



Government of India  
Ministry of Jal Shakti  
Department of Water Resources,  
River Development & Ganga Rejuvenation

# SUSTAINABILITY OF GROUNDWATER SOURCES

Standard Operating Procedure



# JAL SHAKTI ABHIYAN: CATCH THE RAIN – 2023

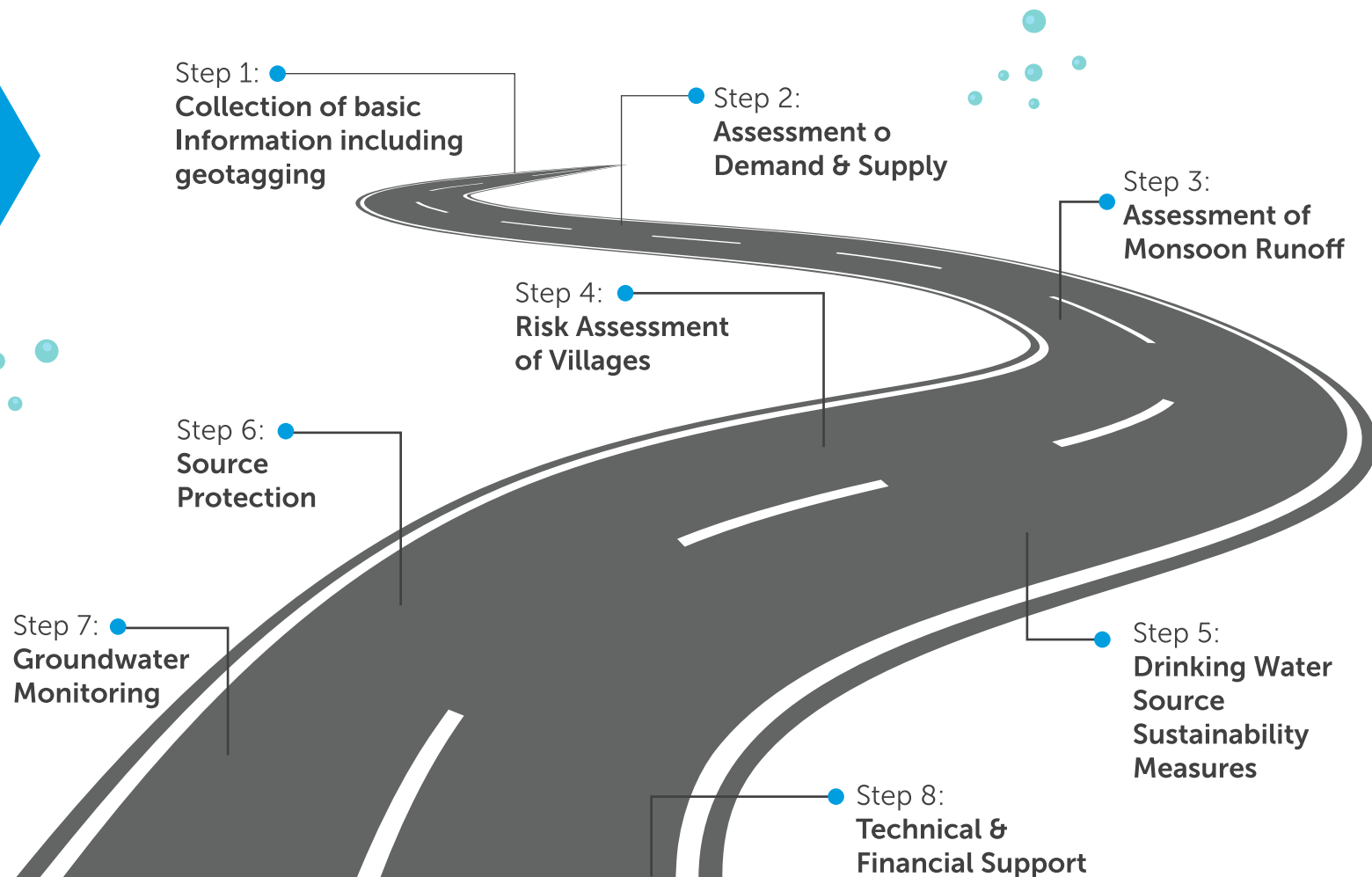
Theme: Source Sustainability for Drinking Water

## BACKGROUND

To improve the 'ease of living' of rural population, Jal Jeevan Mission (JJM) is under implementation in partnership with States to provide a functional household tap connection (FHTC) to every rural household by 2024. JJM aims at providing drinking water of prescribed quality (BIS 10500 water quality standards), in adequate quantity (55 lpcd), on long-term and regular basis. With same aquifer catering to the needs of agriculture and drinking water, it is necessary to sustain drinking water sources and springs so that norms of water supply prescribed by JJM can be ensured over the years.

## SOP ON SUSTAINABILITY OF GROUNDWATER SOURCES

Sustaining groundwater sources need large scale water conservation measures and recharge in the villages where JJM schemes are GW based. To have a scientific approach in various terrain there is a need to have manual on Standard Operating Procedure (SOP) for Ground Water Source Sustainability. The present SOP is a step-by-step guide providing a broad framework to the water supply agencies and field workers which has following steps:



## STEP 1: COLLECTION OF BASIC INFORMATION INCLUDING GEOTAGGING

The first step in the entire process is collection of basic Information including geotagging of JJM drinking water sources. The basic information to be collected are shown in the table below:

**Basic Information (Mobile app used during JSA may be used)**

Village	
Location	District/ Block/ GP Lat Long
Population	
Aquifer Type	Soft Rock/ Hard Rock
Weathered / Soil Thickness (m)	
Structure Type	Dug Well /Tube Well/ Bore Well
Sustainable throughout the year?	Yes/No
Average pumping hours per day	
Water Quality Issue	Saline/ Fluoride / Iron / Nitrate / Arsenic



## STEP 2: ASSESSMENT OF DEMAND AND SUPPLY

Second step in the process is assessment of gap between the demand and supply for drinking water which can be processed by using the table below:

### Demand and Supply Assessment

Demand Assessment			
Population	Per capita water supply (minimum 55 LPCD)	Nos of days	Annual Demand (Cubic metre/Year)
1	2	3	$4 = (1 \times 2 \times 3) / 1000 = (a)$
Supply Assessment			
Scheme	Discharge (Cubic m/hr)	Nos of Running Hours/ day	Annual Extraction (Cubic metre/Year)
1	2	3	$4 = (2 \times 3 \times 365)$
Source 1			$(b) = 4$
Source 2			$(c) = \text{Loss@ 15\% of } (b)$
			Total $(d) = (b) + (c)$
<b>Gap Assessment</b>			<b>(a) – (d)</b>

## STEP 3: ASSESSMENT OF MONSOON RUNOFF

Assessment of rainwater runoff and non-committed runoff is the key to groundwater recharge. Estimation can be done as below:

### Assessment of Monsoon Runoff

Land use	Runoff Co-efficient (Fraction)	Area (Square metre)	Rainfall (m)	Runoff (Cubic metre)
1	2	3	4	$5 = 2 \times 3 \times 4$
Agriculture	0.20			
Habitation	0.50			
Others	0.15			
			Total	

Source: CPWD RWH Manual - 2002

## STEP 4: RISK ASSESSMENT OF VILLAGES

Based on rainfall, aquifer potential, sustainability/ availability of groundwater, terrain, depth to water level and water quality risk assessment of villages can be done and can be categorised as Safe, At risk and High Risk.

SAFE villages are those which do not require any intervention and can support existing groundwater based schemes in long term.

AT RISK villages are those where gap between demand and supply is positive. These villages can only be sustained by undertaking recharge/ conservation interventions.

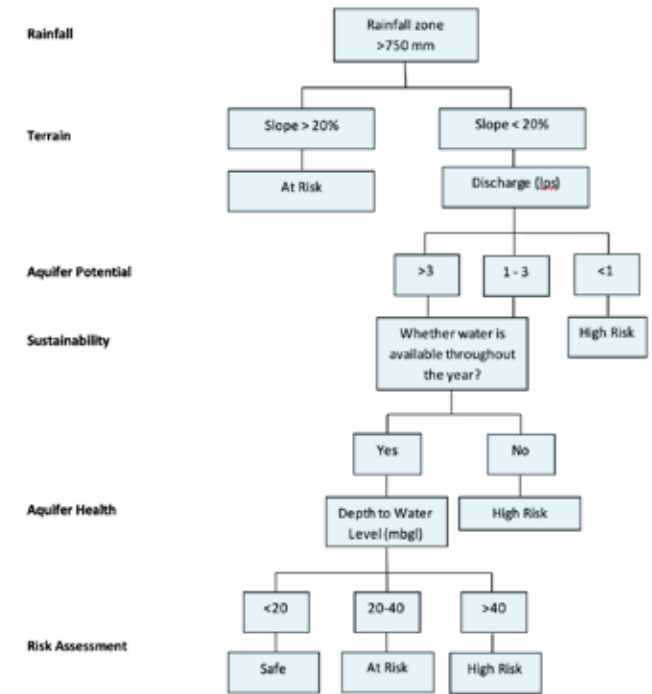
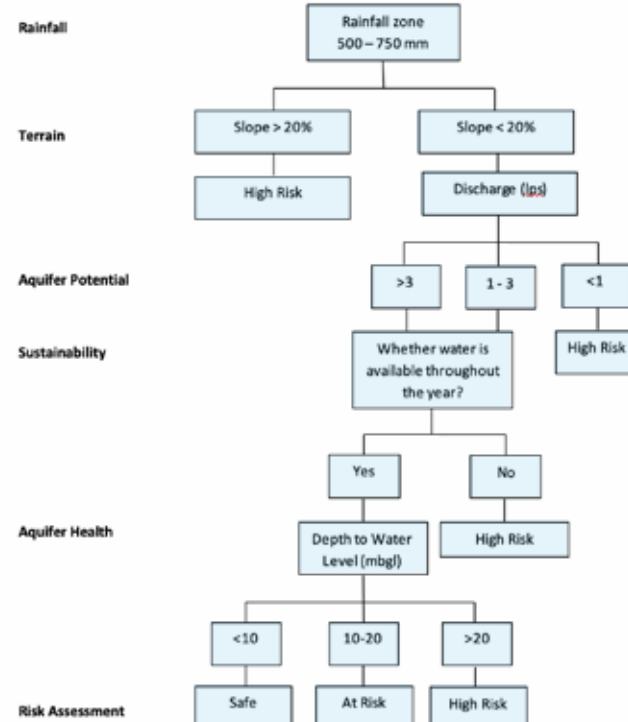
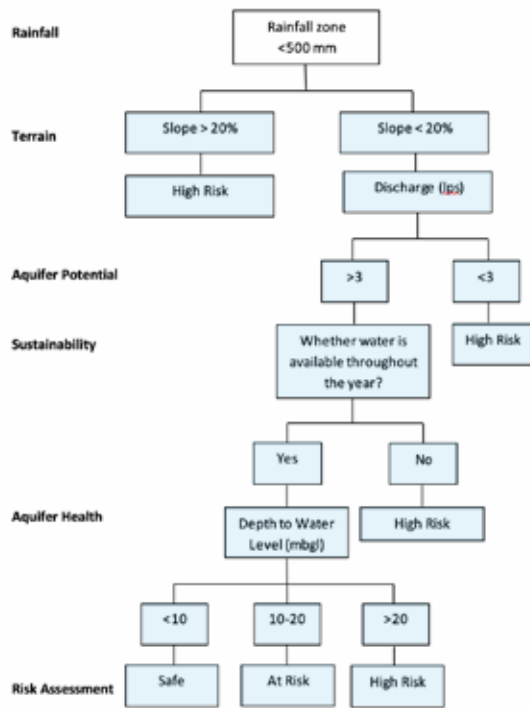
HIGH RISK villages are those where sources cannot be sustained even if various intervention are taken up due to either low potentiality of aquifers or poor rainfall or deep-water level of more than 40 metres below ground level (mbgl).

**Table 4: Risk Assessment of Villages**

Parameter	Safe	At Risk	High Risk
Normal Annual Rainfall (mm)	> 750	<750 but >500	<500
Tube well/ Bore well Discharge (lps)	> 3	1 to 3	< 1
Whether Discharge is available throughout the year	Yes	No	No
Terrain	Plain/Valleys	Plain/Valleys	Hills/ High Slopes
Depth to Water Level (m bgl)	<10	10 - 20	> 40
Quality			
Iron (ppm)	< 1	> 1	> 1
Fluoride (ppm)	< 1.5	> 1.5	> 1.5
Arsenic (ppb)	< 10	> 10	> 10
Salinity (TDS)	< 500	500- 2000	>2000



# THE RISK ASSESSMENT OF VILLAGES FOR 3 DIFFERENT RAINFALL ZONES HAVE BEEN PREPARED FOR EASY UNDERSTANDING:



## STEP 5: DRINKING WATER SOURCE SUSTAINABILITY MEASURES

In order to improve source sustainability, interventions are to be designed on the basis of:

### **Runoff water available for recharge**

#### **Local aquifer characteristics and yield potential.**

- Aquifer yields more than or equal to 2 litre per second – Go for Recharge.
- Aquifer yields Less than 2 litre per second - water conservation structures (WCS).
- Occurrence of clay layer at shallow depth (<5m) - Percolation Tank (PT) with Recharge shaft (RS) otherwise percolation tank may be constructed.

#### **Local topography and slope, thickness of clay layer etc.**

- If nearby streams exist in the upstream side of JJM structures - check dam/ gabion/ nala bunding can be constructed.
- Sloping terrain contour trench and contour bund.

#### **Post Monsoon Depth to Water Level**

- Less than 5 m - (WCS)
- More than 5 - construct groundwater recharge structures.

Flow Chart Depicting Step by Step Process of finding solution to Source Sustainability is presented in annexure-I.





### **Groundwater Recharge Interventions for Source Sustainability**

The number and type of the structures to be constructed depend upon factors like the aquifer disposition, aquifer property, groundwater levels, soil type, depth of weathering in hard rock regions, availability of non-committed surplus runoff, slope, land use, ground water quality etc.

Details of designs of different types of artificial recharge structures are given in the manual on artificial recharge of ground water published by CGWB (<http://cgwb.gov.in/documents/Manual-Artificial-Recharge.pdf>). Information on aquifer dispositions, aquifer properties, ground water quality, ground water level are required for designing. Aquifer disposition and aquifer properties are available in the district specific reports of NAQUIM studies, which can be accessed through the website of CGWB. Some of the most suitable groundwater recharge interventions in rural areas are given below





<b>Check Dam</b>	
<b>Gabbion Structures/Gully Plug /Nalah Bunds</b>	
<b>Percolation Ponds</b>	
<b>Contour Bunds and Contour Trenches</b>	

### Spring Rejuvenation Interventions

Villages located in Indian Himalayan Region (IHR) are heavily dependent on springs to meet their drinking water demand. Sustainability issues of springs rising alarmingly. To make the springs sustainable spring management is required. Basic Information on springs like discharge, nature of springs (perennial/ non-perennial), dependency on springs and their vulnerability is needed to be collected. Spring rejuvenation measures like digging ponds, trenches and reviving water bodies are needed to be taken up in possible locations. Sustainability measures of springs can be referred from Dhara Vikas Handbook (A user manual for Springshed Development to Revive Himalayan Springs) prepared by Government of Sikkim, which can be accessed through <http://scstsenvis.nic.in/index2.aspx?slid=2092&sublinkid=895&langid=1&mid=2>.

Apart from this, International Centre for Integrated Mountain Development (ICIMOD) has prepared a Protocol for reviving Springs in the Hindu Kush Himalayas: A Practitioner's Manual which can be accessed through <https://lib.icimod.org/record/34040>.

### Precaution to be taken for maintenance

- Recharge structures should be fitted with properly designed filter media to avoid contamination of aquifer.
- Maintenance/ rejuvenation of existing structures like desilting water bodies, clearing the inlet channels of encroachments/ jungle clearance, strengthening of bunds, repairs to regulatory control assets, etc may be taken up.
- Protective fencing around the pumping well and plantation of shrubs and small trees in the 50 m radius.
- Protect immediate upstream / catchment area of a spring, if natural forest is available it should not be disturbed.
- No masonry/ concrete structure within 50 m upstream of spring should be allowed.

### Other Measures

- District authorities should ensure regular risk assessment of villages.
- To stop wastage of precious groundwater sources, filling up of farm ponds/ tanks by pumping groundwater should be discouraged.
- Water bodies should be kept clean and dumping of garbage in water bodies should be banned.

## STEP 6: SOURCE PROTECTION

The human activities in the catchment area of the scheme can interact with underlying aquifer system and affect the availability and quality of the water. The contaminated water can seep through the annular space around the wells and leachates from dumping of garbage can also contaminate underlying aquifers. Following safeguards may be taken up **within 50 m radius of tube well / bore well.**

- No Land fill site
- No disposal of toxic /polluting substance
- No direct infiltration of wastewater/ grey water
- No soak pit/ magic pit
- Avoid sinking of additional tube well / bore well within 200m radius of existing Groundwater scheme.

## STEP 7: GROUND WATER MONITORING

Monitoring of the Water level and water quality in and around the scheme is very important to know the health of the GW system for maintaining its future sustainability. Following mechanism is suggested to adopt by water supply agencies:

- Monthly monitoring of water level from at least one tube well
- Pre and Post monsoon Water quality monitoring for chemical and biological parameters.
- Maintain daily Pumping Hours record.
- Monitoring of extraction in 500m radius of the pumping well-constructed under JJM.
- Monitor tube well/ bore well extracting groundwater within 500m radius of existing JJM source.



## STEP 8: TECHNICAL SUPPORT

To support the above mission involvement of various stakeholders from Governments, NGOs/ Civil Societies/ Colleges with Geology Departments/ Engineering colleges/ Retired Officers from Groundwater Department/ Geology Department/ PHED/ DWS may be ensured. SAKSHAM and JALDOOT may be referred to resolve technical issues. Hands on training sessions of short duration (3-5 day) may be arranged for members of Pani Samiti/ VWSC/ DWSC etc. List of NGO's working in water sector and WASH partners in enclosed in annexure-II for quick reference.

## FINANCIAL SUPPORT

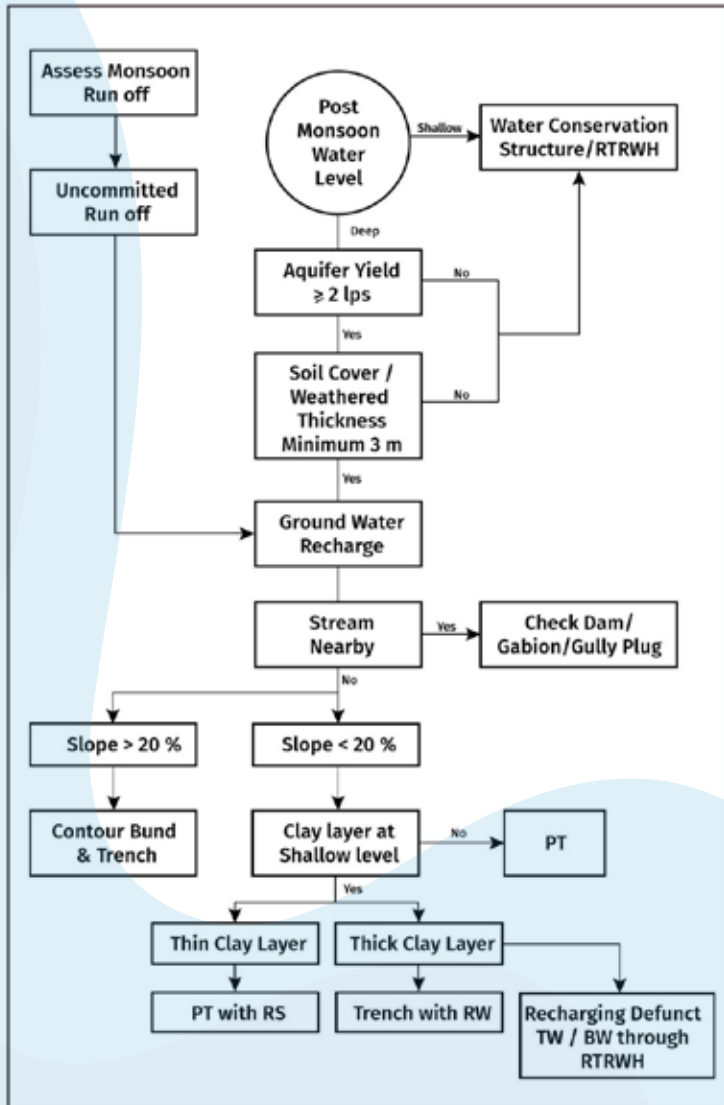
Construction of structure for storage or recharging groundwater would involve lots of investment. The water conservation and recharge interventions are also being taken up under various Government of India and State Government schemes. These works can be prioritised and dove-tailed with the exiting schemes to improve the sustainability of these villages. Some of the schemes are mentioned below:

Sl. No.	Name of the Scheme	Central/ State Government Department	Components that can be converged
1.	Swachh Bharat Mission - Grameen (SBM-G)	Department of Drinking Water and Sanitation, M/o Jal Shakti	Greywater management – soak pits (individual/ community), waste stabilization ponds, etc.
2.	MGNREGS	M/o Rural Development	All water conservation activities under Natural Resource Management (NRM) component
Sl. No.	Name of the Scheme	Central/ State Government Department	Components that can be converged
3.	Watershed Development Component (WDC) of PMKSY	D/o Land Resources	Watershed management/ RWH/ artificial recharge, creation/ augmentation of water bodies, etc.
4.	Atal Bhujal Yojana (in select States)	DoWR, Ministry of Jal Shakti	Ground water conservation work from Incentive Component
5.	State Ground Water Authorities	Concerned State departments	Ground water conservation work from water abstraction charges, penalties and environmental compensation.
6.	Repair, Renovation and Restoration of water bodies	D/o Water Resources, River Development & Ganga Rejuvenation	Restoration of larger water bodies
7.	Rashtriya Krishi Vikas Yojana (RKVY)	M/o Agriculture, Cooperation and Farmers Welfare	Watershed related works
8.	Pradhan Mantri Kaushal Vikas Kendra (PMKVK)	M/o Skill Development and Entrepreneurship	Skill development, training, etc. for human resources required for rural water supply schemes
9.	Aspirational districts programme	NITI Aayog	Water conservation activities taken up under discretionary funds with District Collector
10.	District Mineral Development Fund (DMDF)	State	Water conservation activities on large scale
11.	National Rural Livelihoods Mission/ State Rural Livelihoods Mission	M/o Rural Development	Developing women entrepreneurs and SHG led enterprises for water supply services



# ANNEXTURE-I

## SOURCE FINDING - STEP BY STEP PROCESS FOR SUSTAINABILITY



RTRWH = Roof Top Rain Water Harvesting  
 PT = Percolation Tank  
 TW / BW = Tube Well / Bore Well  
 RS = Recharge Shaft  
 RW = Recharge Well

## ANNEXTURE-II

### LIST OF NGOS WORKING IN WATER SECTOR

S.No.	Name of the NGO	Communication Address	Organization Head	Phone Number	Alternate Number	E-Mail Id
<b>Lead Agency</b>						
1.	Society for Development Alternatives (DA)	B-32, TARA Crescent, Qutub Institutional Area, New Delhi 110016	Gp. Capt. Deepak Verma (Retd.)	01126544100	09871990909	library@devalt.org. ckmishra1@devalt.org. kvijayalakshmi@devalt.org.
2.	Vyakti Vikas Kendra, India	No. 19, 39 <sup>th</sup> A Cross, 11 <sup>th</sup> Main Rd,5, T Block, Pattabhirama Nagar, Jayanagar, Bengaluru, Karnataka – 560041	CMDE Sarvotham Rao	9341810350 /9243060609		chairman@vwki.net
3.	WWF India	Pirojsha Godrej Building, 172 B, Lodhi Road, Lodhi Estate, New Delhi – 110003	Ms. Sejal Worah			sworah@wwfinida.net
4.	Peoples Science Institue	ITBP Rd, P.O. Near Sun Park Inn Hotel, Kanwali, Dehradun Uttarakhand – 248001	Debashish Sen	01352763649	7830133255	psiddoon@gmail.com
5.	Action for Food Production (AFPRO)	25A/1, D Block, Pankha Road, Janakpuri Institutional Area, Sagar Pur, New Delhi, - 110058	D K Manavalan	01128522575 /01128525452		ed@afpro.org.
6.	Social Action for Rural Development	ChhotkiMurrām Ramgarh Cantonment, Jharkhand – 829122	Mr Naresh Prasad Singh	9431146893 /9431146129		sardagroup01@gmail.com
7.	Advanced Center for Water Resources Development and Management	Suvidya, 27 Lane no. 03, Kshipra Society, Karve Nagar Pune 411052, Maharashtra	Dr. Himanshu Kulkarni	9822549156 /9822529208		acwadam@vsnl.net
8.	Watershed Organization Trust (WOTR)	2 <sup>nd</sup> Floor, The Forum, Padmavati Corner, Pune – Satara Road Pune – 411009, Maharashtra	Mr. Prakash Keskar	02402450188	9423791528	projects@wotr.org

9.	Ambuja Cement Foundation	Elegant Business Park, MIDC Cross Road B, Off Andheri Kurla, Road Andheri (E), Mumbai, - 400059 Maharashtra	Ms. Anagha Mahajani	9920290051		anaghamahajani.ext@ambujacement.com
10	BAIF Development Research Foundation	BAIF Bhavan, Dr Manibhai Desai Nagar, Warje, Pune 411058, Maharashtra	Mr. Girish G Sohani	2025231661	9422306338	ggsohan@baif.org.in
11	Ramky Foundation	Ramky Towers Complex, Gachibowli, Hyderabad, Telangana 500032	Mr. M.V. Rami Reddy	04023015000	9866777870	muvvaramu@gmail.com
12	Saci Waters	B-87, 3 <sup>rd</sup> Avenue, Sainikpuri, Neredmet Police Station Secundrabad, Telangana – 500094	Dr. Snehalatha Mekala	04027117728	9618844459	snehalatha@saciwaters.org infor@saciswater.org
13	Centre for Socio-economic and Environmental Studies (CSES)	Khadi Federation Building, NH By-pass, Service Rd, Palarivattom, Ernakulam Kerala – 682024	Dr. N Ajith Kumar	04842805107	9446395108	ajithcses@gmail.com
<b>Field Agency</b>						
14	Society for Technology and Action for Rural Advancement (TARA)	B-32, TARA Crescent, Qutub Institutional Area, New Delhi 110016	Gp. Capt. Deepak Verma (Retd)	1126544100	09871990909	dverma@devalt.org
15	Institute for Integrated Rural Development	IIRD Complex, Bye Pass Road, Shanan, Sanjauli, Shimla, 171006, Himachal Pradesh	Joy Daniel	9623067272	02402379336	jdaniel@iird.org.in
16	Action Aid Association	Head Office (Country Office) R7, Hauz Khas Enclave, New Delhi, Delhi 110016	Prem Ranjan	01140640559	7891068831	prem.ranjan@actionaid.org
17	Humana People to People India	111/9-Z, Aruna Asaf Ali Marg, Kishangarh Village, Vasant Kunj, New Delhi, Delhi 110017	Kailash Khandelwal	9560434695	01147462222	khandelwal@humana-india.org
18	Indian Society of Agribusiness Professionals	B1/B, Mathura Rd, Mohan Cooperative Industrial Estate, Greater Kailash, New Delhi, Delhi 110044	Vijay Kumar Sahai	01143154100	8377904952	vijaysaha@isapindia.org
19	Indian National Trust for Art and Cultural Heritage (INTACH)	71, Lodi Estate, New Delhi - 110003	Manu Bhatnagar	9810036461	1124641304	pndhdintach@gmail.com

20	Aqua Foundation	707, Eros Apartments, 56- Nehru Palace, New Delhi - 110019	Praggya Sharma	9818568825	01141318030	praggya@aquafoundation.in
21	Yuva Mitra	Mitranagan Campus, Ghoti – Sinnar Highway, Harsuleshivar Lonarwadi, Taluka – Sinnar, Nashik District Maharashtra - 422103	Mr. Sunil Pote	9422942799	9527402400	sunil.pote@gmail.com
22	Advit Foundation	B 205, Tower B, Pioneer Urban Square, Sector-62, Gurugram, 122008, Haryana	Chandramouli Chandrasekaran	9971100511	9810743436	mouli@advit.org
23	Shramik Bharti	392, Lakhanpur, Khyora, Kanpur Nagar – 208024 Uttar Pradesh	Rakesh Kumar Pandey	9935535680	70079644370	rakesh@shramikbharti.org.in
24	Association for Rural and Technical Education Centre (ARTEC)	Village Mahendru, P.O> Katora, Tehsil Dehra, Kangra District Himachal Pradesh - 176027	Rakesh Kumar Bains	9814007704	9914055533	artecrakesh@gmail.com
25	Gramya Vikash Mancha	Village Kardaitola P.O. Barbari (Kalag), Nalbari Assam – 781351	Prithi Bhusan Deka	03624-283888	09854018846	dekapb.deka@gmail.com
26	North East Affected Area Development Society	PO Dhekiakhwa, Bor Namghar Path, Dagar Chowk, Distt. Jorhat Assam - 785700	Girin Chetia	9954451278	9957852794	neads-jorhat@yahoo.co.in
27	Life Academy of Vocational Studies	17 AV Complex, Gadakana, P.O. Mancheswar Railway colony Bhubaneswar 751017, Odisha	Akshaya Mohapatra	9437960808	06742117475	lavsorissa@rediffmail.com
28	Tagore Society for Rural Development	46 B, Arabinda Sarani, Kolkata – 700005, West Bengal	Dr. Dipankar Roy	03325554391	9830972136	tagoresociety2@gmail.com
29	Society for Upliftment of People with Peoples Organization and Rural Technology	DVC Colony Hazaribagh – 825301, Jharkhand	Bhawani Shankar Gupta	9431185632	9931150749	bsguptahzb@rediffmail.com
30	Women’s Organization for Socio-Cultural Awareness (WOSCA)	AT/PO, Mandua Keonjhar – 758014, Odisha	Dharitri Rout	9437025119	06766-253490	wosca@rediffmail.com
31	Vikas Sahyog Kendra	Paner Bandh Road, Near Viviekanand Chowk, Chainpur, Shathpur, Jharkhand 82210	Manoj Kumar Singh	9431715087	7759049473	vskmanoj@yahoo.co.in

32	LOKADRUSTI	Village Gadramunda, P.O. Chindaguda, Vill-Khariar, distt. Nuapada Odisha – 766107	Abanmohan Panigrahi	9437071812	9556061812	lokadrustikhariar1@rediffmail.com
33	Jan Mitram Kalyan Samiti	Jan Mitram House (Administrative Centre), Past kelo Vihar, near Indian School, Chhattisgarh - 496001	Manish Singh	7024142301	9826144243	Janmitram@gmial.com
34	Janajagaran Kendra	Near PTC Road, Canary Hill Road, Hazaribagh, Jharkhand 825301	Ratikanta Nayak	06762223014	9437352881	janjagarankendra@yahoo.co.in
35	ADHIKAR	Plot 77/180/970, Subudhipur, Tomando, Bhubaneswar – 752054 Khordha Odisha	Jatin Kumar Patra	9937051837	8895255337	adhikar-adhikar@rediffmail.com
36	Centre for Advanced Research & Development	H-2/195 Arvind Vihar, Bagmugaliya, Bhopal Madhya Pradesh - 462043	Prakash Bannapure	9425015323	07552481234	card-vivek@yahoo.com
37	Foundation for Ecological Security (FES)	C/O Surabhi Regency, Jay Tower, Amul Dairy Road, Anand – 388001, Gujarat	Jagdeesh Rao	02692261303	02692261402	ed@fes.org.in
38	Krishak Sewa Sansthan	Ganesh Colony Godhara Sadan, Parbatsar, dist. – Nagour, Rajasthan – 341512	Kamlesh Kumar Jangid	9799352233	9694788161	26jangid@gmail.com
39	Development Support Centre	Maruti Nandan Villa 1, Near Government Tubewell, Bopal Ahmedabad, Gujarat 380058	Mr. Monan Sharma	02717235994	02717235995	dsc@dscindia.org
40	Dilasa Janvikas Pratishthan	B-3, Sudarshan Park, Vedant Nagar, Near MIDC Regional Office Station Road, Aurangabad, Maharashtra – 431005	Ms. Varshalee Khadilkar	02402320444	9822068923	dilasanga@gmail.co,
41	Rashtravikas Agro Education Sanstha, Amainer	10, “Ramkunj” Shiv Parvati Colony, Near Surabhi Colony, Amalner Maharashtra - 425401	Bhupendra R Mahale	9422618407	7774055587	raesamalner@gmail.com
42	Action for Agricultural Renewal in Maharashtra	Raisoni Park, Market Yard, No.2,23 A-B, Market yard, Pune Maharashtra - 411037	Mr. Subhash M. Tamboli	9822752054	02024264641	executivedirector@afarm.org
43	Harshal Gramin Vikas Bahuddeshya Sastha Chandrapur	M.S Watchal Bhawan, Ground Floor, Mul Rd, Vivek Nagar, Chandrapur, Maharashtra - 442402	Dr. Sandeep Pipare	07172272427	9422135329	hrda_chd1@rediffmail.com



44	Iclei South Asia	C-3, Lower Ground Floor, Green Park Extension, New Delhi, Delhi - 110016	Emani Kumar	9810544035	9810328071	Emani.kumar@iclei.org
45	Bhopal Yuwa Paryavaran Shikshan and Samajik Sanstha	83, Paraspar Colony (near Ram Mandir) Chunabhatti, Raja Bhojmarg, Bhopal, Madhya Pradesh - 462016	Akhilesh Singh Yadav	9425393744	9752107675	bypassindia@gmail.com
46	Ashwamegh Gramin Panlot Kshetra Vikas Va Shaikshanik Sanstha (AGVSS)	P.O Fattepur (Shivanagaon) Tehsil Teosa, Amravati, Maharashtra -444902	Yashwant V. Pande	9422121922	9665232319	mr.yashpande@rediffmail.com
47	Shikshit Rojgar Kendra Prabandhak Samiti	1/129, Housing Board, Jhunjhunu Rajasthan 333001	Rajan Choudhary	9414080218	01592234664	srkpsjnn@gmail.com
48	Coodu Trust	83, R.M. Colony, Dindigul, Tamilnadu - 624001	S Jagadeesan	9842127886	9443061123	director.coodustrust@gmail.com
49	Arshabharath Bhahujana Bodhavalkarana Grama Vikasana Samithi	Nathamkuni P.O. Meppadi, Wayanad, Kerala, India - 673577	A K Sara	9747008500	9447082700	arshabharathmail@gmail.com
50	Solidarity Movement of India	Idukki, Kanjikuzhy, Idukki -685606, Kerala				solidarindia@yahoo.com
51	Centre For Alternate Rural Employment	19/31, First Cross, Thillapuram, Namakkal – 637001, Tamil Nadu	R. Yashotha	9003678550	9500915533	caretrusst04@yahoo.com
52	SAMUHA	Vittalapura Road, Kanakagiri, Gangavath Taluk Koppal District, Karnataka – 583283	Narayanaswamy M	9448385412	8533240576	ns@samuha.org
53	EFFORT	9-240, G.T Road, Martur – 523301, Prakasam District, Andhra Pradesh	Jasti Venkata Mohan Rao	9959900081	08404271737	effortap@gmail.com
54	Society for National Integration Through Rural Development	Railpet, P.O. Box.24, Ongole – 523001, Prakasam district, Andhra Pradesh	Godfrey G P Jawahar	9030071957	9849212816	snirdruraldevelopment@gmail.com
55	Kottayam Social Service Society	Chaithanya Pastoral Centre, Theilakom P.O. Kottayam, Kerala - 686630	Fr. Bins Chethalil	9446984438	04812790950	ksss@Ksss.in
56	Navajeevan Organization	24/36 Ambedkar Nagar, Venkatagiri - 524132, Nellore district, Andhra Pradesh	K Sahadevaiah	9440430718	9908360815	kalavapalli.sahadevaiah@gmail.com
57	Support For Network and Extension Help Agency (SNEHA)	No.38/A-1, Vishweshwara Nagar 2 <sup>nd</sup> stage, Industrial Suburb, Near Maharshi Public School, Mysore – 570008, Karnataka	H Hemavathamma	9448031977	08212562471	snehaorganisation@gmail.com
58	Green India Trust (GIT)	16-2-51, Near S2 Cine Complex, Pogathota, Nellore – 524001 Andhra Pradesh	Dr. Ch. Murali Krishna	9491067979	08612334289	chairman@giturst.org

Sl. No.	State / UTs	Proposed Lead Partner
1	Andaman & Nicobar Islands	AIILSG
2	Andhra Pradesh	TATA TRUST
3	Arunachal Pradesh	AIILSG
4	Assam	INREM FOUNDATION
5	Bihar	AGA KHAN FOUNDATION
6	Chattishgarh	WATER AID
7	Dadra & Nagar Haveli and Daman & Diu	AIILSG
8	Goa	CEE
9	Gujarat	CEE
10	Haryana	WASH 1
11	Himachal Pradesh	WASH 1
12	Jammu & Kashmir	PIRAMAL FOUNDATION
13	Jharkhand	PIRAMAL FOUNDATION
14	Karnataka	AIILSG
15	Kerala	WASH 1
16	Ladakh	TATA TRUST
17	Lakshadweep	AIISG
18	Madhya Pradesh	WATER AID
19	Maharashtra	PIRAMAL FOUNDATION
20	Manipur	WASH 1
21	Meghalaya	AIILSG
22	Mizoram	TATA TRUST
23	Nagaland	TATA TRUST
24	Odisha	CEE
25	Puducherry	AIILSG
26	Punjab	WASH 1
27	Rajasthan	INREM
28	Sikkim	WASH 1
29	Tamil Nadu	UNICEF
30	Telangana	AGA KHAN FOUNDATION
31	Tripura	TATA TRUST
32	Uttar Pradesh	AGA KHAN FOUNDATION
33	Uttarakhand	TATA TRUST
34	West Bengal	UNICEF

# BEST PRACTICES ON SOURCE SUSTAINABILITY

## AQUIFER REJUVENATION - A CASE STUDY FROM NAGIREDDIPALLI WATERSHED, JANGAON ASPIRATIONAL DISTRICT, TELANGANA STATE.

### Issue

The weathered portion was totally desaturated since it has been extensively developed by dug wells, which resulted in shift in dependence for irrigation from dug wells to bore wells to the depth range of 70-100 m.

### Aquifer Rejuvenation Project

Central Ground Water Board had taken up artificial recharge studies in Jangaon aspirational district in Telangana State. The objective of the study was harvesting runoff water for augmentation of groundwater. Details of the project is provided below:

Year of Initiation	2018
Year of Completion	2019
Cost of Project (₹)	1.75 Crores
Rainfall	869 mm
Basin	Part of Krishna basin
Aquifer Type	Hard rock
Fracture Availability	Between 40 and 100m
Discharge (LPS)	2 to 5
Long term Water Level Trend	Decline @ 0.82 m per year
Recharge Interventions	Construction 6 Check Dams, 1 subsurface barrier, 31 Recharge Shafts (RS)
Monitoring Mechanism	Construction of 9 piezometers

### Impact Assessment

The depth to water levels were observed during Nov'2019 to Feb'2021. An average water level rise of 1.9 m has been noticed in these piezometers. The recharge computations based on piezometer well data indicates that Artificial Recharge measures implemented resulted in augmenting the ground water resources by a magnitude of about 4.0 MCM during 2019.

Comparison to pre-project period indicates that the estimated recharge has been enhanced to about 2.5 times higher than rainfall recharge over the watershed in the first two years. The agricultural growth over the watershed has been improved by 13%.

**BEFORE**



**AFTER**

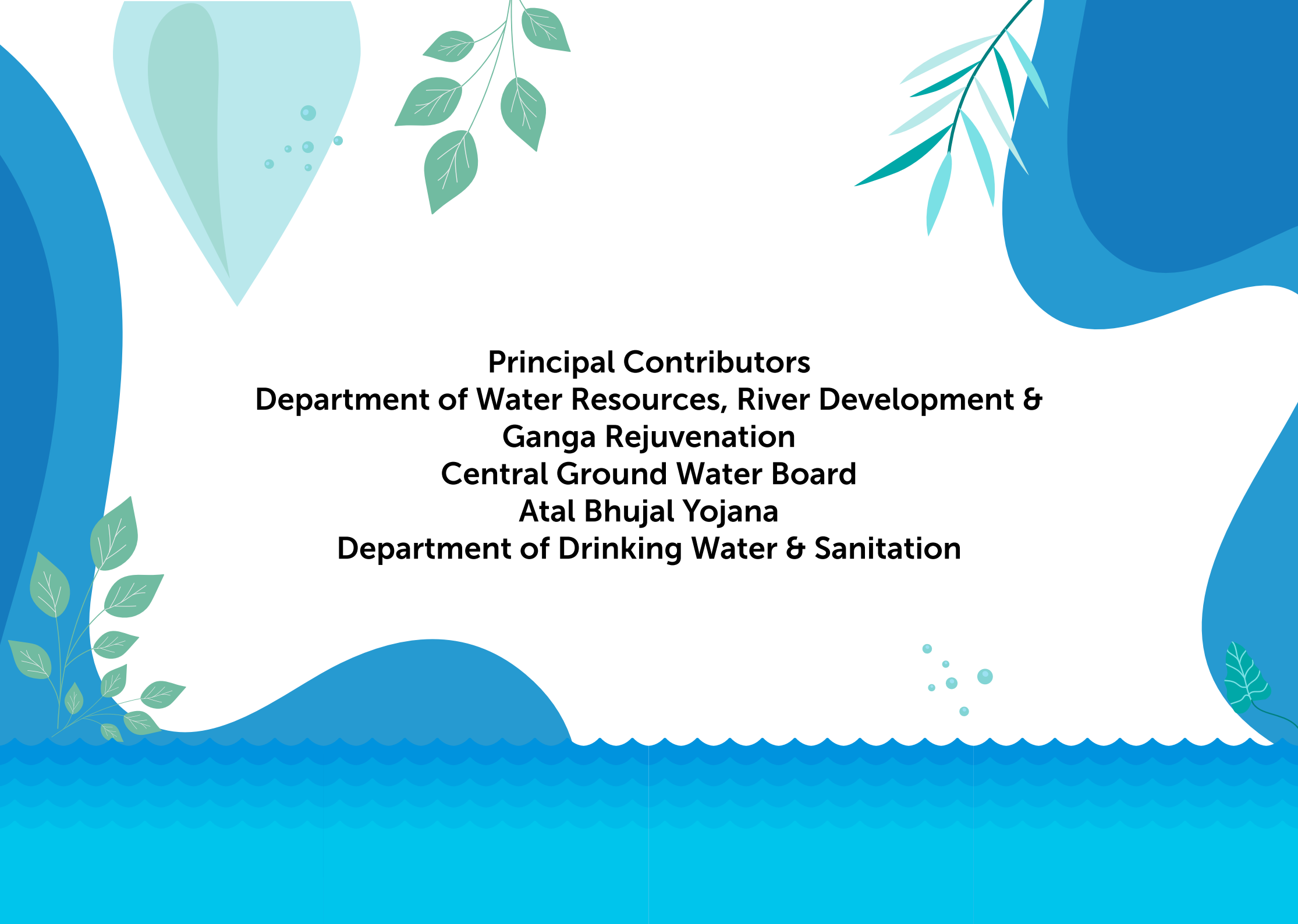


**BEFORE**



**AFTER**





**Principal Contributors**  
**Department of Water Resources, River Development &**  
**Ganga Rejuvenation**  
**Central Ground Water Board**  
**Atal Bhujal Yojana**  
**Department of Drinking Water & Sanitation**



Government of India  
Ministry of Jal Shakti  
Department of Water Resources,  
River Development & Ganga Rejuvenation