation	
	F. Scope of institutional incorporation including village level traditional institution	
	G. Strategy for WSP implementation	
	H. Convergence strategy of the schemes	
	I. Scope and plan for adaptation of water efficient practices	
	J. Work plan for preparation and implementation	
	K. GP wise baseline (attached in Annexure-I)	
	L. Comprehensive management plan	

Annexure-I

1. INTRODUCTION

A. Brief note on cluster background:

For Atal Bhujal Yojana, Haryana has been divided into 9 clusters and for these cluster 5 DIPs were engaged. Centre for Advance Water Technology and Management, Manav Rachna International Institute of Research and Studies (MRIIRS) through tender has been selected as District Implementation Partner (DIP) under Atal Bhujal Yojana (ABY) for cluster 06 (Faridabad, Rewari) and letter of LOA has been issued vide LOA No. ABY/2122/26W/952-956 dated 04.08.2021 and same was accepted and signed on 11.08.2021 for Atal Bhujal Yojana. The ABY project duration is for 48 months and performance security for the same as per clause 19.3 for amount of Rs. 871128 has been deposited. Cluster 06 includes Faridabad (30), Ballabgarh (41) and Khol (40) blocks incorporating 111 Gram Panchayat (table 1.1). These districts are located in and around NCR in SE part of Haryana. (Fig 1.1)

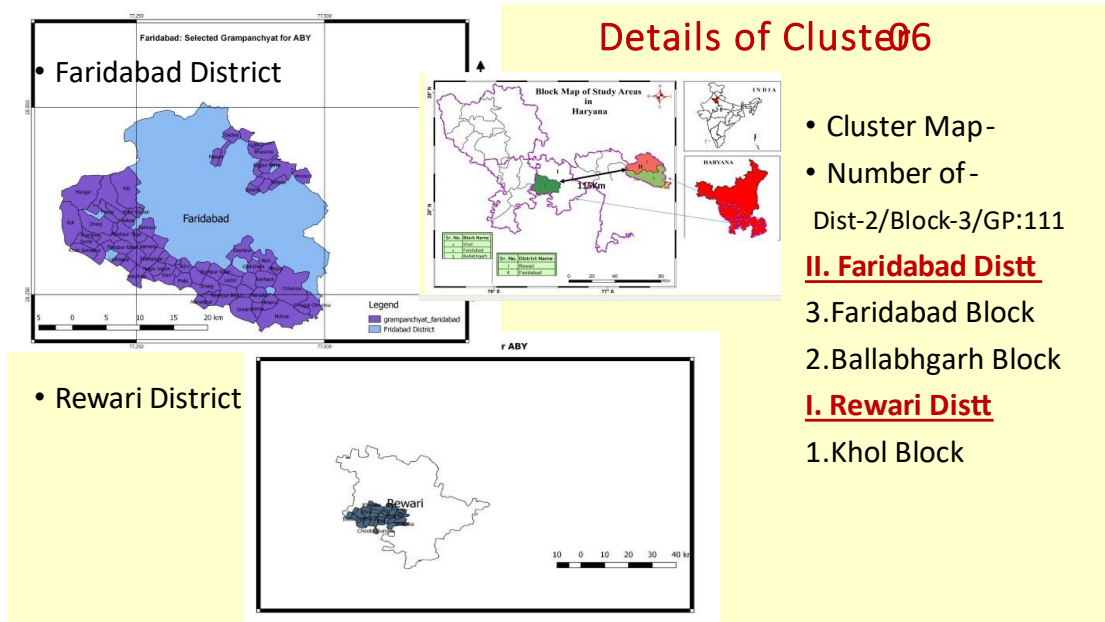


Fig 1.1 Location Map of cluster 06

SN	DISTRICT	BLOCK	GPs	Remarks
1	Rewari	Khol	40	Khol and Faridabad is 115km apart
2	Faridabad	Faridabad	30	
		Ballabgarh	41	
TOTAL			111	

B. Brief note on Atal Bhujal Yojana:

Department of Water Resources, RD & GR (MOWR RD & GR), Ministry of Jal Shakti is implementing Atal Bhujal Yojana (Atal Jal) with World Bank assistance in select water-stressed areas of seven States of the Country viz., Gujarat, Haryana, Karnataka, Madhya

Pradesh (MP), Maharashtra, Rajasthan and Uttar Pradesh (UP). The scheme is designed to facilitate sustainable management of groundwater in a holistic manner by involving the concerned Central and State Government machinery, PRIs, NGOs, WUAs, Farmers and other stakeholders. In view of the multi-disciplinary nature of the scheme and involvement of grass root level stakeholders in the scheme implementation, District Implementation Partners (DIPs) are engaged. Atal Bhujal Yojana was launched by Hon'ble Prime Minister Shri Narendra Modi on 25.12.2019 for a period of 5 years. In Haryana 36 blocks of 14 districts is included under Atal BhujalYojna comprising 1669 Gram Panchayat. These blocks were selected based on status of Ground Water extraction. The main objective of this project is to develop **Sustainable groundwater management through participatory approach** and for this, two components were identified:

- Institutional strengthening and capacity building
- Development of incentive disbursement linked indicators

The unique feature of Atal BhujalYojna is aimed at

- Behavioural change at ground level
- Promote demand site management
- Bottom-up approach of planning
- Incorporates principle of challenge method

Four-pronged strategy has been adopted for Atal BhujalYojna which includes:

1. Making invisible – visible – decision support tool for ground water management
2. Ground water as commence-strengthen community-based institutions to foster management
3. Improve water use efficiency and enhance ground water recharge
4. Fiscal decentralization

The major expected outcomes are

- Community institution on groundwater- an innovation in alluvial aquifer
- Optimizing the use of groundwater within the selected districts/blocks
- Reduction of at least 50% rate of decline in water level

To achieve the aforesaid objectives, State Project Management Unit (SPMU) is constituted (Fig 1.2) under the overall supervision of State Inter-departmental Steering Committee at state level supported by Technical Support Agency (TSA). SPMU works in close coordination with National Project Management Unit (NPMU) headed by Director, NPMU at Ministry level. At district level, under the leadership of District Commissioner, District Project Management Unit (DPMU) has been constituted supported by Ground water and IEC Expert. For Gram Panchayat level implementation of the project District Implementation Partners (DIP) were identified. Irrigation and Water Resources Department, IWRD, Haryana has been nominated as the Nodal Agency under the leadership of Director, Atal BhujalYojna. The AC and Executive Engineer of the respective districts are nominated as Nodal Officers for implementing the scheme. Manav Rachna

International Institute of Research and Studies has been interested with two DIP for Cluster 6 & Cluster 7.

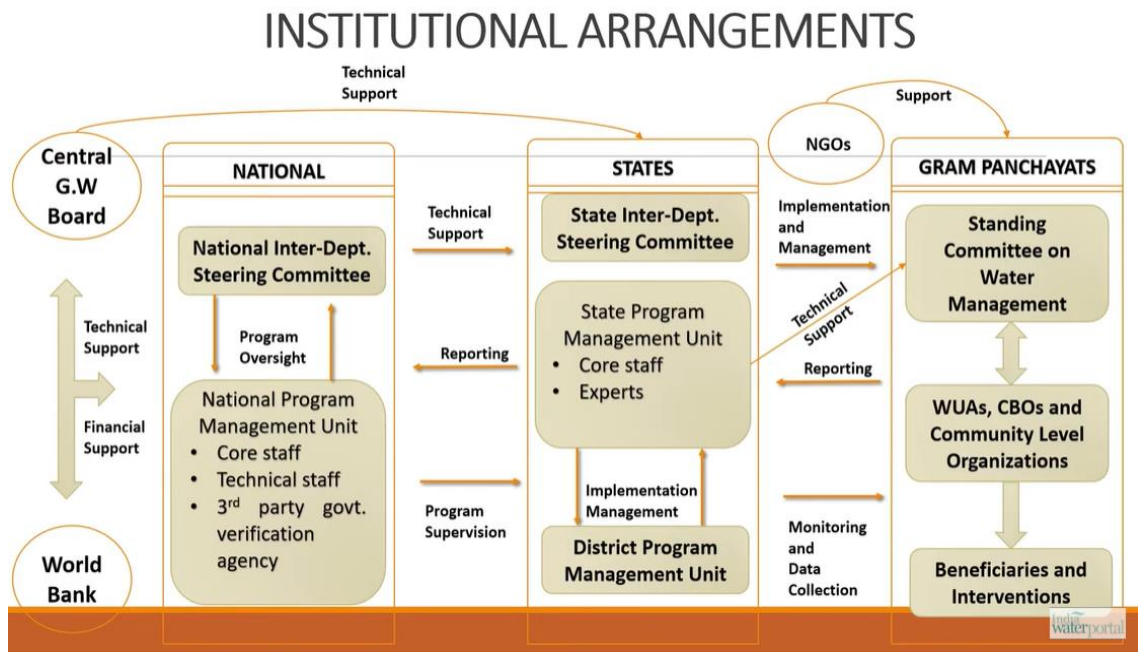


Fig 1.2 Institutional Arrangement under Atal Bhujal Yojana

C. Role and Responsibility identified for DIP:

The overall objective of the assignment to DIP is to provide support services to Gram Panchayats (GPs) & District Program Management Unit (DPMU) for effective implementation of Atal Bhujal Yojana. The assignment specific objectives are listed below.

The services to be rendered by the District Implementation Partners(DIPs) during various stages of the scheme (i.e.start-up, preplanning, planning, implementation, and exit) are presented below. The entire work will be carried out in four years (48 months from the date of commencement) under the guidance and direction of the DPMU / SPMU office. The proposed tasks are presented below.

1Start-up / pre planning activities

A. Preparation of inception report and work plan

1. Introductory meeting with district level officers and conduct rapid assessment of selected villages under Atal- Jal in the district.
2. Preparation of inception report along with scheme work plan in selected GPs for taking Atal-Jal work forward (with reference to Deliverable linked incentives (DLIs)

B. Preparation of baseline report (Ref. to DLIs)

1. Finalization of baseline format
2. Undertake Baseline survey in all selected villages and prepare village profile
3. Update the hydrological, meteorological, water conservation and agriculture data, etc on regular basis
4. Preparation of baseline report in suggested format

2 Community Mobilization

A. IEC campaign

1. Prepare district specific IEC and Behavioral Change Communication(BCC)plan
2. Disseminate basic information about Atal-Jal in selected villages - Atal Jal-concept, objectives, guiding principles, components, intuitional arrangement, key stakeholders etc.) through various communication tools- orientation meeting, awareness workshops, rally, film show, corner meetings etc..
3. Organize Inter Personal Communication (IPC) activities in selected villages for ensuring that the project key information reach all Household level(HHs).
4. Motivate community with a view to bring about behavioural changes from the role of passive beneficiary to active participants in Atal Jal.
5. Conduct IEC on technical and social topic – GW act, ground water recharging, water budgeting, demand creation for micro-irrigation, implementation of artificial recharge structure, rain water harvesting, government on-going scheme, etc.)
6. Prepare IEC tools for facilitating efficient use of water in all sectors – domestic level, agriculture, small business etc.
7. Facilitate usage of social media/ mass media for reaching all HHs in the selected project villages/GPs
8. Conduct IEC / BCC activities as directed by district/state
9. Develop Village information center at each village/GP for dissemination of GW related data for public.

B. Community mobilization and Strengthening of village / GP level institutions (GP / VWSC/ CBOs)

1. Prepare community mobilization plan based on rapid assessment exercise and facilitation of same (with reference to DLI). Organize GP / village level orientation workshops, working session of key stakeholders and orient them on Atal-Jal
2. Conduct meeting with Community Based Organizations(CBOs) for creating awareness on water issue and trigger them for adopting water saving technologies
3. Identify Community mobilizers/Volunteers for each Village and train them in GW level monitoring, water quality sample collection and Rainfall.
4. Undertake the social mobilization activities for creating enabling environment for project execution- ensure active participation women, weaker section groups, CBOs etc.
5. Facilitate meetings of all village / GP level stakeholders and community consensus on participatory decision-making, social actions, ownership etc. and relevant record keeping, preparing proceedings and documentation.
6. Assist GP in organizing Gram Sabha- Women / General and share basic information about Atal Jal.
7. Facilitate process for Village level institutions rejuvenation / formation and strengthen them in understanding and discharging their roles and responsibilities effectively.
8. Develop leadership skill among GP/ VWSC/CBOs members.
9. Assist DPMU for creating enabling environment for implementing Atal-Jal at all level by executing IEC and CM plan
10. Conduct training of village level institutions- GP members/ VWSC members/ CBO representative on their role in Atal-Jal and implementation of GW Act.

3. Action planning process and preparation of WSPs

A. Facilitate participatory assessment and preparation of WSPs

1. Collection of secondary data- village information from Gramsevak, Talathi, Agriculture assistance, Multipurpose Workers (MPW), Panchayat Samiti etc. required for water budgeting exercise and WSP preparation.
2. Conduct orientation of key stakeholders on participatory planning process.
3. Assessment through participatory techniques like Participatory Rural Appraisal (PRA) for mapping current challenges in the villages and undertake water budgeting, water balance estimation through method prescribed by SPMU/DPMU.
4. Collect secondary information of each village and conduct hydrogeological survey,
5. spatial analysis, drainage line inventory, cropping pattern and micro irrigation inventory for preparation of WSPs, as per protocol designed by SPMU.
6. Finalize WSPs as per the prescribed process and in the prescribed formats.
7. Annual updation of WSPs and water budgeting.
8. Organize and facilitate Gram Sabha- ensure participation of all community members and other stakeholders in the village, and get the Gram Sabha approval to WSPs
9. Assist district during WSP appraisal process.
10. Support DPMU to consolidate the water security plans, along with cost estimates for onward submission to SPMU for approval.

4. Implementation

A. Implementation preparation

1. Provide assistance to DPMU/SPMU in preparing village / Cluster / district procurement plans as suggested in manual/guideline
2. Provide support to DPMU/SPMU for procurement of works and goods
3. Provide necessary support to district for awarding works and finalize construction schedule.

B. Implementation facilitation

1. Assist GP / VWSC for facilitating implementation of water security plan through convergence.
2. Undertake close monitoring for ensuring quality of works, goods and services
3. Encourage the community through various communication tools / technique for demand creation for adopting water saving practices and recharging GW, roof top rainwater harvesting, soil and water conservation, etc as per WSP.
4. Take close follow up with line department and mobilize resource for increasing area under micro-irrigation, changing cropping pattern etc.
5. Triggering community for adopting efficient water use practices / technologies at farm, house, and village level.
6. Facilitate convergence and coordination of various on-going Government schemes.
7. Provide technical support to DPMU/SPMU for establishing mechanism for public disclosure of ground water related data and information.
8. Provide assistance to GP / VWSC in preparing project completion report
9. Provide assistance during selection of sites for equipment installation towards establishment of hydrological monitoring network and measurement and get necessary documentation done.

10. Deploy tools and techniques to enhance community participation in implementation and ensure transparency.

5.Exit & O & M

1. Build capacity of key stakeholders on O & M of supply side structures and exit process
2. Assist GP in working out O & M arrangement and its strengthening through meetings / working session, on the job support, process demonstration etc.
3. Record all the assets created under project in the GP asset register.
4. Complete handing over and exit process
5. Build capacity of key stakeholders for post project management
6. Assist GP in resolving disputes, beneficiary complaints

6. Other - On-going services

A. Capacity building

1. Designing of training outline, schedule and resource materials for facilitating trainings during various stages of scheme implementation.
2. Facilitate block / cluster and GP / village level trainings to equip and support various stakeholders for functioning effectively during various stages of scheme implementation i.e.startup, preplanning, planning, implementation, post implementation etc.
3. Prepare and submit training reports
4. Provide support to DPMU in organizing and facilitating various project related activities at district and GP level respectively (like coordination meeting, TOTs, workshops. Exposure visits, review meetings, working session, cross learning workshop etc.)

B. Documentation and reporting

1. Preparation of Inception report through rapid assessment and consultation with officials in DPMU.
2. Prepare progress report as listed under deliverable and payment term category.
3. Documentation of best practices, lessons, effective practices etc. for wider dissemination.
4. Assist DPMU in data collection, data entry and analysis
5. Support each GP for disclosure of information on ground water to the community
6. Providing support for monitoring:
7. Support for establishing community monitoring mechanism and reporting system
8. Track physical and financial progress
9. Monitor progress, process and performance against each DLIs
10. Assist DPMU/ SPMU in monitoring work.

C. Providing assistance in financial and admin management

1. Prepare annual action plan and budget for GPs.
2. Provide support to DPMU / SPMU in audits. (Internal and external audits.)

D. Brief history of DIP Organization:

Manav Rachna International Institute of Research and Studies (MRIIRS, Formerly MRIU), Deemed -to-be-University under section 3 of the UGC Act, 1956 is a continuum of excellence from the Career Institute of Technology and Management (CITM). It offers AICTE approved

courses and has been ranked among the Top Educational Institutions of the country in the prestigious 'India Rankings 2020' by NIRF, Ministry of Human Resource Development, Govt. of India. UGC has granted 12 B status to MRIIRS in affirmation to its strong focus in research and Development and has been ranked in Band A under Private or Self-Financed Universities category in the 'Atal Ranking of Institutions on Innovation Achievements' released in 2020 by the Ministry of Education, GoI.

MRIIRS has established **Centre for Advance Water Technology and Management (CAWTM)** in the year 2017 as Center for Excellence and is an outcome of several research projects which were undertaken by the university in the domain of environment and water. The researchers of the university have been consistently working for local administration and municipal corporation, Faridabad on issues such as capacity building of their officials, storm water management, artificial recharge, pond revival, etc. the diversity of MRIIRS fuels faculty members and researchers to undertake research problems pertaining to various domains with focus on environmental issues.

CAWTM works with the vision of ***"Clean water for all and forever"***. The center has proven its capabilities to deal with issues of water including source finding, regime monitoring, quality, water use efficiency, conservation, protection and governance, management of water etc. Apart from this, CAWTM is associated with various experts either on an individual level or institutional level, which has created a platform to provide complete solution to stakeholders. In line with its vision and mission, the Founder Chairman of CAWTM, Late D K Chadha, Former Chairman CGWB, GoI, used to say, ***"SadaSabkeLiyeShudh Jal"***, and that is the legacy of the center.

With an experience of 24 years to his credit, Prof. A. Mukherjee, formerly a scientist at Central Ground Water Board is currently the Director of CAWTM, MRIIRS. Under his leadership the center desires to get associated with ABY Haryana Project. The center has professionals from the field of Engineering, Geology, Hydrogeology, Biotechnology, Architecture, environment Management, and Geo-technology. Professionals at CAWTM aspire to take up the national challenges in the identified areas of water shortage, quality degradation, deprivation of rural poor from the basic need of good quality drinking water and other environmental issues. Global Climate Change, Carbon Dioxide sequestration in geological formations, Earthquake Precursor Studies, Phytoremediation etc. are the R&D activities in which the center is engaged. We are also eager to pool in best talents available globally for providing techno economic & socio fabric solutions on such issues.

MRIIRS is glade to have the opportunity to work as District Implementation Partner (DIP) for successful completion of Atal BhujalYojna in the State of Haryana, for we feel that with our experience and expertise we are capable of doing complete justice to the scheme of Haryana-Our State of Residence.

E. Institutional set up of DIP Team:

Manav Rachna International Institute of Research & Studies, Centre for Advance Water Technology and Management is coordinating the works of Atal BhujalYojna as DIP. Manav Rachna's institutional set up includes over-arching leadership of Dr. N. C Wadhwa, IAS (Retired), Director General, MREI, and Dr. Dipankar Saha, Chair Professor, CAWTM, MRIIRS. Director, CAWTM, MRIIRS, Dr. Arunangshu Mukherjee, Professor & Head, Department of

ES&E, is Project In-Charge Atal BhujalYojna and Ms. Sneha Rai, Assistant Professor, is team coordinator. The following field level officers are engaged under Cluster 6.(table 1.2). Apart from this, office support staff at CAWTM, Finance Department of University, Office of the Vice Chancellor and Office of Registrar is involved in managing the show in day-to-day basis.

Table 1.2 Details of DIP Field Staff of Cluster 6, District Faridabad And Rewari, Haryana

S. No	Name	Designation	Email	Phone No.
1.	Sandeep Kumar	Hydrogeologist	sandeepunia2017@gmail.com	9671306328
2.	Akshay	Hydrogeologist	akshayloohach1994@gmail.com	7206247546
3.	Yashwant Kumar	Water Conservation specialist	mailforyashwant80@gmail.com	9654378127
4.	Rahul Pandey	Agriculture specialist	pandeyrp15@gmail.com	9452952015
5.	Ravi Kumar Parmar	IEC Expert	raviparmar2511@gmail.com	9667241001
6.	Sandeep Kumar	IEC Expert	kumar.conti007@gmail.com	8930341125
7.	Mayank Jain	IEC Expert	director.cawtm@mri u.edu.in	9711199365
8.	Vaishali Mathur	IEC Expert	director.cawtm@mri u.edu.in	9990455824

2. DISTRICT WISE GROUND WATERPROFILING

2.1. Faridabad District:

Faridabad district is located in the South Eastern part of the Haryana state lies between latitude 28°15' to 28°30' and longitude 77°09' to 77°30' and falls under survey of India sheet number 53H/3 and H/6 largely. Total 71 Gram Panchayat of two blocks of Faridabad District is included under Cluster 6.

A. GEOMORPHOLOGY:

Geomorphologically the area comes under Yamuna sub-basin of Ganga basin. Bhuriya Naala is the main tributary drains Faridabad area. Other 3rd to 4th order stream exist in the district are Gochi Naala, Pakhal Naala, Jauhar Naala, Paliwaal Naala, Mehandwari Nadi, Jair Naala are the other important stream originates from Aravalli Hills and drain to either river Yamuna or disappear in the alluvial terrain. The district is bounded by Aravalli Hills in west and river Yamuna in east. The altitude of the district varies from 190 metres to 350 metres. (Source: SOI toposheet). The district is having two distinct geomorphological unit, first is the residual hills of Aravalli and second is Yamuna Alluvial plains. The Yamuna Alluvial plains can be further subdivided into Active flood-plain and Alluvial plain (Fig 2.1 and 2.2). A small portion of the district is covered by desert sand dunes. Topography of the district is undulated plain having linear ridges of quartzite running NS to NNE-SSW direction. The general slope of the area is NW to SE, West to East. (GSI : Saini et al. 2016 and Aquifer Mapping Report of NCR, CGWB Aug 2015)

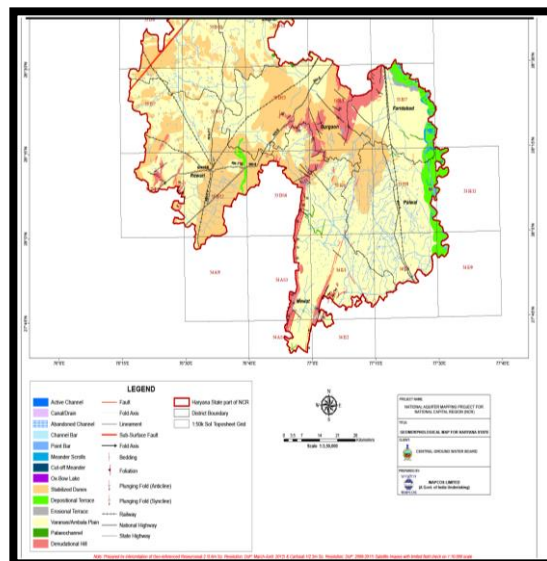


Fig 2.1 Geomorphology Map of Faridabad Palwal and Rewari district (Source CGWB 2015)

B. WATER RESOURCE PROFILE- SURFACE, GROUND WATER, RAINFALL AND TRADITIONAL SOURCE:

The district Faridabad is water stressed district. The climate of the Faridabad district can be classified to tropical to semi-arid to hot (table 2.1) which can mainly be characterized by extreme dryness of the air except during monsoon months June to September. South-west Monsoon prevails in the district. The normal annual rainfall is around 542 mm spread over 27 days. Monsoon constitutes about 85% of the rainfall (about 460 mm) and remaining 15%

rainfall occurs during non-monsoon months. (CGWB District Report 2013) Rainfall is the principal source of water in the district. The surface water exists in the form of perennial river Yamuna and canal water and pond water in the district. The canal flows in the district emerged from Okhla Barrage and divided into Agra canal and Gurgaon canal within the district. There were two important minor irrigation reservoirs namely Badhkal lake and Dhauj lake exist within the district. However, Badhkal lake was gone dry since 2006 and water in Dhauj lake reduced drastically during the last decade. Seasonal natural springs exist in the district largely along foothills of Aravalli, few of them can be located at Mohbatabad, Mangar and Parson area. However, many of the earlier existing springs were gone dry including Surajkund spring. Groundwater in the district shows distinct behaviour along both Aravalli Hills and Yamuna plain. On the Aravalli hill and along the Yamuna River, ground water levels are shallow compared to foothill areas and middle portion of the district. The shallower water lever varies from 10-20 metres whereas the deeper level goes down to 70-90 metres. Traditional source of water in the district are canal water, ground water and rainfall.

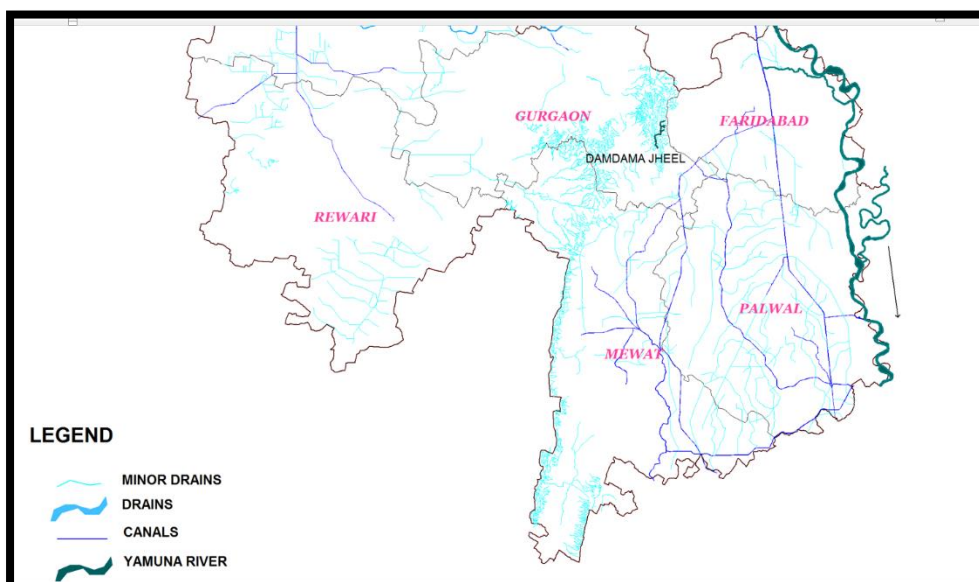


Fig 2.2 Drainage Map of Faridabad Palwal and Rewari district (Source: CGWB 2015)

Table 2.1: Seasonal and Annual Rainfall - Haryana State (in mm):-

RAINFALL SEASON	NORMAL R/F (mm)	ACTUAL RF (mm) - 2019	ACTUAL RF (mm) - 2020	% DEPARTURE 2019	% DEPARTURE 2020
WINTER	35.94	38.28	35.49	7%	-1%
PRE-MONSOON	36.00	38.49	116.26	7%	223%
SW MONSOON	511.00	289.18	316.57	-43%	-38%
POST-MONSOON	31.61	34.06	11.80	8%	-63%
ANNUAL	614.55	400.01	480.12	-35%	-22%

C. HYDROGEOLOGY:

Hydrogeologically Faridabad District can be divided into hard rock and soft rock terrain. The hard rock terrain constitutes Delhi Supergroup of rocks mainly quartzite represented by Ajabgarh Group of Late to middle Proterozoic age(table 2.2). The Ajabgarh Group of rock comprises mainly hard and massive bedded quartzite with local phyllitic intercalations.(Source: GSI, 2016) These rocks are exposed as conspicuous ridges all along the western part of the district running roughly North-South in the direction. The ridge is locally known as Harchandpur-Badhkal Ridge and are formed of Anticlinal plunging fold. The fold axis trend along N-S direction. The beds are steeply dipping between 50-80 degrees. The ridge is predominant in South and subducted towards North. In Pali and Mohbatabad the clippe of ridge attains a height of more than 20 metres. There are marginal faults along the ridge which produce 70-90 m thick alluvial deposition along the foothill. Quaternary alluvium unconformably overlies Delhi Supergroup of rocks as 30-140 m thick over-burdened of loose unconsolidated sediments. On the basis of typical lithology, stratigraphic position and continuity with the established sequence of Ganga basin the alluvium can be classified into Older and Newer Alluvium. This sequence comprises horizontal beds and lenses of brown to yellowish clayey silt, brown and grey sand and calcrete having lateral facies variation. The newer alluvium disconformably overlies older alluvium. A generalized lithostratigraphic succession is given below.

Table 2.2: Generalized Geology and Geomorphology of the district (Source- CGWB,2019)

Group	Age	Geological units	Geomorphological units
Quaternary	Holocene	Newer Alluvium Disconformity	Low land unit
	Pleistocene	Older Alluvium Unconformity	Up land unit
Pre Cambrian	Proterozoic	Delhi Super - group- Quartzites	Denudational/ Residual hill unit

The hard and fractured quartzite up to a depth of 90 metres produces phreatic aquifer. At places, the lower part of hard and fractured rock forms semi confined aquifer which remain in partial hydraulic connectivity with phreatic aquifer. Groundwater level in the hard rock varies from 10-70 metres in depth.

The alluvial rock also forms phreatic aquifer for upper 60 metres and many a time produce semi confined to confined condition due to presence of clay horizon forming Aquitard and aquiclude. Patchy occurrence of wind-blown sand forms local phreatic aquifer. At places, perched aquifers of very local extent hanging on regional aquifer has been observed. Groundwater level in alluvial aquifer varies from water-logged condition to deep as 40-50 metres.

Ground Water Conditions

The ground water occurs in unconfined conditions in alluvium as well as in weathered and jointed quartzites. In alluvium, sand of various grades from the potential aquifer zones. In quartzites, it occurs in the weathered zones and inter spaces within interconnected joints and fractures.

Depth To Water Level

The depth to water level in the area varies between 5.0 and 34.23 mbgl. Shallow water levels have been observed towards Yamuna River. The water table has been found deeper along the National Highway No 2, indicating that ground water stressed area has been formed traversing North-South due to heavy pumpage along the highway caused by dense network of tubewells due to concentration of habitation and industries.

Water Table Elevation

The altitude of water table ranges from 171.5 to 199.7 m.amsl. It is observed that the ground water flow is towards the central part of Faridabad from east and west. This phenomenon indicates of heavy pumpage of ground water along the National Highway for industrial and domestic purposes.

Aquifer Geometry

Based on the available data and lithological logs, a fence diagram (Fig 2.3) has been prepared to define aquifer geometry. The study suggests that:

- (i) The total thickness of unconfined aquifer is limited to about 50 m
- (ii) The depth to bed rock in the west as deciphered from the drilling data is within 170 m bgl while in the east near the river Yamuna it is more than 350 m bgl.
- (iii) The thickness of second aquifer is highly variable and increases from west to east.
- (iv) The thickness of fresh aquifer is confined to 40m.
- (v) Beyond 80m formations are mainly clayey and quality of water is marginal to saline.

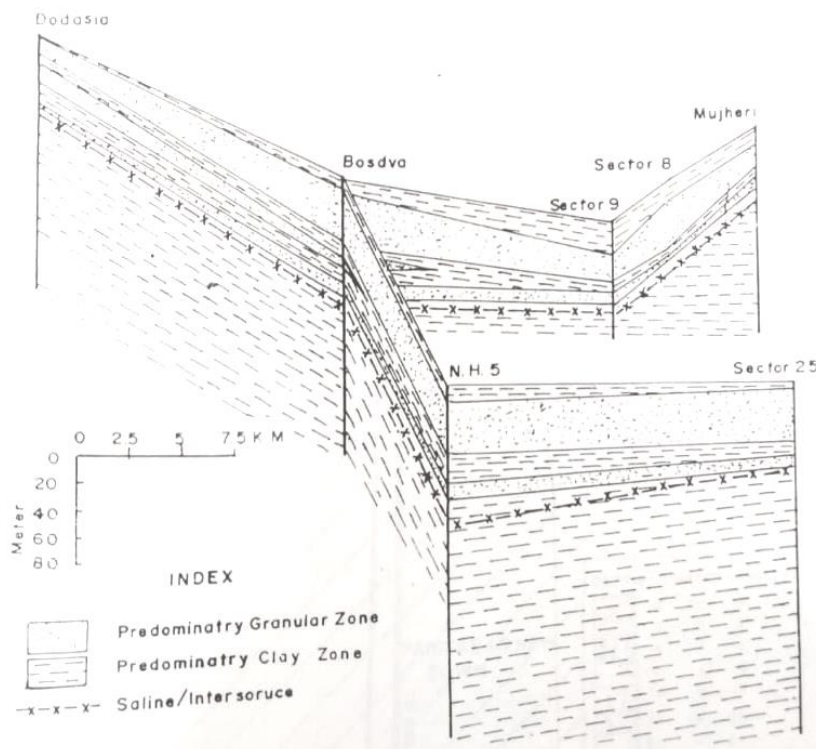


Fig 2.3
Fence Diagram of
Faridabad-
Ballabhgarh area (
Source: CGWB
2006)

D. GROUNDWATER RESOURCES:

Based on groundwater resource estimation, Faridabad district has been categorized under over-exploited category. The groundwater recharge area in Faridabad district comprises 65567 hectares out of total 74284 hectares. Total Groundwater recharge for the district thus comes to 16237 hectare-metre entirely fall under command area thus forms the annual groundwater recharge. 1426 hectare-metre has been considered as environmental flow which forms about 9%. Annual groundwater extraction is 19597 hectare-metre out of which 874 hectare-metre is of poor quality thus forming stage of ground water extraction 126%. Only 751 hectare-metre has been kept for allocation under future domestic utilization (CGWB, 2013).The unit draft for irrigation, domestic and industrial use is shown in Table 2.3

Analysis of the historical ground water resource data clearly demonstrate the changing stage of ground water extraction. Both the blocks are showing gradual shifting from safe/semi-critical to over-exploited category in last 15 years. The Ballabgarh block has shown much more groundwater development in comparison to Faridabad block where the stage of ground water development gone from 36% to 153% and the corresponding ground water level has also reflected depletion. Further, the Ballabgarh block is having 7064 hectares area under poor ground water quality out of total 20370 hectare. Trend of groundwater level in the district shows significant decline in both pre-monsoon and post-monsoon season. For Ballabgarh, it is -44.5 cm per year, and -58.5 cm/year in pre and post monsoon, whereas that for Faridabad is -40.7 and 49.4 cm/year (Source: CGWB, March 2013).

Faridabad district:

Total geographical area (ha)	74045
Command area (ha)	65328
Non-command area (ha)	1042
Poor ground water quality area (ha)	2351
Hilly area (ha)	8717

Table2.3 Unit draft for different use of Faridabad Haryana (Source: Groundwater estimation March, 2013, published in 2016 CGWB)

Unit draft	Unit draft for irrigation		Unit draft for domestic		Unit draft for industry	
	Monsoon	Non-monsoon	Monsoon	Non-monsoon	Monsoon	Non-monsoon
BALLABGARH	0.5625	0.6875	0.5973	1.21	0.5973	1.2127
FARIDABAD	0.6525	0.7925	0.5973	1.21	0.5973	1.2127

E. GROUNDWATER QUALITY:

The shallow Groundwater in the district is alkaline in nature where pH varies from 7.72-8.6 and is moderately to highly saline where EC varies from 690-3600 micro siemens/cm. Bicarbonate are the predominant anion along with patches of chloride dominance. Sodium is the dominant cation (Table 2.4). However, at some places mixed cationic character has been observed. 75% of the sample analysed from the district were found not suitable for drinking purpose mainly due to higher fluoride and salinity problem. SAR and residual sodium carbonate vary from 2.19-15.79 and 14.52-13.97 milli-equivalent respectively. US Salinity diagram classification of irrigation water indicated that sample falls under classes C2S1, C3S1, C3S2, C4S2, C4S3 & C4S4. These waters are not suitable for customary irrigation as they may cause salinity and sodium hazards. It would be better if such waters are used for semi-salt tolerant to salt-tolerant crop along with appropriate amount of gypsum on the well-drained soil. (Source: District Ground water Board, CGWB, 2013, Faridabad District, Haryana)

In general quality of water in Faridabad seems to have changed in last few years. Remarkable change in water quality has been observed due to change of aquifer being tapped.

Table2.4: Statistical Details of the Chemical Analysis of the Parameters
(CGWB, July2011, Report: Anmol Sharma)

	Max	Min	Standard Deviation	Mean
	(34 samples)			(34 samples)
pH	8.80	7.17	0.37	8.14
EC(µs/cm)	22800	557.00	4112.89	2974.65
CO3(mg/l)	940.00	40.00	15.06	62.72
HCO₃(mg/l)	558.00	95.00	106.82	272.34
Cl(mg/l)	6991.00	63.00	1272.24	638.75
SO4(mg/l)	2650.00	1.00	531.99	371.58
NO3(mg/l)	414.00	6.00	79.74	50.15
Ca(mg/l)	264.00	12.00	49.34	56.58
Mg(mg/l)	484.00	5.00	90.56	76.10
Na(mg/l)	1000.00	33.00	300.34	386.25
K(mg/l)	111.00	1.40	20.41	13.30
TH(mg/l)	2600.00	133.00	476.87	443.68
F(mg/l)	3.08	0.09	0.62	0.66

F. STATUS OF GROUND WATER DEVELOPMENT:

Analysis of the historical ground water resource data clearly demonstrate the changing stage of ground water extraction. Both the blocks of Faridabad are showing gradual shifting from safe/semi-critical to over-exploited category in last 15 years(Table 2.5). The Ballabgarh block has shown much more groundwater development in comparison to Faridabad block where the stage of ground water development gone from 36% to 153% and the corresponding ground water level has also reflected depletion. Further, the Ballabgarh block is having 7064 hectares area under poor ground water quality out of total 20370 hectare. Trend of groundwater level in the district shows significant decline in both pre-monsoon and post-monsoon season. For Ballabgarh, it is -44.5 cm per year, and -58.5 cm/year in pre and post monsoon, whereas that for Faridabad is -40.7 and 49.4 cm/year (Source: Data, CGWB March 2013). Potential recharge in water logged and shallow water table area for the district is 1068 hectare-metre. (Source: CGWB March 2013)

Name	2006	2011	2013	2019
Faridabad block (%)	75	84	92	116
Ballabgarhblock (%)	36	78	107	153
Faridabad District (%)				126

Changing Stage of Groundwater Extraction of district Faridabad(Source: CGWB)

G. SECTORAL UTILITY SCENARIO:

Annual ground water extraction for Ballabgarh is 6093 hectare-metres whereas same for Faridabad block is 10396 hectare-metres. Out of this, monsoon season extraction remain 8071 hectare-metre and non-monsoon groundwater extraction is 11526 hectare-metre.Total ground water extraction for the district has been estimated to 19597 hectare-metres out of which domestic and industrial extraction remain 13-15%. Therefore, irrigation utilization is about 85-87% (source: CGWB Resource estimation 2019-2020, www.ingres.iith.ac.in).

(Source: R

H. TREND IN UTILITY AND RESOURCE DEVELOPMENT:

It has been observed that groundwater utility in the district is increasing day by day. As a result, trend of groundwater level became negative and varies from -40.7cm/year to -58.5 cm/year during last 15 years, stage of groundwater development became semi-critical to over-exploited in the district. The present stage of resource development in the district is

126% and remain in over exploited category. Villages along the River Yamuna are utilizing both river water and groundwater for irrigation, whereas other villages utilize canal water and groundwater for irrigation. Domestic water utilization is increasing due to increase in population.

I. KEY MANAGEMENT CHALLENGES:

Detailed investigation regarding ground water scenario in the district clearly indicate this district is having ground water over-extraction in both the blocks. This has adversely impacted the environment. Non monsoonal flow to surface water streams/ponds has ceased or reduced drastically. As a result, many of the perennial streams became seasonal. Large number of springs has gone dry or remained as seasonal only. The key management challenges have been listed below:

- a. Declining water level trend
- b. Increasing stage of groundwater over-extraction
- c. Increasing ground water salinity
- d. Enhanced production of grey water and its mismanagement
- e. Rapid increase in population density
- f. Increase in trend of urbanization/industrialization
- g. Inter sectoral conflict of resource allocation

J. PROSPECTIVE WATER MANAGEMENT APPROACH:

To mitigate with declining ground water level trend and restrict the rapidly increasing stage of ground water development in the district, demand site and supply site management need to be initiated at GP level. For the effectiveness of demand site and supply site management participatory approach needs to be followed. Water use efficiency can be key to demand site management approach. Apart from improved technical interventions, behavioural change of groundwater stake holders needs to be implemented. Institutional strengthening and capacity building at grass root level has to be initiated immediately. Convergence of various government schemes is need of the hour, for example, under MGNREGA 70% of the fund utilization has been allocated for improvement of water related infrastructure. This needs to be drop tail with Atal BhujalYojna for effective management of supply site interventions. Similarly, government schemes like 'MeraPaaniMeriViraasat' and MICADA need to be drop tail for demand site interventions. For restricting the increase of poor ground water quality, Rainwater harvesting and Artificial recharge at micro-watershed level need to be increased. This not only improve the groundwater quality but also able to arrest declining water level trend. Water use efficiency can be solution to increasing urbanization/ industrialization and increasing sectoral conflict of water.

2.2. Rewari District:

Rewari is located in the southern part of the Haryana State adjacent to northern boundary of Rajasthan. It is surrounded by Gurgaon, Jhajjar, Mahendragarh districts of Haryana and Alwar block of Rajasthan. Total 40 Gram Panchayat of Khol block of Rewari

District is included under Cluster 6. Khol block lies between latitude 28°07'30" to 28°22'30" and longitude 77°18' to 77°32'30" and falls under survey of India sheet number 53D/7, D/8, D/11 and D/12 largely (SOI Toposheets). The Khol Block is approachable from Rewari via Rewari-Mahendragarh road. Delhi-Jaipur Railway line passes through southern edge of Khol block. The nearest railway station is Rewari Railway station. The total geographical area of district is 1, 50,678 hectares. It's almost all parts fall under poor fertile zone. It has around 87.65% land under agriculture purpose or cultivated. Land under build up area is around 5.50%. It indicates the district has very less development in terms of urbanization. It is mainly rural in nature. Only 3.29% areas cover under forest. (Source- Agriculture Department, Rewari 2013)

A. GEOMORPHOLOGY:

Geomorphologically the area comes under Yamuna sub-basin Chautang and other sub-basins of Ganga basin (CGWB 2019 Atlas). Surface water streams are sparse in the block. There is no perennial stream in the District Rewari. The main streams in the district are Sahibi and Krishnawati rivers. Sahibi River is an ephemeral river and rises from Mewat hill (Source: District Flood Control Order, 2021) s. The altitude of the district varies from 232 metres to 473 metres. The district is having two distinct geomorphological unit, first is the residual hills of Aravalli and second is Yamuna Alluvial plains. The Yamuna Alluvial plains can be further sub-divided into Active flood-plain and Alluvial plain. A small portion of the district is covered by desert sand dunes. Topography of the block is undulated plain (CGWB 2015) having two linear ridges of quartzite running NS to NNE-SSW direction as shown in Fig 2.1 and 2.2.

B. WATER RESOURCE PROFILE- SURFACE, GROUND WATER, RAINFALL AND TRADITIONAL SOURCE:

The district Rewari is water stressed district. The climate of the Rewari district can be classified to tropical to semi-arid to hot which can mainly be characterized by extreme dryness of the air except during monsoon months June to September. South-west Monsoon prevails in the district. The average annual rainfall is around 480 mm spread over 27 days. Monsoon constitutes about 85% of the rainfall (about 412 mm) and remaining 15% rainfall occurs during non-monsoon months. Rainfall is the principal source of water in the district (Table 2.6). The surface water exists in the form of canal water in the district. Groundwater in the district shows distinct behaviour along both Aravalli Hills and Alluvial plain. On the Aravalli hill, ground water levels are shallow compared to foothill areas and alluvial portion of the block. The shallower water level varies from 15-25 metres whereas the deeper level goes down to 70-90 metres. Traditional source of water in the district are canal water, ground water and rainfall.

Table 2.6 Annual rainfall in Rewari District (Source District Flood Control Order, Rewari 2021)

Sr. No.	Year	Rain Gauge Station in District Rainfall Received in MM					Average Rainfall
		REWARI	BAWAL	KHOL	JATUSANA	KOSLI	
1	2009	460.0	391.0	141.8	465.0	197.0	330.96
2	2010	786.0	701.0	623.0	710.0	649.0	693.84
3	2011	430.0	666.0	336.0	598.0	430.0	492.1
4	2012	328.0	451.0	275.0	397.0	276.0	345.46
5	2013	685.0	642.0	502.0	647.0	421.0	579.48
6	2014	371.0	696.0	235.0	347.0	372.0	404.28
7	2015	478.0	583.0	384.0	393.0	376.0	442.8
8	2016	531.0	892.0	368.0	631.0	686.0	621.6
9	2017	365	595.6	147.0	468.0	447.0	404.52
10	2018	695.0	583.0	233.0	575.0	371.0	491.4
Note: District Received 480.64 MM average rainfall.							

C. HYDROGEOLOGY:

Hydrogeologically Rewari District can be divided into hard rock and soft rock terrain. The hard rock terrain constitutes Delhi Supergroup of rocks mainly quartzite and Phyllite represented by Ajabgarh Group of Late to middle Proterozoic age. The Ajabgarh Group of rock comprises mainly hard and massive bedded quartzite and Phyllite (Source: GSI, 2016). These rocks are exposed as conspicuous ridges all along the middle part of the block running roughly North-South in the direction in two parallel ridges. The ridges are formed of Anticlinal plunging fold. The fold axis trend along N-S direction. The beds are steeply dipping between 50-80 degrees. Quaternary alluvium unconformably overlies Delhi Supergroup of rocks as 30-140 m thick over-burdened of loose unconsolidated sediments. On the basis of typical lithology, stratigraphic position and continuity with the established sequence of Ganga basin the alluvium can be classified into Older and Newer Alluvium (Table 2.7). This sequence comprises horizontal beds and lenses of brown to yellowish clayey silt, brown and grey sand and calcrete having lateral facies variation. The newer alluvium disconformably overlies older alluvium. A generalized lithostratigraphic succession is given below.

Table 2.7: Generalized Geology and Geomorphology of the district (Source- CGWB 2019)

Group	Age	Geological units	Geomorphological units
Quaternary	Holocene	Newer Alluvium Disconformity	Low land unit
	Pleistocene	Older Alluvium Unconformity	Up land unit
Pre Cambrian	Proterozoic	Delhi Super - group- Quartzites	Denudational/ Residual hill unit

The hard and fractured quartzite up to a depth of 70 metres produces phreatic aquifer. At places, the lower part of hard and fractured rock forms semi confined aquifer which remain

in partial hydraulic connectivity with phreatic aquifer. Groundwater level in the hard rock varies from 15-70 metres in depth.

The alluvial rock also forms phreatic aquifer for upper 60 metres and many a time produce semi confined to confined condition due to presence of clay horizon forming Aquitard and aquiclude. Patchy occurrence of wind-blown sand forms local phreatic aquifer. At places, perched aquifers of very local extent hanging on regional aquifer has been observed. Groundwater level in alluvial aquifer varies from water-logged condition to deep as 20-70 metres.

Ground Water Conditions

The ground water occurs in unconfined conditions in alluvium as well as in weathered and jointed quartzites. In alluvium, sand of various grades from the potential aquifer zones. In quartzites, it occurs in the weathered zones and inter spaces within interconnected joints and fractures.

Depth To Water Level

The depth to water level in the area varies between 8.5 and 25.32mbgl. The seasonal groundwater level fluctuation varies up to 4 metres. The long-term water level trend indicates falling trend between 0.25 m/year to 1.5 m/year (CGWB District Report, 2013).

Water Table Elevation

The altitude of water table ranges from 229 to 244m.amsl. It is observed that the ground water flow is towards north and NNE.

Aquifer Geometry

Based on the available data and lithological logs, a fence diagram has been prepared to define aquifer geometry. The study suggests that:

- (i) The total thickness of unconfined aquifer is limited to about 70 m.
- (ii) The depth to bed rock in the Khol block as deciphered from the drilling data is between 90-230m bgl.
- (iii) The thickness of second aquifer is highly variable.
- (iv) The aquifers are saline/brackish in and fresh water zones are in pockets only.

D. GROUNDWATER RESOURCES:

Based on groundwater resource estimation, Khol Block of Rewari district has been categorized under over-exploited category. The groundwater recharge area in Khol Block of Rewari district comprises 24126 hectares out of total 27524 hectares. Total Groundwater recharge for Khol block thus comes to 3662 hectare-metre entirely fall under command area thus forms the annual groundwater recharge. 366 hectare-metre has been considered as environmental flow which forms about 10% of annual groundwater recharge. Annual

groundwater extraction for Khol block is 6303 hectare-metre out of which 3398 hectare-metre is of poor quality thus forming stage of ground water extraction 191%. Only 725 hectare-metre has been kept for allocation under future domestic utilization (CGWB, 2013). The unit draft for irrigation, domestic and industrial use is shown in Table 2.8

Analysis of the historical ground water resource data clearly demonstrate the changing stage of ground water extraction. The Khol block is showing gradual decrease in extraction. However, it remains in the category of over-exploitation in last 15 years. Trend of groundwater level in the block shows significant decline in both pre-monsoon and post-monsoon season. For Khol, it is -203 cm per year, and -129.5 cm/year in pre and post monsoon (Source: CGWB, March 2013).

Khol block:

Total geographical area (ha)	27524
Command area (ha)	24126
Non-command area (ha)	0
Poor ground water quality area (ha)	3398
Hilly area (ha)	4458

Table 2.8 Unit draft for different use of Rewari Haryana (Source: Groundwater estimation

Unit draft	Unit draft for irrigation		Unit draft for domestic		Unit draft for industry	
	Monsoon	Non-monsoon	Monsoon	Non-monsoon	Monsoon	Non-monsoon
Khol	0.192	0.768	0.2574	0.5226	0.2574	0.5226

March, 2013, published in 2016 CGWB)

E. GROUNDWATER QUALITY:

The shallow Groundwater in the district is highly mineralized, alkaline and soft to hard in nature where pH varies from 7.18-7.8 and is moderately to highly saline where EC varies from 1322-5790 micro siemens/cm. Both bicarbonate and chloride are dominating anions along with patches of sulphate dominance, whereas sodium is the dominant cation. However, at some places mixed cationic character has been observed. 75% of the sample analysed from the district were found not suitable for drinking purpose mainly due to higher fluoride and salinity problem. US Salinity diagram

classification of irrigation water indicated that sample falls under classes C3S1, C3S2, C4S1, C4S3 & C4S4. These waters are not suitable for customary irrigation as they may cause salinity and sodium hazards. It would be better if such waters are used for semi-salt tolerant to salt-tolerant crop along with appropriate amount of gypsum on the well-drained soil. (Source: District Ground water Board, CGWB, 2013, Rewari District, Haryana)

F. STATUS OF GROUND WATER DEVELOPMENT:

Analysis of the historical ground water resource data clearly demonstrate the changing stage of ground water extraction. The Khol block is showing gradual decrease in extraction. However, it remains in the category of over-exploitation in last 15 years (table 2.9). Annual groundwater extraction for Khol block is 6303 hectare-metre out of which 3398 hectare-metre is of poor quality thus forming stage of ground water extraction 191%(CGWB, 2013).

Table 2.9 Changing Stage of Groundwater Extraction of district Rewari(Source: CGWB)

Name	2009	2013	2017	2019-20
Khol block (%)	194	191	170.46	132.58
Rewari District (%)	112	92	106	139

G. SECTORAL UTILITY SCENARIO:

The Annual ground water extraction is 2623 hectare-metre, whereas groundwater extraction is 3477hectare-metre, where irrigation draft is 3228 hectare-metre and domestic and industrial draft is 237 and 12 hectare-metre respectively (Source: CGWB Resource estimation 2019-2020, www.ingres.iith.ac.in). There were more than 6500 groundwater structures in the block. The rate of annual replenishable recharge 0.13-0.31 m/year.

H. TREND IN UTILITY AND RESOURCE DEVELOPMENT:

It has been observed that groundwater utility in the Kholblock is remained over-extracted. As a result, trend of groundwater level became negative and varies from -203 cm/year to -129.5 cm/year during last 15 years. The present stage of resource development in the block is 132.58%.

I. KEY MANAGEMENT CHALLENGES:

Detailed investigation regarding ground water scenario in the block clearly indicate this block is having ground water over-extraction. This has adversely impacted the environment. Non monsoonal flow to surface water streams/ponds has ceased or

reduced drastically. As a result, many of the perennial streams became seasonal. Large number of springs has gone dry or remained as seasonal only. The key management challenges have been listed below:

- a. Declining water level trend
- b. Increasing stage of groundwater over-extraction
- c. Increasing ground water salinity
- d. Enhanced production of grey water and its mismanagement
- e. Rapid increase in population density
- f. Increase in trend of urbanization/industrialization
- g. Inter sectoral conflict of resource allocation

J. PROSPECTIVE WATER MANAGEMENT APPROACH:

To mitigate with declining ground water level trend and restrict the over-extraction in the Khol block, demand site and supply site management need to be initiated at GP level. For the effectiveness of demand site and supply site management participatory approach needs to be followed. Water use efficiency can be key to demand site management approach. Apart from improved technical interventions, behavioural change of groundwater stake holders needs to be implemented. Institutional strengthening and capacity building at grass root level has to be initiated immediately. Convergence of various government schemes is need of the hour, for example, under MGNREGA 70% of the fund utilization has been allocated for improvement of water related infrastructure. This needs to be drop tail with Atal BhujalYojna for effective management of supply site interventions. Similarly, government schemes like 'MeraPaaniMeriViraasat' and MICADA need to be drop tail for demand site interventions. For restricting the increase of poor ground water quality, Rainwater harvesting and Artificial recharge at micro-watershed level need to be increased. This not only improve the groundwater quality but also able to arrest declining water level trend. Water use efficiency can be solution to increasing urbanization/ industrialization and increasing sectoral conflict of water.

3. DISTRICT LIVELIHOOD SCENARIO

3.1 Faridabad

A. SECTORAL DEPENDENCY OF VARIOUS FORMS OF LIVELIHOOD:

The Faridabad district based on Census has been divided into urban and rural sectors. The total workers as per Census 2011 in the district exist 579229 out of which 472471 urban and 106758 rural. The main workers in urban sector are 410860 and in rural 84456 whereas total cultivators in the district are 23654 largely are from rural area except 3991 urban cultivators. Apart from this, there are total 19382 agricultural labour largely are from rural sector (10984) whereas household industry workers in the district are 27869 out of this 23891 are from urban sector. Total other workers in the district were found 424411 which includes 49831 from rural and 74580 from urban. Women and men have access to work through MNREGA which grants them with 100 days of work in year with minimum wages.

B. TEMPORAL TREND IN LIVELIHOOD FORM:

Total Cultivators are 4% and total agricultural labour are 3%. Household Industrial worker around 5%, 73% are other workers. Therefore, the trend in the district is doing other work than agriculture (Source: Census 2011, District Hand book- Faridabad, Series 7, Part B Haryana). Work participation ratio of Faridabad district is 32% in comparison to 35.2% of state where male participation rate 49.4 % and female participation rate is 12.1%. Percentage of cultivator to total worker in the district in 2011 is 4.8 %, in 2001 it was 9.6%. Similarly, agricultural labour is 5.1% in comparison to 4.3% in 2001. It clearly indicates their large migration from cultivator to other work group including minor shift towards agricultural labour.

3.2 Rewari

A. SECTORAL DEPENDENCY OF VARIOUS FORMS OF LIVELIHOOD

The Rewari district based on Census has been divided into urban and rural sectors. The total workers as per Census 2011 in the district exist 337727 out of which 73352 urban and 264375 rural. The main workers in urban sector are 67458 and in rural 182761 whereas total cultivators in the district are 73994 largely are from rural area except 2596 urban cultivators. Apart from this, there are total 10452 agricultural labour largely are from rural sector (9376) whereas household industry workers in the district are 6249 out of this 2307 are from urban sector. Total other workers in the district were found 159524 which includes 98045 from rural and 61479 from urban.

B. TEMPORAL TREND IN LIVELIHOOD FORM:

Total Cultivators are 22% and total agricultural labour are 4%. Household Industrial worker around 2.5%, 63% are other workers. Therefore, the trend in the district is doing other work than agriculture (Source: Census 2011, District Hand book- Rewari, Series 7, Part B Haryana). Work participation ratio of Faridabad district is 37.5% in comparison to 35.2% of state where male participation rate 49.6% and female participation rate is 24%. The percentage of Cultivators to Total Workers in 2011 in the district is 30.4 per cent whereas during 2001 it was 44.4 percent. Similarly, the percentage of Agricultural labourers to total workers in 2011 in the district is 8.4 per cent whereas during 2001 it was 13.3 per cent. It clearly indicates their large migration from cultivator to other work group including minor shift towards agricultural labour.

4. WATER SECURITY PLAN: APPROACH AND METHOD

A. INSTITUTIONAL FLOW FOR PREPARATION OF WSP

Manav Rachna International Institute of Research and Studies has been engaged as DIP for Cluster 6 which includes District Faridabad and Rewari where two community development block Faridabad and Ballabgarh of Faridabad District and Khol block of Rewari exist, Total 111 Gram Panchayat are included under Atal BhujalYojna in the district. The preparation of Water security Plan commences with secondary data collection for all the 111 Gram Panchayat. Immediately after engagement of MRIIRS as DIP, MRIIRS has appointed core field staff for the district which includes two Hydrogeologists, one each water conservation specialist and agricultural specialist and 3 IEC Experts, apart from community level worker at village level. The engaged core staff were first trained about the aim and objective of Atal BhujalYojna and were oriented towards their specific role under ABY. After induction level training the field staff were posted in the field first for collection of secondary data to prepare village profile and preparation of GP wise baseline data required for preparation of Water Security Plan. Subsequently capacity building of the field staff about the district wise ground water profiling and livelihood scenario were done so that all the core staff are able to understand their role in preparation of WSP. The core staff were also trained to operate the MIS System and groundwater app necessary for preparation of Water Security Plan. Adequately trained and oriented field staff were engaged in preparation of WSP. The steps involved in preparation of WSP is given below.

B. METHODOLOGY FOR PREPARATION OF WSP

For planning of preparation of WSP, meeting with DPMU has to be done where cluster of Gram Panchayat were selected for preparation of WSP based on the overall target for the district per month. As per the selected GP field party visits to the village and first meeting one is arranged with village level Water & Sanitation Committee. During this meeting, VWSC members are engaged to introduce with the aim and objective of ABY and the role of VWSC member in formulation and implementation of WSP. During the second meeting, PRA participatory rural Appraisal and transit walk are been organized at the same time social monitoring and profiling about the GP is made. During the third meeting, key water related issues are discussed and following the bottom-up approach possible solutions were listed for both supply site and demand site management. During the fourth meeting, Jal Panchayat is organized where resolution is passed for various proposed intervention involving the Gram-Sabha. Half to 3/4th members of VWSC must be present during this Jal Panchayat. During the organization of all the four meetings it is mandatory to maintain gender equity involving social equity. All the Minutes of the meetings are to be prepared and uploaded in the MIS System and on Atal Bhujal App. For preparation of each WSP under

MIS, credentials are to be generated with the help of SPMU and these unique credentials are to be maintained for each village for entire duration of the project.

C. DATA GATHERING TOOLS

Various tools are in use for data gathering for preparation of WSP. This includes water level measuring tapes, in situ water quality analysis kit, rain gauging stations, automatic water level recorder fitted in GP based purpose-built piezometer. The groundwater app is to be used for georeferencing of all water abstraction structure and water conservation structures. Environmental and social safeguards tool include Environmental safeguards and screening tool, Construction environment monitoring tool, Environmental Mitigation measures tool, Recharge water quality monitoring tool and Treated wastewater Monitoring tool.

D. PROCESS FLOW AND PROTOCOLS

The MIS is used for preparation of WSP following the process and protocol included under following modules:

1. Gram panchayat data collection information

This module includes four chapters GP profile, field data collection, secondary data collection and social monitoring.

2. Water Security plan

This module includes six chapters gram panchayat, water availability, water utilization, balance, water budget and Water security plan.

3. Social management

This module includes details of members of VWSC Committee, DIP agency, other local institutions, Program beneficiaries, Community Participation and Capacity building and training.

4. Environmental and social safeguards tool

This module includes Environmental safeguards and screening tool, Construction environment monitoring tool, Environmental Mitigation measures tool, Recharge water quality monitoring tool and Treated wastewater Monitoring tool.

STEPS INVOLVED IN WSP PREPARATION

- 1. Obtaining GP list from SPMP, collection of secondary data to prepare village profile and preparation of GP wise baseline data**
- 2. Credentials generation for each GP for MIS and Mobile App ,**
- 3. Mapping of VWSC and its members**
- 4. Meeting 1-Orientation on Atal Jal,**
- 5. Budget-Meeting 2 with VWSC & community on Water Balance- Water Availability, Water Utilization, Balance-Budget,**
- 6. GPDCI Module Filled,**



7. Water Meeting 3 for (DDP)Demand Decrease Plan & (SIP) Supply Increase Plan], Transect Walk to sites suggested for Supply Increase Plan, Collection of Details of Proposed Demand & Supply Side Interventions along with preparation of Activity sheet,
8. Well Inventory, Geo-tagging of Ground Water Monitoring Well, Geo-tagging of Artificial Recharge/Water Conservation Structures,
9. Declaration of Source of Data in MIS portal,
10. Sharing of Draft WSP with DPMU,
11. Meeting 4 - GP level meeting for WSP Approval,
12. Data entry in MIS,
13. Preparation of GIS maps
14. WSP vetted by DPMU, and Comments/observations obtained),
15. Data correction in MIS as per DPMU suggestions,
16. WSP Approved at GP Level and Resolution passed,
17. WSP vetted by DPMU (with Declaration),
18. ESS tool uploaded in the MIS,
19. Social Management Module filled
20. Approved WSP uploaded in the MIS

E. SCOPE OF SCHEME INCORPORATION

The scheme provides scope of incorporation and convergence with various schemes of Central and State government as MGNREGA, Merapaani Meriviraasat, Soil and water conservation etc. for drop tailing and implementation under Atal Bhujal Yojna. The MGNREGA and Soil and Water Conservation etc can be utilized for Supply side intervention, whereas the Merapaani Meriviraasat etc are useful for Demand side intervention. Apart from these WSP can incorporate works of the Haryana Pond and Waste Water Management Authority, Forest Department, Rural Development Department, Department of Agriculture, HAREDA, Horticultor, PHED, IWRD etc.

F. SCOPE OF INSTITUTIONAL INCORPORATION INCLUDING VILLAGE LEVEL TRADITIONAL INSTITUTION

SPMU and DPMU has been constituted at state and district level to coordinate in preparation of GP level WSP and implementation of Atal Bhujal Yojana. IWRD is the nodal Agency at state level and respective district level offices of IWRD are the nodal office at district level. TSA, DIP and DPMU support staff has to facilitate the preparation of GP wise WSP and its implementation. At district level under the chairmanship of the DC DPMU-DIP has to function. All the line department has to support in data generation and in implementation of the DDP and SIP through convergence. For Capacity building and strengthening of institutions and behavioural change of stakeholders the IEC and media team of various departments are to be included. The Panchayti Raj institution at grass root level having significance in preparation of WSP.

Village level institutions like Jal Viraadri/Jal Panchayat/ village Water & sanitation Committee(VWSC) etc. have to play a significant role in planning, implementation and execution of WSP. Village level talent has to be nurtured for sustainability and operational maintenance of infrastructure/ assets created for water security of gram panchayat level.

G. STRATEGY FOR WSP IMPLEMENTATION

Atal BhujalYojna has planned such a way that the various schemes of local state level and central level need to be converged for creation of assets and proper implementation of supply site and demand site management proposed under WSP (Table 4.1). For getting the benefits of convergence, behavioural change to promote judicious use of ground water resources, source sustainability for intervention and improved ground water sustainability needs to be targeted.

Table 4.1 PLAN OF ACTION FOR WSPs UNDER ATAL BHUJAL YOJANA, HARYANA

Sl.No	Activity	Course of Action	Remarks
1	Field level data collection		
a	Short meeting with Sarpanch	Organise a short meeting with sarpanch, orient him about ATAL JAL and tell him about his support required for WSP preparation.	
b	Hamlet level Meeting with Community	Organise Hamlet level meeting with 10 to 15 Participants with the support of Sarpanch, Discuss about Atal Jal and take the plan of Demand side plan(Drip Sprinkler, crop diversification and UGPL) and Supply side intervention (Recharge pit, Soak Pit, Johad cleaning/ Johad Renovation, Root top rain water harvesting).	In hamlet level meeting major focus should be on Demand Side intervention Plan (Drip Sprinkler, crop diversification and UGPL) and Supply side intervention (Recharge pit, Soak Pit, Johad cleaning/ Joohad Renovation, Root top rain water harvesting). collect the detail like - Beneficiary name, proposed activity and area for proposed intervention
c	Field data	Well inventory data (Atleast 10 wells).	Geotagg only 15 wells. Take all the required information in hard copy (use well inventory format). In case Mobile App is not working take the photograph with the phone camera and collect the information in hard copy(use well inventory format)

		Geo-tag the same 10 wells for Ground water monitoring	take 10 wells from 15 tagged wells for well inventory. In case Mobile App is not working take the photograph with the phone camera and collect the information in hard copy(use GWM format)
		Geotag all the Artificial recharge structures at Village level.	Collect the information in hard copy also (Length, breadth, Depth,lat,Long etc.
2 Secondary data collection			
a	Demographics data	Collect all the population data (Total, Male, Female, Category wise population(ST,SC,OBC,GEN,APL, BPL) from Gram Sachiv only.	Letter to Sachiv and Sarpanch for coordination and support will be sent from DC
b	Land Use Land Cover Data	Collect all the information like- Total GP area, Forest area, Fallow land, Cultivable land, Net Sown Area From block Agriculture officer.	Letter to Block agriculture officer for providing data and information will be sent from DC.
c	Irrigation data	Area under irrigation in Kharif, Rabi and Summer season, total unirrigated area and Gross cropped area, collect all the data from Block Agriculture officer.	
d	Irrigation type (Area in Hectare)	Collect data on how much area irrigated from Canal, tanks, dugwell and Borewell, from Block agriculture officer	
e	No of existing well	Collect the data on existing well (total no of Dugwell, borewell, tubewell, dugwell cum borewell, from Block agriculture officer	
f	Water Lifting Sources	Collect the data for Existing lifting sources at GP like- Electric Pump, Diesel Pump, centrifugal pump, submersible pump, solar pump etc from block agriculture officer.	

H. CONVERGENCE STRATEGY OF THE SCHEMES

It has been identified that four type of convergence are possible including Financial, Institutional, Technical and Social Mobilization. The objective of these convergence is Targeted to sustainable ground water management mainly through convergence among various ongoing schemes with the active participation of local communities and Stakeholders. For convergence of state and central schemes with Atal BhujalYojna (Fig 4.1) institutional strengthening and capacity building at various level has to be adopted. Meeting and workshop for financial infrastructure and human Resource Convergence are key for successful convergence. Seamless interaction between NPMU,

SPMU, DPMU and DIP under the overall guidance of Advisory council are key to the success of convergence.

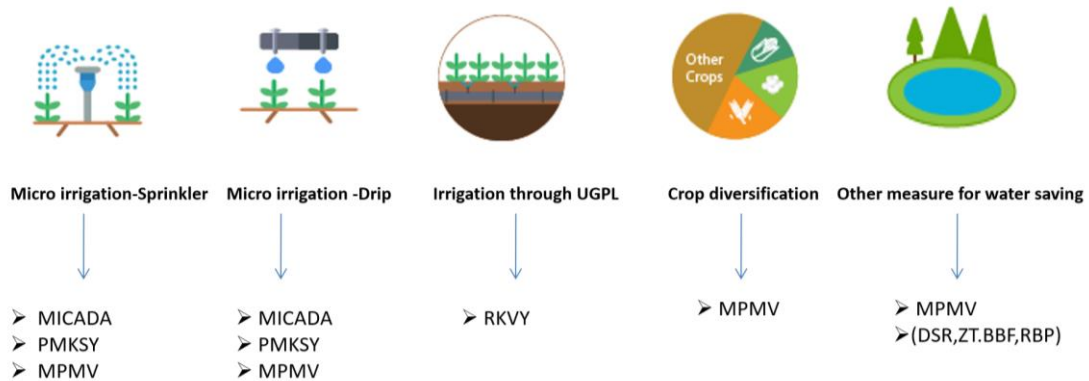


Fig 4.1 Supply side and Demand side intervention and possible convergence with schemes

I. SCOPE AND PLAN FOR ADAPTATION OF WATER EFFICIENT PRACTICES

Various success stories portrayed throughout the country for water conservation and water efficient use, and behavioural change has to be identified in context with Haryana. The water efficient practice need to be adopted to reduce the sectoral demand of water. Since over 80% of water is being consumed for irrigation thus water efficient irrigation practice has the potential to reduce the demand substantially. Recycling and reuse of water also improve the water efficiency. In Haryana scope of micro irrigation and grey water management can be adopted successfully.

J. WORK PLAN FOR PREPARATION AND IMPLEMENTATION

For successful conductance of role of DIP, the entire work has to be divided into 6 parts which includes GP level water balance and water budgeting plan for preparation of WSP, capacity building and training of stakeholder and local and district level institutions, meeting/workshop/mass awareness involving stakeholders and officials, strengthening of GP level institutions, development of participatory Groundwater management system, preparation and submission of report. All the 6 steps are further sub-divided into various steps as given below(Fig 4.2)

ATL BHUJAL YOJNA- HARYANA						
Sno	TASK	SUSTAINABLE MANAGEMENT OF GROUNDWATER				
1	GP level WSPs & Water Budgeting	Data collection	Formulation of WSP	Annual approval of WSPs	Recommendations	Implimentations
2	Capacity Building/ Training	Stakeholder level (Monthly)	GP level (Quaterly)	Block level (Annualy)	District level (Annualy)	
3	Meeting /Workshop/ Mass awarness	Stakeholder level (Monthly)	GP level (Bi-monthly)	Block level (Six monthly)	DPMU level (Annualy)	SPMU level (Annualy)
4	Strengthening of GP level Institutions	Develop Village Information Center - 399 numbers	Preparation of Annual action Plan and Budget for GP and assistance in Audit	Preparation of district spacific communication BCC plan	Buil the capacity of VWSC,CBO, Village Govt Officials, telent hunt	Site selection for Monitoring Network Establishment
5	Development Participatory GW Management System	Awarness through mobile van at 399 GP level	IEC tool kit for facilitate effcient use of water	Preparation of App to reaching all HHs for active participation	Establish community monitoring mechanism at GP level	
6	Report Submission	Inception Report (1)	Report on Public disclouser of information on GW (4)	Quarterly progress reports (16)	Reports on WSPs (4)	Final Report (1)
		Preperation of village profile with base line data all 399 GP	Training reports of all training conducted	Documentation of best practices, lessons, effective practices		

Fig 4.2 Plan of execution

K. GP WISE BASELINE

GP Wise baseline data of 111GP for cluster-6 is annexed in Annexure -1.

(Attached in Annexure I)

L. Comprehensive management plan

a. Community management practices:

Community management is needed to connect with relevant communities, build relationships and create value for the members of the community. Community managers are on the frontlines helping retain existing customers and search for new ones. Community management actively facilitates conversions, willing to go wherever the conversion is happening or driving conversion or engagement. Thus, community management involves creating social media content. Community managers need to find out what the community members define as success, monitor the right channels, create and ask interesting questions to engage the community, respond to relevant conversations, develop consistent engagement drivers and keep an eye on completion. Community management tools include social media software like Sprout Social, Hootsuite, Mention, etc. Community management is critical to the success of Atal Bhujal Yojna. Community managers are the tone voice and human element behind the Atal Bhujal Yojna.

Community management allows to:

- Obtain feedback and gather ideas from stakeholders through real-time conversations
- Provide support to audience/stakeholders when they need it
- Increase awareness among stakeholders about Atal Bhujal Yojna
- Learn about the stakeholders and what they want, expect and need in terms of content, product, services and support
- Build one-on-one and one-to-many relationships between community members and Atal Bhujal Yojna
- Boost interaction and conversation
- Provide value to stakeholders beyond the product and service

Manav Rachna International Institute of Research and Studies has engaged radio Manav Rachna (FM 107.8) as a social media channel for community management for the district Faridabad.

The IEC expert of DPMU, and IEC Experts of DIP are engaged in community management for which they are preparing and displaying banners and posters. Distributing booklets, reporting activities on local newspapers, organizing meetings and capacity building

sessions, doing transit walk involving communities within the gram panchayat. Few of the practices are displayed in the attached pictures.

b. Institutional management practices:

To support the comprehensive management plan of Atal BhujalYojna in the district Faridabad, various institutional arrangements were made involving Panchayati Raj institution, District level administration and state and national level organizations. Under Panchayati Raj institution, office of Sarpanch and Panchayat Secretary were approached for community mobilization and organizing Gram Sabha meetings. From office of the District Administrator were approached for mobilizing the government offices required for secondary data generation and convergence. Irrigation and water resource department at Faridabad has been interested with work of Nodal Agency. DIP is working in close connection to the Nodal agency for implementing the Atal BhujalYojna in the district. For seamless data generation and implementation of Atal BhujalYojna State level and national level organizations were approached including SPMU, Haryana Water Resource Regulatory Authority.

c. Comprehensive plan for participatory management practices:

Participatory management of groundwater resource need proper planning involving the stakeholders at GP level for which key elements are making the invisible groundwater resource visible understanding about private property to common pool property regarding groundwater supply augmentation to demand management. To manage aquifer recharge through village level interventions by preparation of water budget based holistic water management plan and pilot in different parts of the district. The timeline for various activities is given in the below GANTT Chart.

ATAL BHUJAL YOJNA HARYANA- MONTHLY ACTIVITY CHART OF DIP -MRIIRS

Task under ABJYH- Monthly activity chart 1st and 2nd year		1st Year												2nd Year											
		Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
BIDDING																									
LOA																									
1	Establishment of Cluster Office at MRIIRS, Fbd, Appointment /Deployment of Man and Machine																								
	Project Inception -Introductory Meeting with DPMUs and SPMU, obtaining GP list and maps, procurement of data																								
2	Base line data collection and delineation of watershed																								
3	Preparation & submission of Work Plan and Inception Report																								
4	Develop Village Profile and Village Information Center																								
5	Mapping all village institutions like VWSC, WUA,FPO, CBO,WMC, GWMA etc and convergence of all on going Govt schemes with ABJYH Talent hunt events																								
6	Budhsangoshti-Meetings /Workshop/Trainings/ Awareness campaign and Quarterly Report (QR)submission																								
7	Community mobilization events IEC,BCC & IPC and Gramsabha																								
8	Investigations for WSP and Water budget and Implementation																								
9	Interventions for supply & demand side water management and water use efficiency enhancement																								
10	Strengthening of GP institutions and committees, Training and Capacity building, block and district level workshop																								
11	Submission of Annual Report, Approval of WSP, budgets, bills and Annual public disclosure of GW informations																								
Task under ABJYH- Monthly activity chart 3rd and 4th year		3rd Year												4th Year											
		Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	Budhsangoshti-Meetings /Workshop/Trainings/ Awareness campaign and Quarterly Report (QR)submission																								
2	Community mobilization events IEC,BCC & IPC and Gramsabha																								
3	Investigations for WSP and Water budget and Implementation																								
4	Interventions for supply & demand side water management and water use efficiency enhancement																								
5	Strengthening of GP institutions and committees, Training and Capacity building, block and district level workshop																								
6	Submission of Annual Report, Approval of WSP, budgets, bills and Annual public disclosure of GW informations																								
7	Exit - O&M , final bills and Final Report submission																								



Engagement of District Implementing Partner to support in implementation of Atal Bhujal Yojna (Atal Jal) for

**Cluster -06, District – Faridabad & Rewari
(Blocks: Faridabad, Ballabhgarh and Khol)**

4th Quarterly Progress Report

April-June, 2022

Cluster No. 06, Faridabad & Rewari, Haryana

From:

**Centre for Advance Water Technology and Management
Manav Rachna International Institute of Research and
Studies District Implementing Partner
Faridabad, Haryana**

**Submitted to,
Chief Engineer / LCU, Irrigation & water Resource
Department, Haryana, Panchkula**

Quarterly Progress Report

1. Introduction- about atal jal

The Government of Haryana has received financing from World Bank towards the “ Atal Jal , Haryan” . The Irrigation & Water Resource Department, Government of Haryana an implementing agency invited proposals to provide the consulting services “ Engagement of District Implementation Partner to support in Implementation of Atal Bhujal yojna (Atal Jal) for nine clusters of the State.

In tune with it, CAWTM, Manav Rachna International Institute of Research and Studies Faridabad, Haryana is selected to provide consultancy services as “District Implementing Partner to support in implementation of Atal Jal Yojna (Atal Jal) for Cluster No. 06- Faridabad and Rewari (Blocks: Faridabad, Ballabhgarh and Khol)

The project services were commenced from 12th August 2021. Immediately after signing the project contract project offices was established in the cluster. Its address and other communication detail was shared with all the concerned project officials.

2. Details of activities performed during the Quarter:

- a) Meetings for strengthen VWSC members in 26 GPs in Faridabad and 15 in Rewari district- For strengthen the committee in the panchayat, first meets have been planned with committee member including VWSC, Sahiya didi, Asha worker, Anganbari works, Pump operator, Nehru youva kendra members, selfhelp groups. Through this we tried to empower these people for future work and strengthen them by appropriate knowledge.



- b) PRA activities in 26 grampanchyat in Faridabad and 15 in Rewari.

PRA activates are the IEC tool to understand their own village in grater manner, through this activates people can understand their existing scenario, problems areas and planning to resolve. We organise this activates with villagers in 2nd meeting. Transit Walk is also the part of activities for better understanding of morphology, community interaction, agriculture activities, facility and water practices in the grampanchyat.



- c) Jal-Panchyat in 26 different village of Faridabad and 15 at Rewari.
 Jal Panchyat is the 3rd meeting with committee and communities with draft report of WSP. This meeting includes previous meeting outcomes and secondary data reflection. People discuss on solution side for conservation of water and proper utilisation. This is the open forum for discussion on WSP and approval.



- d) MIS feeling and Correction of water security plan with DPMU.
- e) MICADA Data collection in 69 Grampanchyat of Faridabad and 39 in rewari. (Excel sheet Attached)



- f) Field verification by DPMU, NPMU, SPMU and QCI

After submission of 3rd quarter report, this was verified by QCI, NPMU, SPMU and DPMU in respective grampanchyats.



g) Regular Meeting with DPMU for discussion on WSP.

Regular meeting has been by DPMU for discussion on field issues and achievements. We aware about ours way of works and project requirements. Discussion on convergence has been done.



h) Data collection and organised meeting in various villages

i) Short programme on MIS & WSP for concern departments.

- j) Meeting with DC regularly to discuss and update of field issues. DC took once in month meetings at their office in Faridabad and Rewari both. They take review on work process and function of line departments for convergence.



- k) Meeting with Faridabad BDPO.
l) Bite on Radio Manav Rachna -Radio Manav Rachna record the bites of shri Pramod Jain Sir on ABY to promote the projects among the common people. This gives very good influence to Faridabad residents.



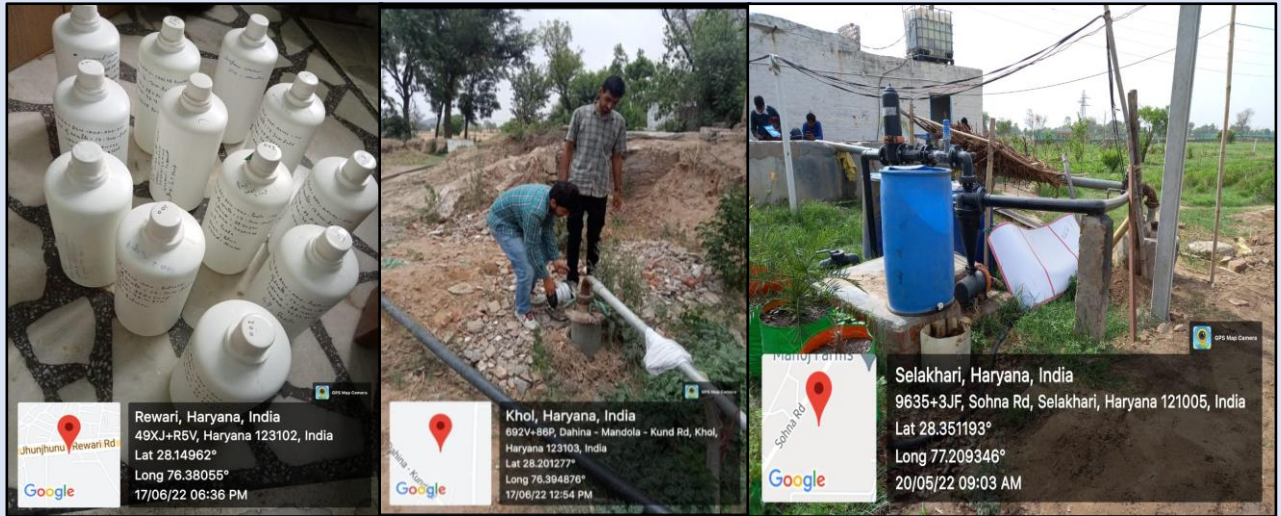
- m) Discuss Various schemes with villagers in supply site and demand site management.



- n) Regular discussion and meetings with MECADA regarding convergence.
- o) Continue working on MIS, Geotagging, well inventory and other WSP related activates
- p) Distribution of Water Test kit if all Grampanchyat of Faridabad and Rewari



q) Collection of water Sample in every village for testing



r) Training and testing of water sample in every grampanchayat



3. Status of Activities Performed up to the Quarter-

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.

4. Status of Deliverables up to the Quarter

S.N.	Deliverables	Status	Nos	Remarks
1.	Weekly Progress Report.	Target achieved	12 @ 4/month	Progress reports submitted timely and participated in review meetings
2.	Preparation of Water Security Plan	Target achieved	15/month total 41 as per above table	Uploaded on MIS after verification from DPMU/SPMU
3	Field verification of WSP previously uploaded	Approved	44 WSP	Verification by DPMU/Reg Off/SPMU/NPMU/ QCI as per schedule
4	Convergence	In progress	108 GPs	Mi-Cada Data collection
5	Re-submission of WSP disqualified in QCI/SPMU verification,	Uploaded	5 (Faridabad) 5 (Rewari)	Submitted

Meeting & discussions:

- a) Organised project concept sharing workshop 'with all the I&WRD Project officials at district level.
- b) Meeting and discussion with line departments officials like Department of Agriculture & welfare, Animal Husbandry & dairying, Forest department, Rural development, Public Health Engineering, Development & Panchayat department, Horticulture, Renewable energy etc.

5. Critical issues identified if any- Deeper groundwater levels in few GPs along with decreasing groundwater trend in the foot hills of Aravalli.

6. Way forward:

- i) Set of activities prepared for next quarter for Implementation of WSP
- ii) Planning of field activities plan for community meeting, and other activities.
- iii) Coordinate NPMU/SPMU/DPMU/QCI for field visits.

News Paper coverage of events under ABY at cluster 06 during the quarter

जल संरक्षण के लिए अन्य विभागों के साथ मिलकर काम करेगी अटल भूजल योजना: डीसी जितेन्द्र यादव

May 26, 2022 by Deepak Sharma

फरीदाबाद (अतुल्य लोकतंत्र) : डीसी जितेन्द्र यादव ने कहा कि भूजल की चुनौतियों और उन चुनौतियों का समाधान करने की कोशिश कर रही अटल भूजल योजना के बारे में जोर दिया जा रहा है। जल प्रबंधन योजनाओं जैसे सूक्ष्म सिंचाई छिड़काव और ड्रिप सिंचाई तथा फसल विविधीकरण को शामिल किया गया है। इसी तरह जल पंचायत में भूजल पुनर्भरण के लिए आपूर्ति पक्षीय प्रबंधन योजना जैसे तालाब कायाकल्प, चेक-डैम, सोक-पिट, वर्षा-जल संचयन की योजना बनाई गई है। इन्हें प्राप्त करने के लिए जिला में उद्देश्य को प्राप्त करने के लिए अन्य आपसी बेहतर तालमेल करके विभाग मिलकर काम करेंगे।

सिंचाई विभाग के अधीक्षक अभियंता राजीव कुमार बत्रा ने विस्तृत जानकारी देते हुए बताया कि अटल भूजल योजना के जिला में कार्यान्वयन भागीदार मानव रचना इंटरनेशनल इंस्टीट्यूट एंड रिसर्च स्टडीज के साथ तालमेल करके पाखल ग्राम पंचायत में जल पंचायत का आयोजन किया गया। भूजल की चुनौतियों और उन चुनौतियों का समाधान करने की कोशिश कर रही अटल भूजल योजना के बारे में जोर दिया गया। उन्होंने उन योजनाओं पर जोर दिया जिन्हें भूजल उपयोग के मांग पक्ष प्रबंधन और आपूर्ति पक्ष प्रबंधन दोनों पर जिला कार्यान्वयन भागीदार द्वारा तैयार की गई, जल सुरक्षा योजनाओं में शामिल किया जाना है। उपस्थित गणमान्य सदस्यों द्वारा मांग पक्ष प्रबंधन योजनाओं जैसे सूक्ष्म सिंचाई (छिड़काव और ड्रिप सिंचाई) और फसल विविधीकरण को शामिल किया गया है। इसी तरह जल पंचायत में भूजल पुनर्भरण के लिए आपूर्ति पक्षीय प्रबंधन योजना जैसे तालाब कायाकल्प, चेक-डैम, सोक-पिट, वर्षा-जल संचयन की योजना बनाई गई है। इन्हें प्राप्त करने के लिए जिला में उद्देश्य को प्राप्त करने के लिए अन्य लाइन विभाग मिलकर काम करेंगे। कार्यक्रम में सिंचाई एवं जल संसाधन विभाग के अधीक्षक अभियंता तथा अटल भूजल योजना, फरीदाबाद जिले के नोडल अधिकारी राजीव कुमार बत्रा ने आगे बताया कि परियोजना का मुख्य उद्देश्य है की समय सीमा में भूजल की घटती दर को 50 प्रतिशत तक कम करना है। कार्यक्रम में राजीव बत्रा ने लोगों के सामने भविष्य में आने वाली भूजल की चुनौतियों और उन चुनौतियों का समाधान करने की कोशिश कर रही अटल भूजल योजना के बारे में जोर दिया।

जिला कार्यक्रम प्रबंधन इकाई के विशेषज्ञों की टीम आतिश एक्का और प्रमोद कुशवाहा के साथ डीआईपी टीम समन्वयक सुश्री स्नेहा राय व उनकी टीम के सदस्य अमित, राहुल पांडे, रवि परमार और देवेंद्र जल पंचायत की सुविधा के लिए उपस्थित थे।



Atal Bhujal Yojana to work in collaboration with other departments for water conservation in Faridabad district: DC Jitendra Yadav

To achieve these, other departments will work together in better coordination to achieve the objective in the district

Hirender Kr. Mandal info@impressivetimes.com

FARIDABAD: DC Jitendra Yadav said that emphasis is being laid on the challenges of groundwater and the Atal Bhujal Yojana which is trying to address those challenges. Water management schemes such as micro irrigation, sprinkler and drip irrigation and crop diversification have been included. Similarly, for ground water recharge in Jal Panchayat, a plan has been made for supply side management plan like pond rejuvenation, check-dam, soak-pit, rain-water harvesting. To achieve these, other departments will work together in better coordination to achieve the objective in the district. Giving detailed information, Superintendent Engineer Irrigation Department.



WATER MANAGEMENT SCHEMES SUCH AS MICRO IRRIGATION, SPRINKLER AND DRIP IRRIGATION AND CROP DIVERSIFICATION HAVE BEEN INCLUDED. SIMILARLY, FOR GROUND WATER RECHARGE IN JAL PANCHAYAT, A PLAN HAS BEEN MADE FOR SUPPLY SIDE MANAGEMENT PLAN LIKE POND REJUVENATION, CHECK-DAM, SOAK-PIT, RAIN-WATER HARVESTING

Rajiv Kumar Batra said that Jal Panchayat was organized in Pakhal Gram Panchayat in coordination with Manav Rachna International Institute and Research Studies, the implementation part-

ner of Atal Bhujal Yojna in the district. Emphasis was laid on the challenges of groundwater and the Atal Bhujal Yojana trying to address those challenges. He emphasized on the plans which have to be included in the water security plans prepared by the District Implementation Partner on both demand side management and supply side management of ground water use. Demand side management schemes like micro irrigation (sprinkling and drip irrigation) and crop diversification have been included by the dignitaries present. Similarly, for ground water recharge in Jal Panchayat, a plan has been made for supply side management plan like pond rejuvenation, check-dam, soak-pit, rain-water harvesting. To achieve these other line departments will

work together to achieve the objective in the district. In the program, Superintendent Engineer of Irrigation and Water Resources Department and Nodal Officer of Atal Bhujal Yojna, Faridabad district, Rajiv Kumar Batra further informed that the main objective of the project is to reduce the depletion rate of ground water by 50 percent within the time limit. In the program, Rajiv Batra stressed about the future challenges of groundwater before the people and the Atal Bhujal Yojana trying to solve those challenges. DIP team coordinator Ms. Sneha Rai and her team members Amit, Rahul Pandey, Ravi Parmar and Devendra Jal Panchayat were present along with team of expert of District Program Management Unit, Aatish Ekka and Pramod Kushwaha.

जल संरक्षण के लिए सभी विभाग मिलकर काम करें: उपायुक्त

फरीदाबाद। उपायुक्त जितेंद्र यादव ने कहा कि भूजल की समस्या को देखते हुए अटल भूजल योजना पर काम चल रहा है। जल प्रबंधन योजनाओं जैसे सूक्ष्म सिंचाई छिड़काव और ड्रिप सिंचाई तथा फसल विविधीकरण को इसमें शामिल किया गया है। इसी तरह पंचायतों में तालाब कायाकल्प, चेक-डैम, वर्षा-जलसंचयन की योजना बनाई गई है। जिले में उद्देश्य को प्राप्त करने के लिए सभी विभाग मिलकर काम करें।

सिंचाई विभाग के अधीक्षक अभियंता राजीव कुमार बत्रा ने बताया कि अटल भूजल योजना के जिला में कार्यान्वयन भागीदार मानव रचना इंटरनेशनल इंस्टीट्यूट एंड रिसर्च स्टडीज के साथ पाखल ग्राम पंचायत में जल पंचायत का आयोजन किया गया। भूजल के लिए तालाब कायाकल्प, चेक-डैम व वर्षा-जल संचयन की योजना बनाई गई है। परियोजना का मुख्य उद्देश्य भूजल की घटती दर को 50 प्रतिशत तक कम करना है। ब्यूरो

फरीदाबाद जिले में जल संरक्षण के लिए अन्य विभागों के साथ मिलकर काम करेगी अटल

भारत दयाल खंडेलकर, गुडन्यूज टूडे

फरीदाबाद। डीसी जितेन्द्र यादव ने कहा कि भूजल की चुनौतियों और उन चुनौतियों का समाधान करने की कोशिश कर रही अटल भूजल योजना के बारे में जोर दिया जा रहा है। जल प्रबंधन योजनाओं जैसे सूक्ष्म सिंचाई छिड़काव और ड्रिप सिंचाई तथा फसल विविधीकरण को शामिल किया गया है। इसी तरह जल पंचायत में भूजल पुनर्भरण के लिए आपूर्ति पक्षीय प्रबंधन योजना जैसे तालाब कायाकल्प, चेक-डैम, सोक-पिट, वर्षा-जल संचयन की योजना बनाई गई है। इन्हें प्राप्त करने के लिए अन्य आपसी बेहतर तालमेल करके विभाग मिलकर काम करेंगे।

सिंचाई विभाग के अधीक्षक अभियंता राजीव कुमार बत्रा ने विस्तृत जानकारी देते हुए बताया कि अटल भूजल योजना के जिला में कार्यान्वयन भागीदार मानव रचना इंटरनेशनल इंस्टीट्यूट एंड रिसर्च स्टडीज के साथ तालमेल करके पाखल ग्राम पंचायत में जल पंचायत का आयोजन किया गया। भूजल की चुनौतियों और उन चुनौतियों का समाधान करने की कोशिश कर रही अटल भूजल योजना के बारे में जोर दिया गया। उन्होंने उन योजनाओं पर जोर दिया जिन्हें भूजल उपयोग के



मांग पक्ष प्रबंधन और आपूर्ति पक्ष प्रबंधन दोनों पर जिला कार्यान्वयन सूरक्षा योजनाओं में शामिल किया

जा है। उपायुक्त यादव ने कहा कि भूजल की चुनौतियों और उन चुनौतियों का समाधान करने की कोशिश कर रही अटल भूजल योजना के बारे में जोर दिया जा रहा है। जल प्रबंधन योजनाओं जैसे सूक्ष्म सिंचाई छिड़काव और ड्रिप सिंचाई तथा फसल विविधीकरण को इसमें शामिल किया गया है। इसी तरह पंचायतों में तालाब कायाकल्प, चेक-डैम, वर्षा-जलसंचयन की योजना बनाई गई है। जिले में उद्देश्य को प्राप्त करने के लिए सभी विभाग मिलकर काम करें।

सिंचाई एवं जल संसाधन विभाग के अधीक्षक अभियंता तथा अटल

स्नेहा राय व उनकी टीम के सदस्य अमित, राहुल पांडे, रवि परमार और देवेंद्र जल पंचायत की सुविधा के लिए उपस्थित थे।

Quarterly work Report: Faridabad- Rewari cluster-06

Table -1 Work done report from April to June, 2022

S. No.	Activity	Details	Targets	Achieved	Outcomes	Remarks (if any)
1	WSP	Jal Panchayat	41+10	41+10	Water budget prepared	
1.1		GS resolution	41+10	41+10		Completed
1.2		DPMU approval	41+10	41+10		
1.3		WSP uploaded	41+10	41+10		
1.4		DLI 3 intervention	100%	Proposed in 108 GP's		Coordinate with line department
1.5		DLI 4 intervention	100%	Proposed in 108 GP's		Coordinate with line department
1.6		PRA	41	41		
1.7		Aquifer mapping	41	41		
1.8		Ground water monitoring well identification		48+71=119		Document attached
1.9		MICADA Registration				Document collected
1.10		Aquifer Map datasheet share to DPMU	41	41		
1.11		Co-ordination/meetings with concern departments/DPMU/DC		18		Monthly 2meeting with DPMU and one with DC in both the district.
1.12		Radio bite under IEC		5/day		On radio Manav Rachna
2	Facilitation of C B meetings at GP level		41	41		

3	Facilitation of IEC activities				
3.1	Community mobilization events	41	41		
3.2	Poster placed in public place	-	41GP		Banner Display
3.3	Pamphlet distributed	-	41GP		MICADA, ABY
3.4	Awareness with Youth	-	41		
3.5	Awareness with Women	41	41		
4	HMN data				
4.1	Well inventory 50% of existing		628+635= 1263		Excel sheet attached in annexure
4.2	Geotagging of Pounds		37+71= 108		Data attached in Annexure
5	Institutional				
5.1	Meeting with line dept	As required	45	Secondary data collection and discuss	For Data collation And convergence
5.2	Collaborated events with MICADA	-	4		Awareness for Micro irrigation
6	Implementation				
6.1	DLI 3 implementation				On progress
6.2	DLI 4 implementation				On progress
6.3	Distribution of water test Kit	108	108		
6.4	Water Sample Collection	108*2	108*2		
6.5	Sample testing at GP level	108GP	108GP		In All GP's
6.6	WFM		49+95= 115		

Table 2: Future Work Plan from April 2022 to June 2022

1. **Set of activities prepared for next quarter for consignment of WSP**
2. Consolidation of field activates w.r.t convergence refer in WSP
3. Coordinate with line departments for supply side and demand side implementation.
4. Regular meeting with DPMU and DC.
5. Meeting with line departments for proper convergence.
6. Regular meeting with communities and non-committee members for awareness.
7. Contact all Sarpanch and gram security for different activities.
8. IEC activities in Grampanchayat.
9. Identify the problems cover under ABY if anything new.
10. Collection of water sample for Lab test and submitted to PHED
11. Collection of water sample for testing in every village.
12. Regular Monitor the identified wells for water level.
13. Geotagging of all new recharge structure.
14. Demond side data collection.
15. Training on Testing Kit in remaining Grampanchayat
16. Support to DPMU for establishment of Range gauge station
17. Monitoring Range gauge in monsoon in every Grampanchat.
18. Regular collection of NOC's for WFM.
19. Monthly meeting with VWSC committee members.
20. Compilation of Monthly Plan.
21. Coordination with DPMU/SPMU/NPMU/QCI for WSP verification in all 72 Grampanchayat
22. MICADA data collection and coordination with DPMU for implementation of micro-irrigation in every grampanchayat

Table 3: Quarterly WSP submitted:

Quarterly WSP Submitted			
1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
8	15	44	41

Annexure:

1. EC-PH data
2. DLI-3 & DLI-4 convergence
3. MICADA
4. Monitoring Well
5. MIDADA
6. List of test kit
7. List of Water sample collection
8. List of test results at GP level

ATAL BHUJAL YOJANA
District Implementation Partner
Cluster-06
(Faridabad- Rewari Districts)

**Centre for Advance Water Technology and
Management**
**Manav Rachna International Institute of
Research and Studies**
Faridabad, India
17th Sept 2021

सतत भूजल विकास एवं सहभागी भूजल प्रबंधन हेतु

भारत सरकार प्रायोजित, विश्व बैंक समर्थित, हरियाणा सिंचाई एवं जल संसाधन विभाग द्वारा संचालित

अटलभूजल योजना, हरियाणा

क्रियान्वयन:

उन्नत जल प्रौद्योगिकी एवं प्रबंधन केंद्र,

मानव रचना अंतरराष्ट्रीय अनुसंधान एवं अध्ययन संस्थान, फरीदाबाद



**Manav Rachna International
Institute of Research and Studies**
Deemed to be University under section
3 of the UGC Act, 1956



- ग्राम पंचायत स्तरीय जल बजट निर्धारण
- ग्राम पंचायत स्तरीय जल सुरक्षा योजना तैयार करना
- हितधारक स्तरीय क्षमता विकास और प्रशिक्षण
- जल संबंधी वांछित व्यवहार परिवर्तन को बढ़ाना
- ग्रामीण जल समितियों का संस्थागत सुदृढीकरण
- जल उपयोग दक्षता में सुधार

Manav Rachna-CAWTM, Faridabad



Established in April 2017, out come of study made by MRIIRS on environmental deterioration due to drying of *Badkhal lake*

VISION: “सदा सबके लिए शुद्ध जल”
“ Clean water for all forever”

Activities

1. R&D Studies
2. Technical Interventions
3. Training and Capacity Building
4. Out reach programs
5. Product and Innovation



Project Area for MRCAWTM

- Based on the techno-commercial evaluation of submitted bids, MRCAWTM has been selected for two clusters namely cluster -06 and 07.
- The **cluster- 06** covers **three blocks** of two district i.e. **Khol block of Rewari** district and **Faridabad & Ballabhgarh blocks** of Faridabad district.
- The clusters cover 111 GP having a total area of **about 1226km²**.
- **Faridabad (30 GP)& Ballabhgarh (41GP)**

Manpower Deployment

	MANDATORY POSTS	Faridabad & Rewari
1	Geologist	2
2	Agriculture Expert	1
3	Civil Engineer	1
4	IEC Expert	3
		07
5	Community Worker	9
6	Back office staff	2
7	Project Management Team	2

Team of MRCAWTM

Team

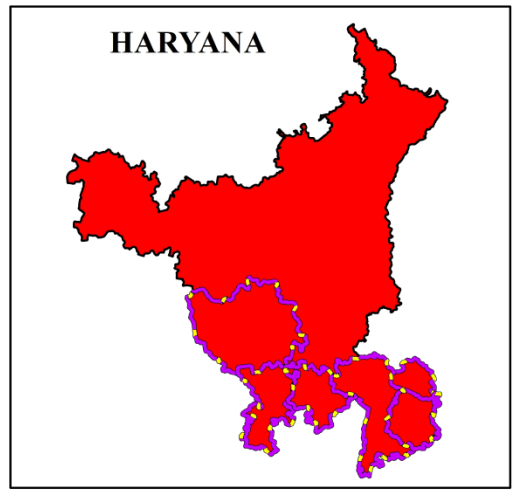
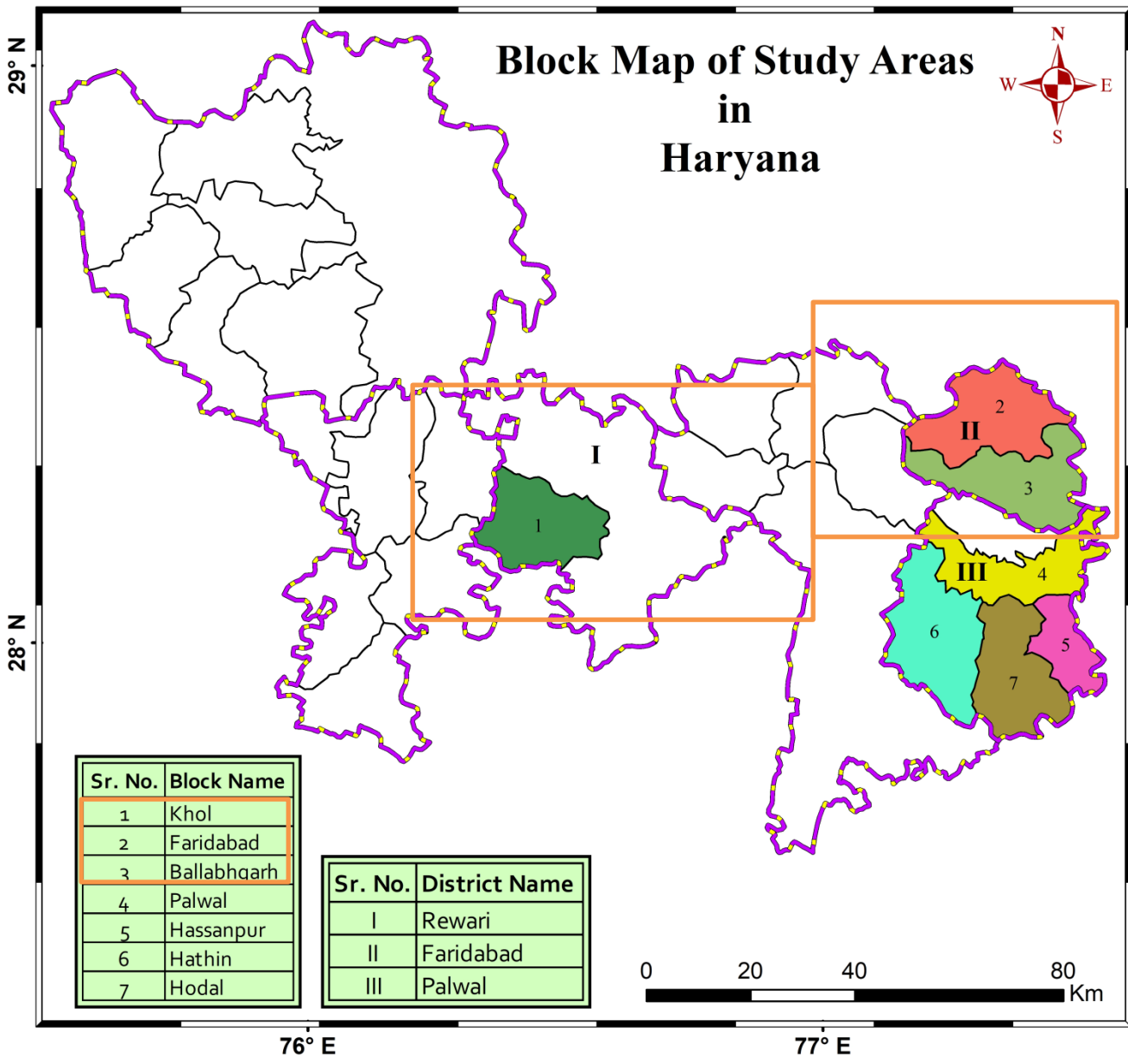
- **Chair Professor** : Dr Dipankar Saha, Former Member CGWB and Member Secretary CGWA
- **Director** : Dr Arunangshu Mukherjee, Professor, ES&E & Former Scientist, CGWB
- **Associates** : Mrs Shena Rai, Dr HS Saini, Dr Nidhi Didwania
- **Research A** : Ms Alifia Ibkar, Ms Khushboo Singh

District Implementation Partner(DIP) under Atal Bhujal Yojana, Haryana , IWRD

Cluster 06 : Team (Faridabad-Rewari)			
Post	Name	Mail Id	Contact No
Hydrogeologist	Akshay	Akshayloohach1994@gmail.com	7206247546
	Sandeep Puniya	sandeepunia2017@gmail.com	9671306328
Agriculture specialist	Rahul Pandey	Pandeyrp15@gmail.com	9452952015
Water conservation specialist	Prabir Mondal	Hetc.probir@gmail.com	9958247496
IEC Expert	Mahesh	mkr849441@gmail.com	8059012054
	Ravi Ku Parmar	Raviparmar2511@gmail.com	8744069485
	Vaishali Mathur	vaishalimathur78@gmail.com	9990455824
Team Leader, CI 06: Akshay, Akshayloohach1994@gmail.com , 8090421830			

Team Coordinator: Ms Sneha Rai, Assistant Professor, ES&E, MRIIRS, Faridabad 121001,
sneharai.fet@mriu.edu.in 8084136477

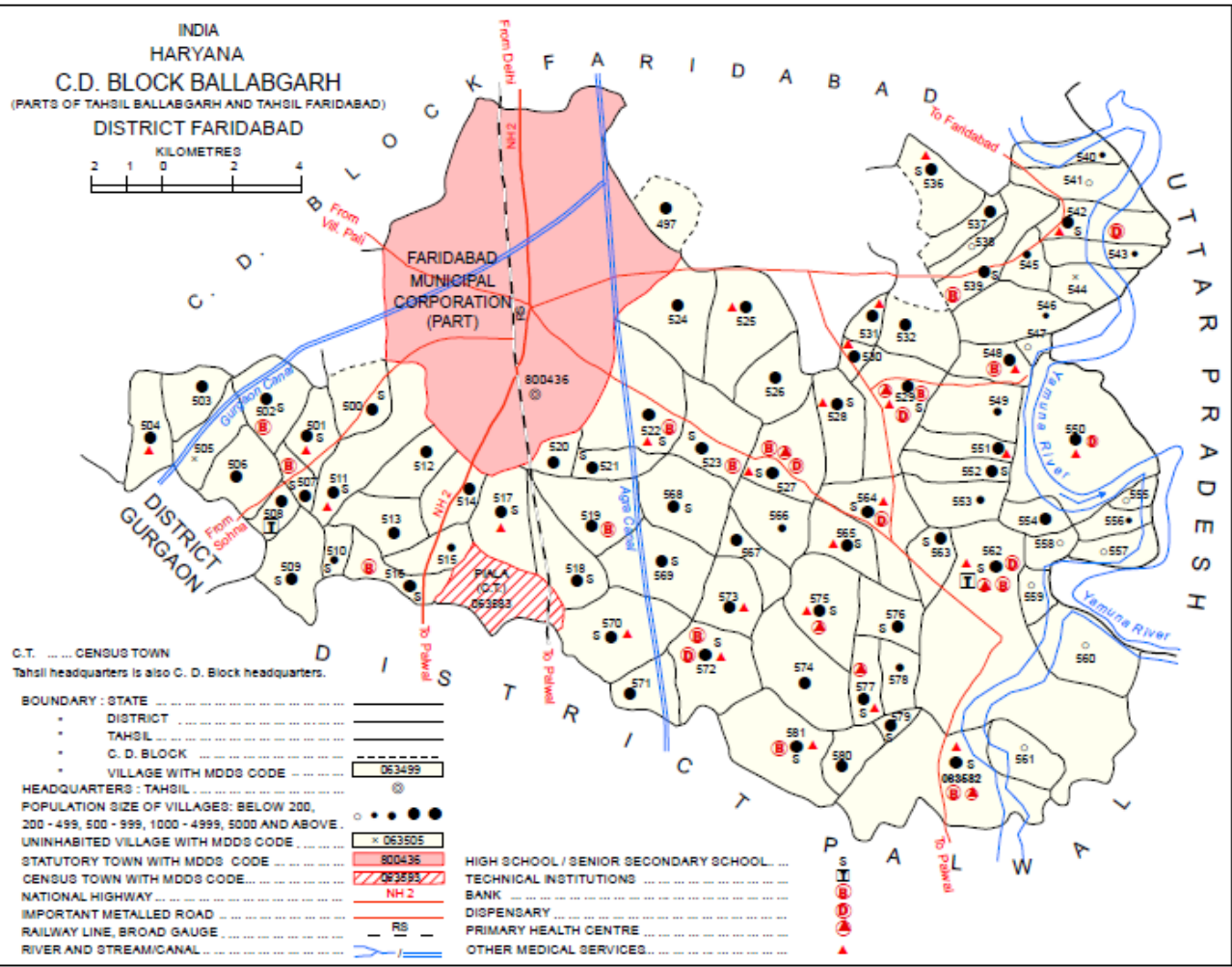
Project In charge: Dr Arunangshu Mukherjee, Prof & Head, ES&E and Director, CAWTM, MRIIRS,
arunangshu.fet@mriu.edu.in, 9968805450



Ballabhgarh Block Map

Total 41 GP

BALLABHGARH			
1	77.33553	28.24335	63578 Ahmadpur(62)
2	77.41995	28.29516	63564 Atali(89)
3	77.40555	28.2276	63580 Aterna(60)
4	77.37731	28.28178	63567 Bahbalpur(69)
5	77.26259	28.29012	63511 Bhanakpur(45)
6	77.20302	28.30484	63505 Auli(37)
7	77.46413	28.25972	63558 Bhikuka(198)
8	77.3881	28.30234	63566 Phophunda(68)
9	77.34539	28.26067	63570 Deeg(56)
10	77.37147	28.25743	63572 Fatehpur Biloch(58)
11	77.23881	28.31055	63502 Ferozepur Kalan(41)
12	77.40758	28.28989	63565 Garkhera (67)
13	77.2474	28.27187	63510 Harphala (47)
14	77.42768	28.23966	63579 Hirapur(61)
15	77.31024	28.29329	63517 Jajru(52)
16	77.39575	28.23241	63581 Jawan(59)
17	77.48755	28.23886	63562 Chhainsa(202)
18	77.23934	28.29159	63508 Kabulpur Bangar(39)
19	77.30108	28.29267	63514 Kail Gaon(51)
20	77.26611	28.31544	63501 Kamera(42)
21	77.28686	28.30491	63512 Khandawali(50)
22	77.22582	28.29642	63506 Ladihapur(38)
23	77.3716	28.26702	63573 Ladoli(70)
24	77.26428	28.27604	63509 Mohla(46)
25	77.44488	28.22304	63560 Walipur(201)
26	77.4354	28.28896	63563 Mojpur(88)
27	77.27899	28.28102	63513 Nagla Jogian(49)
28	77.42006	28.26601	63576 Narhawali(66)
29	77.41647	28.25303	63577 Naryala(63)
30	77.3928	28.25651	63574 Panehra Kalan(64)
31	77.40113	28.26805	63575 Panehra Khurd(65)
32	77.34732	28.24601	63571 Deeg (57)
33	77.31192	28.26655	63583 Piala (54) (CT)
34	77.33035	28.27653	63518 Sagarpur(55)
35	77.28406	28.32156	63500 Samaypur(43)
36	77.35554	28.28085	63569 Shahpur Kalan(71)
37	77.30046	28.27865	63515 Sahapur Khurd (53)
38	77.28651	28.27491	63516 Sikri(48)
39	77.25395	28.30482	63507 Sikrona(40)
40	77.34065	28.28619	63519 Sunper(72)
41	77.20993	28.31484	63503 Zakopur(36)



GOAL OF ATALJAL HARYANA

The goal of Atal Bhujal Yojana is to demonstrate community-led sustainable ground water management in select water stressed areas of Haryana

- **Household?**
 - Reliable services
 - Health
- **Community?**
 - Resilience to disasters
 - Vulnerability of economy
- **National?**
 - survival of the state and nation?
- **Environmental?**
 - Ecological survival, from local to planet

-----What is meant by water security?

A definition of water security

- The reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks.(Grey and Sadoff (2007)).
- Not the same as ‘food security’ and ‘energy security’,
 - reliable access to sufficient supplies.
 - water security also captures destructive aspects of water
- floods and droughts

Summarized scope of work

- Preparation of water budget of each GP annually
- Preparation of GP wise water security plan annually and
- IEC based behavioral change in stakeholders regarding water use efficiency and sustainability.

Detailed scope of work

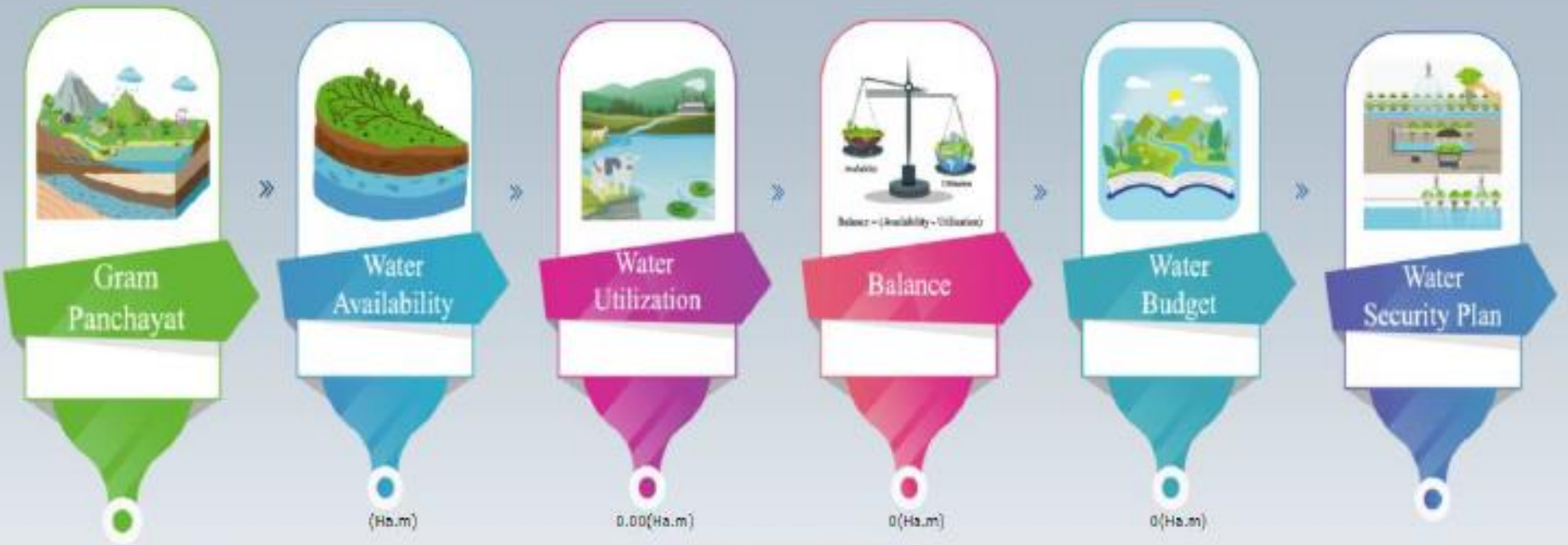
Sno	TASK	SUSTAINABLE MANAGEMENT OF GROUNDWATER				
1	GP level WSPs & Water Budgeting	Data collection	Formulation of WSP	Annual approval of WSPs	Recommendations	Implementations
2	Capacity Building/ Training	Stakeholder level (Monthly)	GP level (Quarterly)	Block level (Annually)	District level (Annually)	
3	Meeting /Workshop/ Mass awarness	Stakeholder level (Monthly)	GP level (Bi-monthly)	Block level (Six monthly)	DPMU level (Annually)	SPMU level (Annually)
4	Report Submission	Inception Report (1)	Report on Public disclouser of information on GW (4)	Quarterly progress reports (16)	Reports on WSPs (4)	Final Report (1)
		Preparation of village profile with base line data all 296 GP	Training reports of all training conducted	Documentation of best practices, lessons, effective practices		

Detailed scope of work

5	Strengthening of GP level Institutions	Develop Village Information Center -296 numbers	Preparation of Annual action Plan and Budget for GP and assistance in Audit	Preparation of district specific communication BCC plan	Build the capacity of VWSC,CBO, Village Govt Officials, talent hunt	Site selection for Monitoring Network Establishment
6	Development Participatory GW Management System	Awareness through mobile van at 296 GP level	IEC tool kit for facilitate efficient use of water	Preparation of App to reaching all HHs for active participation	Establish community monitoring mechanism at GP level	

METHODOLOGY

at Gram Panchayat level (GP)
Under cluster- Faridabad- Rewari- CL06



ATAL BHUJAL YOJNA HARYANA- MONTHLY ACTIVITY CHART OF DIP -MRIIRS

Task under ABJYH- Monthly activity chart 1st and 2nd year		1st Year												2nd Year											
		Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
BIDDING																									
LOA																									
1	Establishment of Cluster Office at MRIIRS, Fbd, Appointment /Deployment of Man and Machine																								
	Project Inception -Introductory Meeting with DPMUs and SPMU, obtaining GP list and maps, procurement of data																								
2	Base line data collection and delineation of watershed																								
3	Preparation & submission of Work Plan and Inception Report																								
4	Develop Village Profile and Village Information Center																								
5	Mapping all village institutions like VWSC, WUA,FPO, CBO,WMC, GWMA etc and convergence of all on going Govt schemes with ABJYH, Talent hunt events																								
6	Budhsangoshti-Meetings /Workshop/Trainings/ Awareness campaign and Quarterly Report (QR)submission																								
7	Community mobilization events IEC,BCC & IPC and Gramsabha																								
8	Investigations for WSP and Water budget and Implementation																								
9	Interventions for supply & demand side water management and water use efficiency enhancement																								
10	Strengthening of GP institutions and committees, Training and Capacity building, block and district level workshop																								
11	Submission of Annual Report, Approval of WSP, budgets, bills and Annual public discloser of GW informations																								
Task under ABJYH- Monthly activity chart 3rd and 4th year		3rd Year												4th Year											
		Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	Budhsangoshti-Meetings /Workshop/Trainings/ Awareness campaign and Quarterly Report (QR)submission																								
2	Community mobilization events IEC,BCC & IPC and Gramsabha																								
3	Investigations for WSP and Water budget and Implementation																								
4	Interventions for supply & demand side water management and water use efficiency enhancement																								
5	Strengthening of GP institutions and committees, Training and Capacity building, block and district level workshop																								
6	Submission of Annual Report, Approval of WSP, budgets, bills and Annual public discloser of GW informations																								
7	Exit - O&M , final bills and Final Report submission																								

Atal Bhujal Yojana Haryana- Quarterly activity chart of individuals experts for Cluster -06 & 07, DIP- MRIIRS

Professional	Quarter-	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Groundwater Specialist /Hydro geologist	G1	1,2	2,4,5,7,	2,4,5,7,9	2,4,5,6,9	2,4,5,6,9	2,4,7,9	4,7,9,11	6,7,9,11,	6,7,9,11,	4,6,7,11,	4,6,7,11,	6,7,9,11,	6,7,9,11,	6,7,9,11,	11	11
	G2	1,2	2,4,5,7,	2,4,5,7,9	2,4,5,6,9	2,4,5,6,9	2,4,7,9	4,7,9,11	6,7,9,11,	6,7,9,11,	4,6,7,11,	4,6,7,11,	6,7,9,11,	6,7,9,11,	6,7,9,11,	11	11
	G3	1,2	2,4,5,7	2,4,5,7,9	2,4,5,6,9	2,4,5,6,9	2,4,7,9	4,7,9,11	6,7,9,11,	6,7,9,11,	4,6,7,11,	4,6,7,11,	6,7,9,11,	6,7,9,11,	6,7,9,11,	11	11
	G4	1,2	2,4,5,7	2,4,5,7,9	2,4,5,6,9	2,4,5,6,9	2,4,7,9	4,7,9,11	6,7,9,11,	6,7,9,11,	4,6,7,11,	4,6,7,11,	6,7,9,11,	6,7,9,11,	6,7,9,11,	11	11
Water conservation Specialist	W1	1,2	1,6	1,6	6,9,10,11,	6,9,10,11,	9,10,11,	7,9,10,11,	7,9,10,11,	9,10,11,	9,10,11,	9,10,11,	8,9,10,11,	8,9,10,11,	8,9,10,11,	10,11	11
	W2	1,2	1,6	1,6	6,9,10,11,	6,9,10,11,	9,10,11,	7,9,10,11,	7,9,10,11,	9,10,11,	9,10,11,	9,10,11,	8,9,10,11,	8,9,10,11,	8,9,10,11,	10,11	11
Agriculture Specialist	A1	1,2	2,5,9	2,5,9	2,5,9	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	11	11
	A2	1,2	2,5,9	2,5,9	2,5,9	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	5,7,9,	11	11
IEC Cum Social Development Specialist	IEC1	1,2,3,	2,3,4,9	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11
	IEC2	1,2,3,	2,3,4,9,	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11
	IEC3	1,2,3,	2,3,4,9,	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11
	IEC4	1,2,3,	2,3,4,9,	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11
	IEC5	1,2,3,	2,3,4,9,	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11
	IEC6	1,2,3,	2,3,4,9,	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11
	IEC7	1,2,3,	2,3,4,9,	2,3,4,9,	2,3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	3,4,9,	11	11

Block wise Deployment of Experts						
Faridabad	Ballabhgarh	Khol	Palwal	Hodal	Hathin	Hassanpur
Cluster -06			Cluster - 07			
G1	G1 &G2	G2	G3	G3	G4	G4
W1	W1	W1	W2	W2	W2	W2
A1	A1	A1	A2	A2	A2	A2
I1	I2	I3	I4	I5	I6	I7

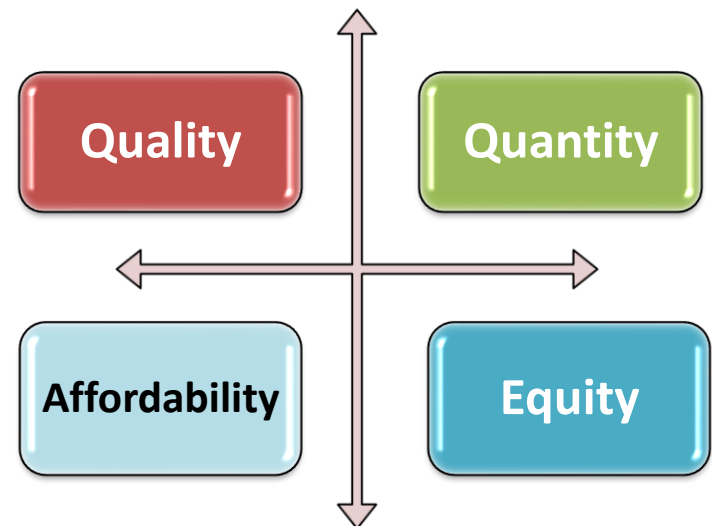
List of activities under scope of DIP	
1	Preparation of inception report and work plan
2	Preparation of baseline report (Ref. to DLIs)
3	IEC campaign
4	Community mobilization and Strengthening of village / GP level institutions (GP / VWSC/ CBOs)
5	Facilitate participatory assessment and preparation of WSPs
6	Implementation preparation
7	Implementation facilitation
8	Exit & O & M
9	Capacity building
10	Providing assistance in financial and admin management
11	Documentation and reporting

Water Security



- Key indicators of water security risks:
 - Water Scarcity;
 - Floods;
 - Inadequate Water Supply and Sanitation;
 - Ecosystem Degradation and Pollution.

* Implementation measurement to make the water security on the ground :



Water Security Planning Process

Step 1 :

- District/Block level meeting of Sarpanches.
- Constitution / Adoption of Water Management Committee (WMC)
- Orientation on Atal Jal Program.
- Campaigns
- DIP consultation with constituent villages of GP.
- GP meeting to fix date for the People's Workshop; GP sends Invites to opinion leaders (10/village)
- Baseline data collection

Step 3 : Preparing Water Security Plan (WSP).

- Village level meetings to chalk out Demand Decrease Plan (DDP) and Supply Increase Plan (SIP).
- DIP and WMC facilitates meetings. Transect walks of WMC-DIP to sites suggested for SIP along with key stakeholders and technical personnel from DPMU. GP level meeting: Discussion and finalization of DDP. Social Feasibility Report on SIP by DIP-WMC. Technical Feasibility Report on SIP by DPMU Technical Team. GP level meeting: Discussion on feasibility reports and finalization of SIP.

Step 6

- Social and Environmental Audit

Step 2

- Social Mobilization and stakeholders Consultation
- Participatory Workshops on data collection
- Water Balance: Presentation;
- Group work on ways and means to reduce groundwater demand and increase groundwater recharge;
- Workshop by DIP and WMC at the village level to explore options of demand and supply management.

Step 4

- Compilation of Draft WSP by DIP-WMC, Submission to GP
- Consolidation and Finalization of Water Security Plan – Consultative Process
- DPMU Review of WSP by GP and DPMU. Revision of WSP by DIP-WMC.
- Draft WSP presented in Gram Sabha by the GP and a resolution is passed to approve the WSP and sent to DPMU.
- WSP fully complied, along with acknowledgement and Gram Sabha Resolution. Sent to DPMU.
- Approval of WSP by DPMU. Insertion of "Declaration" page. Sharing of approved WSP with GP, SPMU, NPMU and MIS Team
- Approvals by Competent authority

Data Collection Protocol

- A. Gram Panchayat Info :
 - A-I : Demographic Profile
 - A-II : land Use
 - A-III : Irrigated Area / Crops
 - MIS form /Additional Data Sheet
 - A-IV : Water Use Scenario
 - A-V : water Efficient Practices
 - A-VI : WSP related info

Data Entry Protocol Steps

- D. Water Security Plan Module
 - Water Availability
 - Water Utilization
 - Water Balance
 - Water Budget
 - Water Security Plan
- E. Environmental Monitoring
- F. Gender Related Data

Strategies for Preparation of WSP

Step-I

- Formulation and Introduction of DIP teams 13-14 Aug 2021
- Participated in the **Orientation workshop** organized by SPMU for DIPs- 16th Aug 21
- Deployment of Teams on Field, setting of field office
- Meeting with **DPMU Sh Rajeev Batra**, SE, YWSC Faridabad 24th Aug 21 and discussions with ABY District GW Expert Sh P Kushwah, and introduction of team
- Meeting with Gramsabha Head(BDPO/ADPO) about objective of ABY
- Started data collection involving SPMU, DPMU, Govt Depts, PRIs on aspects of **Water Budgeting** as per the MIS and data collection protocol
- Interactions with SPMU, Feed back shearing, receiving instructions
- Visit to **selected villages**, interactions with community collected data, photo
- Planning for use of **Manav Rachna FM Radio** for Awareness, scheduling of program, content preparation, expert selection, collection of bits
- Involvement of Mass Communication- Journalism Faculties & students and micro level planning, Initiated a **competition for banner deign** for ABY
- Involving **O P Bhalla Foundation and Media cell** of Manav Rachna in Awareness Campaign

Strategies for Preparation of WSP

Step-II

- Recognizing and introduction with village level WSCs in all the GPs.
- Micro planning with VWSCs.
- Ensured participation of women and vulnerable groups through attendance in meetings.
- Data collection and data entry in the MIS as per the protocol.
- Assessment of Supply side and Demand side water requirements
- WSP to be prepared on the basis of water budget.
- WSP to be prepared to meet the specific challenges in the GP involving water-related investments / interventions.

WATER BALANCE EQUATION

$$\text{INFLOW} - \text{OUT FLOW} \pm \text{STORAGE} = \text{ZERO}$$

Components of GP level Inflow (+ Data Requirements)

- GP Area x Rainfall (Village wise list of Rain gauge Stations & data)
- Total Water Transfer to GP (By Canal, Tanker etc)
- Land use pattern of GP (Land records)
- Rate of Infiltration (Soil type)
- Return Flow through applied irrigation (Cropping and Irrigation data)
- Recharge through RWH & AR Structures (No of ponds, check dam etc, IWSM & MNREGA water storage structures)
- Water Reuse & Recycle (Grey water use, Industrial reuse)
- GP Water level Monitoring data (CGWB, State GW dept, PRI, IWSM)
- GP wise water quality data (PHED, PRIs)

TOTAL WATER AVAILABILITY at GP

WATER BALANCE EQUATION

$$\text{INFLOW} - \text{OUT FLOW} \pm \text{STORAGE} = \text{ZERO}$$

Components of GP level Out flow (+ Data Requirements)

- **GP level Water use (Domestic + Industrial + Irrigation)**
(Census data, BPL-APL Data, Livestock census data, Industrial water consumption)
- **Total Water Transfer from GP** (By Tanker, pipe line etc)
- **Land use pattern** (Net & Gross sworn area, Irrigated area etc)
- **Cropping Pattern** (Kharif, Ravi and Summer crops area + type)
- **Irrigation Pattern** (Surface and Groundwater Irrigation data, Micro Irrigation data- area and crop wise)
- **Micro irrigation Census data** (No of water well, pump used etc)
- **Saline water use data** (Irrigation and S&WC)

TOTAL WATER UTILIZATION at GP

GW Level & Rainfall Monitoring

- **Piezometers** (well for water level monitoring) to be drilled in Govt building premises at each GP
- Digital Water Level Recorders (**DWLR**) will be installed in these Pz.
- Automatic **Rain Gauge** Station also will be installed in each GP along with every Pz.
- Identification of **safe premises** required and-
- NOC required from concern departments
- Intervention of District Administration requested

WATER SECURITY PLAN (WSP)

- DIP have to formulate GP wise WSP on participatory mode
- Grame Sabh has to approve the plan first based on the GP level requirements
- DPMU has to accept the approved WSP
- The recommendations of accepted WSP has to be implemented through convergence of scheme
- Impact of scheme has to be monitored by DIP

Convergence of schemes

- ABY is to be linked with all existing schemes of water utilization, water storage-conservation, climate change, water use efficiency of Local body, State and Centrally funded scheme
- Convergence is required at
 - Technical
 - Financial
 - Infrastructure level
- Line Department are: **PHED**-JJM, **Irrigation**-MPMV, **Rural Development**-MGNEGA, IWSM, **Forest**-IWSM, **Soil &WC** Dept-soak pit, **Agriculture**- subsidies, **Nehru Yuva Kendra**-IEC, **PRIs**- Grey water management, Solid waste management, VWSC
- **ABY Haryana** will earn incentives from center based on implementation by convergence

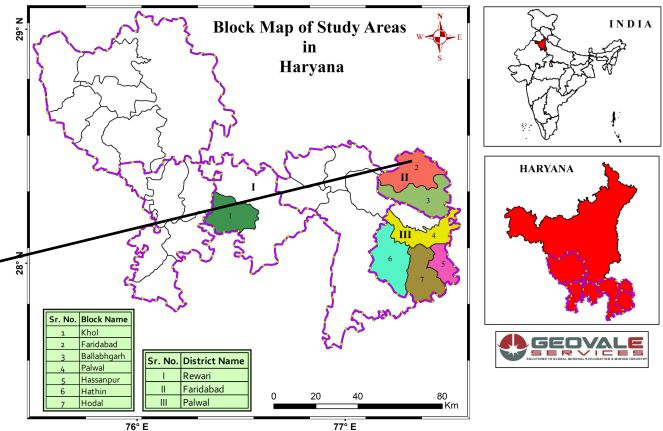
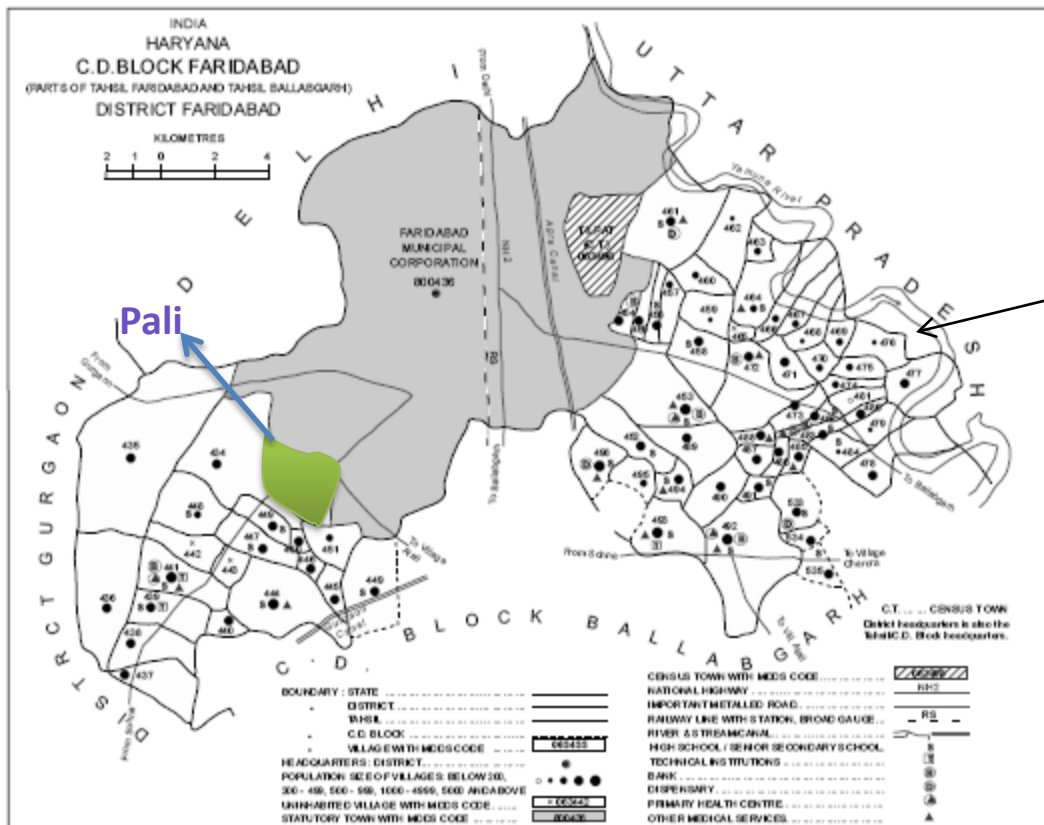
Participatory GW Management

- GP level accepted WSP has to be adopted and managed by the VWSC/WUA under participatory mode
- Strengthening and Capacity building of village level institution has to be taken up by DIP
- GP level water monitoring group to be created
- Behavioral change to improve water use efficiency is to be achieved

PALI

Block & District Faridabad,(Cluster-06)

- Pali(63433) 77.2442E, 28.37973N



Geomorphology-

Aravali hills and Yamuna plains

Geology-

Yamuna Alluvium and Alwar
Quartzite

Av. Rainfall- 600mm/yr

Water budget index- Negative



हरना मन्दिर

चौक

हरना मंदिर पाना

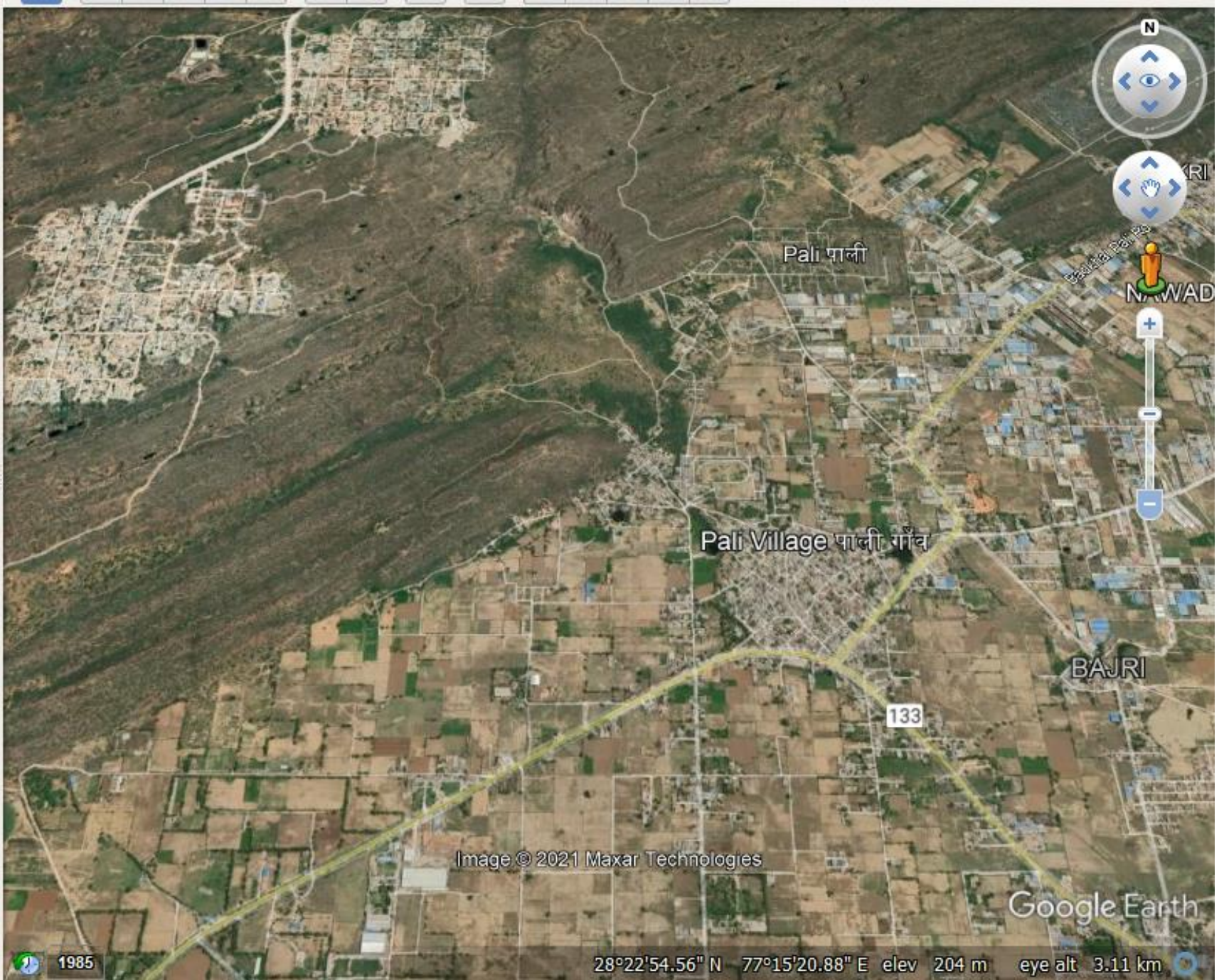
हरना मन्दिर

	700	1000	1500	2000
Top	1800	1800	1800	1800
Tub	3	3	3	3
Well	10	10	10	10
Water Dept	100 ft	100 ft	100 ft	100 ft
Pond	4	4	4	4
Sumo & group	10	10	10	10
School	3	3	3	3
PHC	1	1	1	1
Bank	1	1	1	1

Bank - 1 gram bank

PALI Pics





Pali पाली

Pali Village पाली गाँव

BAJRI

133

Image © 2021 Maxar Technologies

Google Earth

1985

28°22'54.56" N 77°15'20.88" E elev 204 m eye alt 3.11 km

Groundwater Quality

(CGWB)

Location	pH	EC in $\mu\text{S/cm}$ at 25 C	CO	HC	Cl	SO	NO	F	P	Ca	M	Na	K	SiO
			3	O3		4	3		O	4		g		
_____mg/l_____														
Pali	7.08	4608	Nil	163	125	310	219	0.19	nd	31	17	43	21	27
					4					4	0	0		

NAGLA

Block Ballabgarh, District Faridabad,(Cluster-06)



The total area of the pond is 0.63ha and its perimeter is 319m long. A small water body is also located in the western corner of the pond having 0.1 ha area (856m²) and is separated by the ponds embankment. Capacity 10000m³

NAGLA POND

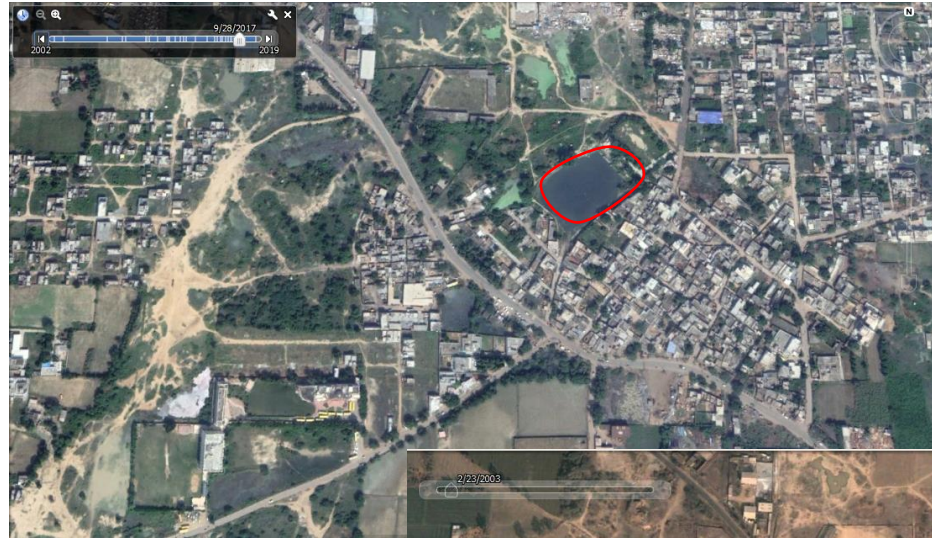
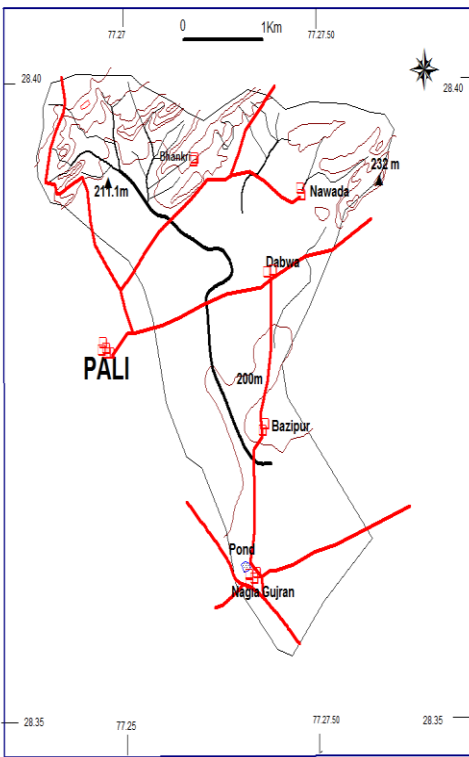
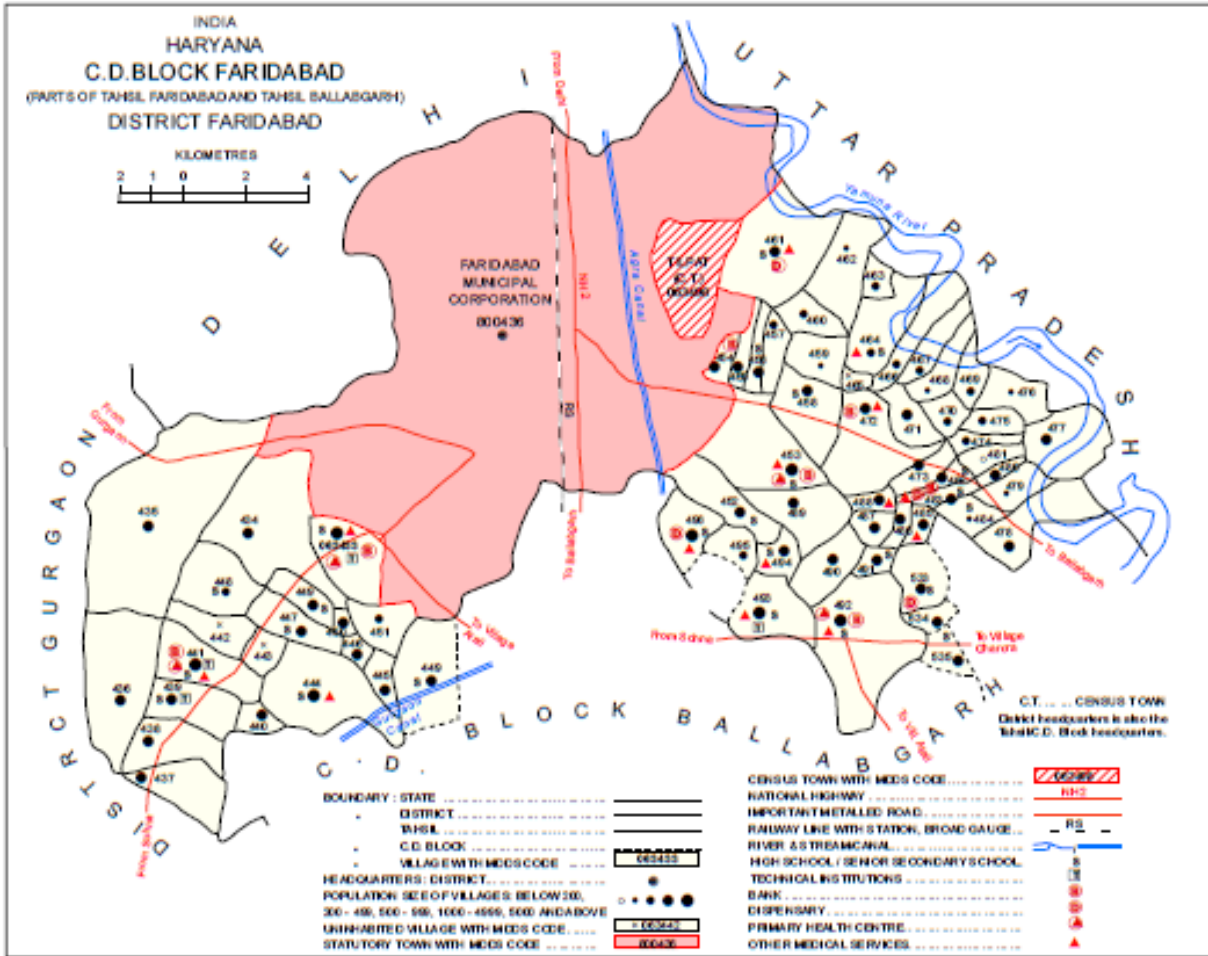


Fig: Google Earth Map of March 2019 (upper) and February 2003 (lower) showing filled and dry pond of village Nagla Gujran respectively.

Groundwater sample from hand pumps / tube wells around the area (within 1-4 km) showing EC in the range of 2338 $\mu\text{S}/\text{cm}$ 16000 $\mu\text{S}/\text{cm}$



THANKS



FARIDABAD

1	77.18867	28.33081	63439	Alampur(32)
2	77.43768	28.42691	63474	Sahrawak(166)
3	77.46764	28.40908	63477	Amipur(172)
4	77.41176	28.39907	63473	Badarpur Said(111)
5	77.36253	28.43187	63455	Badshahpur(140)
6	77.42097	28.43233	63467	Bhaskola(159)
7	77.36835	28.46458	63461	Dadsiya(147)
8	77.19599	28.34065	63448	Selakhari(18)
9	77.23871	28.32597	63444	Fatehpur tagga(29)
10	77.21626	28.37468	63434	Gothra mohbatabad(14)
11	77.42568	28.40102	63482	Jasana(110)
12	77.4111	28.41628	63471	Kanwara(156)
13	77.25389	28.35639	63451	Kheri Gujran(22)
14	77.17956	28.30563	63437	Khori Jamalpur(34)
15	77.39852	28.45971	63462	Kirawali(148)
16	77.16746	28.33327	63436	Kot(16)
17	77.40322	28.45102	63463	Lalpur(149)
18	77.25626	28.32499	63446	Qureshipur(24)
19	77.17493	28.37855	63435	Mangar(15)
20	77.24138	28.35196	63450	Nekpur(23)
21	77.22005	28.36213	63449	Pakhal(21)
22	77.2442	28.37973	63433	Pali(13)
23	77.35661	28.43261	63454	Palwali(138)
24	77.21043	28.36292	63447	Pawta(20)
25	77.42651	28.41683	63475	Phulera(165)
26	77.26765	28.34309	63499	Sarurpur(27)
27	77.43977	28.40456	63480	Sidhola(168)
28	77.19054	28.31471	63438	Sirohi(33)
29	77.40431	28.38966	63488	Tajupur(112)
30	77.20695	28.32533	63443	Alawalpur(30)

