PARTICIPATORY GROUNDWATER MANAGEMENT

A collective effort towards addressing India's water security

Participatory Groundwater Management:
A collective effort towards addressing India's water security

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Arghyam
Safe, sustainable water for all

Acknowledgement

This document is derived from the collective experiences of the core Participatory Groundwater Management (PGWM) Resource Centres and is a reflection of the work of many organizations on the ground across India. We acknowledge the extensive work and commitment of Advanced Center for Water Resources Development and Management (ACWADAM), People's Science Institute (PSI), Arid Communities and Technologies (ACT), Watershed Support Services and Activities Network (WASSAN) and Megh Pyne Abhiyan (MPA) towards furthering and championing Participatory Groundwater Management in India and for showing a realistic way to address India's water security.

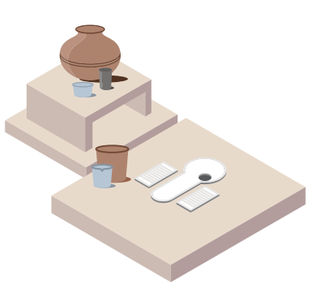
Participatory Groundwater Management is supported by Arghyam.

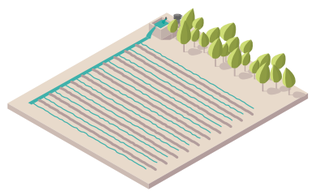
GROUNDWATER

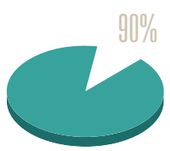
An endangered resource in India

India's groundwater consumption has grown from 20 km³/year in 1940 to 260 km³/year in 2010, sharply rising after 1970 and globally the highest today

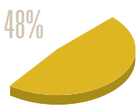
Kamaguna village in Kutch district in Gujarat



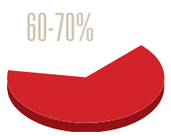




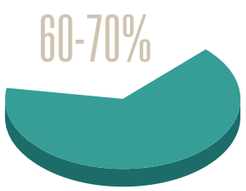
90% domestic rural water is sourced from groundwater



48% of total urban domestic water is derived from groundwater resources



60-70% share of current irrigation comes from groundwater



60-70% districts are vulnerable to exploitation and/or contamination

India is the largest user of groundwater in the world. A study done in 2010 estimates India's usage as nearly one-fourth of groundwater consumption globally[1]. Groundwater meets 60% of nation's irrigation demand, almost 90% of domestic rural demand and around 50% of domestic urban demand. An indiscriminate use of groundwater to meet these demands is impacting an increasing number of aquifers (underground layers of water-bearing permeable rock that hold and transmit groundwater). A 2004 nationwide assessment shows 28% of groundwater blocks, as compared to 7% in 1995 to be in semi-critical, critical, or overexploited categories[2]. 10 years hence, today the situation is likely to be far worse. We are hurtling towards a crisis. Dried up rivers, falling water tables, drinking water and food security are some of the severe problems facing us already. If the current trends continue, some estimates suggest that within 20 years 60% aquifers in India will be in a critical condition[3]. To tackle this situation, it is important to understand how groundwater development is achieved in the country and why there is a need for a paradigm shift in this philosophy.

In the early 1970s, right after the Green Revolution, drilling technology was introduced and widely adopted in India owing to government subsidies and easy availability of inexpensive pumps and drilling technologies. With small investments, farmers could dig tube/borewells in their backyard and provide flexible, on-demand irrigation to support the growing need of providing food and ensuring food security for the rural and urban populations. This, alongwith widespread drilling for domestic purposes have resulted in close to 30 million wells, tubewells and borewells in India today.[4]

As a result, groundwater development which was critical to food security and was conceived as a solution has now become a problem. Over-extraction of groundwater in the last two decades has threatened drinking water security of at least 60% districts[5] in the country. This single statistic necessitates moving from 'groundwater development' to 'groundwater management' in India.

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1 (2010), World Bank, 'Deep Wells and Prudence: Towards Pragmatic Action for Addressing Groundwater Overexploitation in India'

2 (2007), Planning Commission, 'Groundwater Management and Ownership: Report on the Expert Group, GOI. Depending on the extent of groundwater development, the Central Groundwater Board categorizes zones in the country as either safe (less than 70% developed), semi-critical (70-90% developed), critical (90-100% developed) or overexploited (more than 100%).

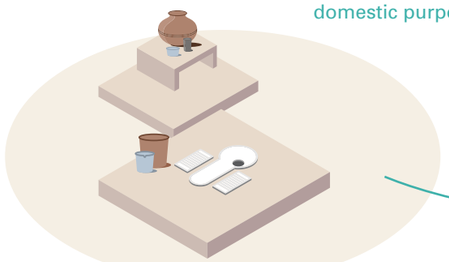
3 Same as (1)

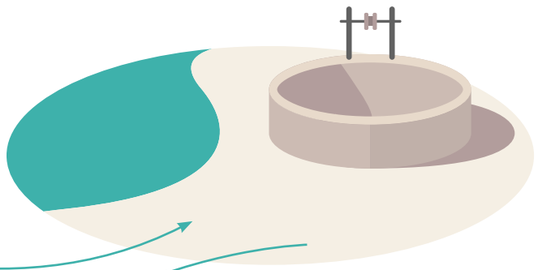
4 (2015) Kulkarni et al, Shaping the contours of groundwater governance in India, Journal of Hydrology : Regional Studies

5 (2005) World Bank, 'India's Water Economy, Bracing for a Turbulent Future'

Trajectory of groundwater usage in India

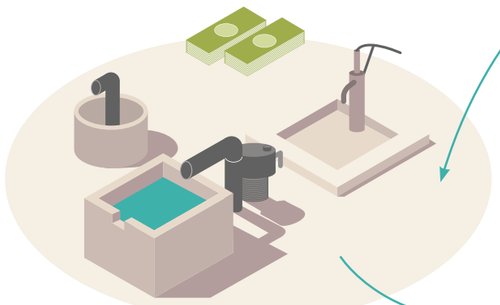
Groundwater usage in early times was limited to drinking and domestic purposes



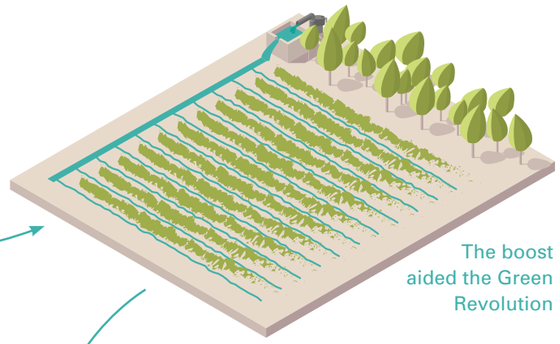


Initially the sources of groundwater were limited yet the demand for groundwater was commensurate with the availability of water

Government subsidies

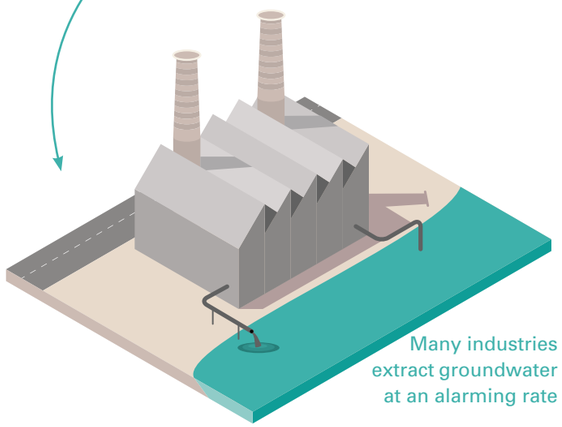


Excess amount of extraction

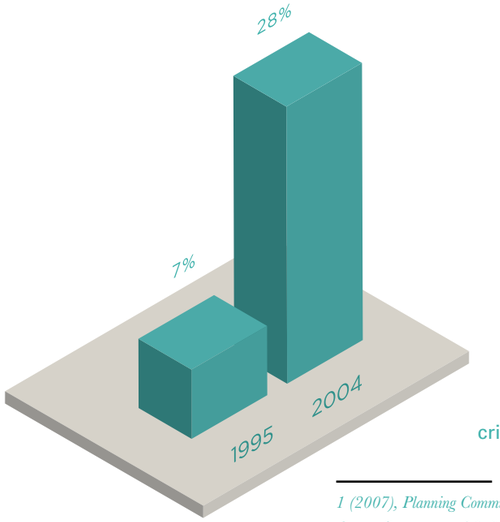


New drilling technologies were introduced to boost irrigation

The boost aided the Green Revolution



Many industries extract groundwater at an alarming rate



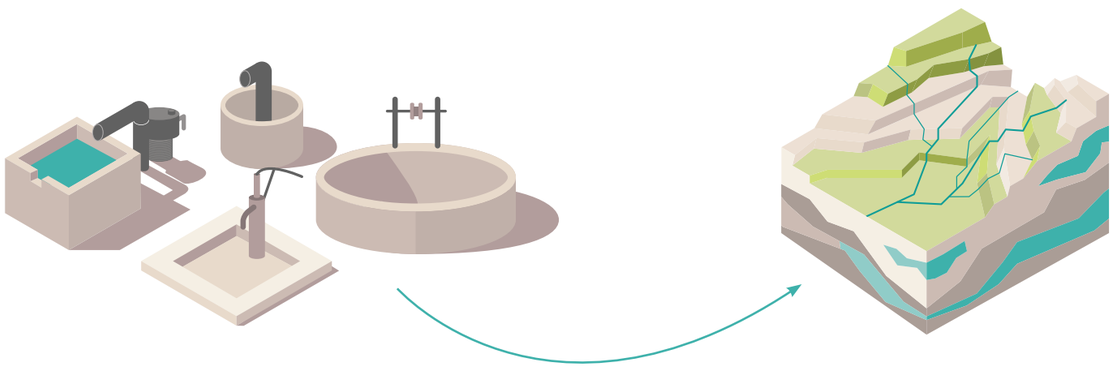
In 2004, an alarming 28%[1] blocks in the country were in the category of semi-critical, critical and overexploited as compared to 7% in 1995

1 (2007), Planning Commission, 'Groundwater Management and Ownership: Report on the Expert Group, Government of India.

The Central Ground Water Board monitors groundwater in India and maps it according to groundwater blocks. Depending on the extent of groundwater development, these blocks are categorized as either 'safe' (less than 70% developed) , 'semi-critical' (70-90%) , 'critical' (between 90 and 100%) or 'overexploited' (more than 100% development). This map indicates groundwater levels in 2011

Groundwater vulnerability in India : A quick glance

Development to Management
A pragmatic move



Groundwater Sources

Groundwater Resources

PARADIGM SHIFT

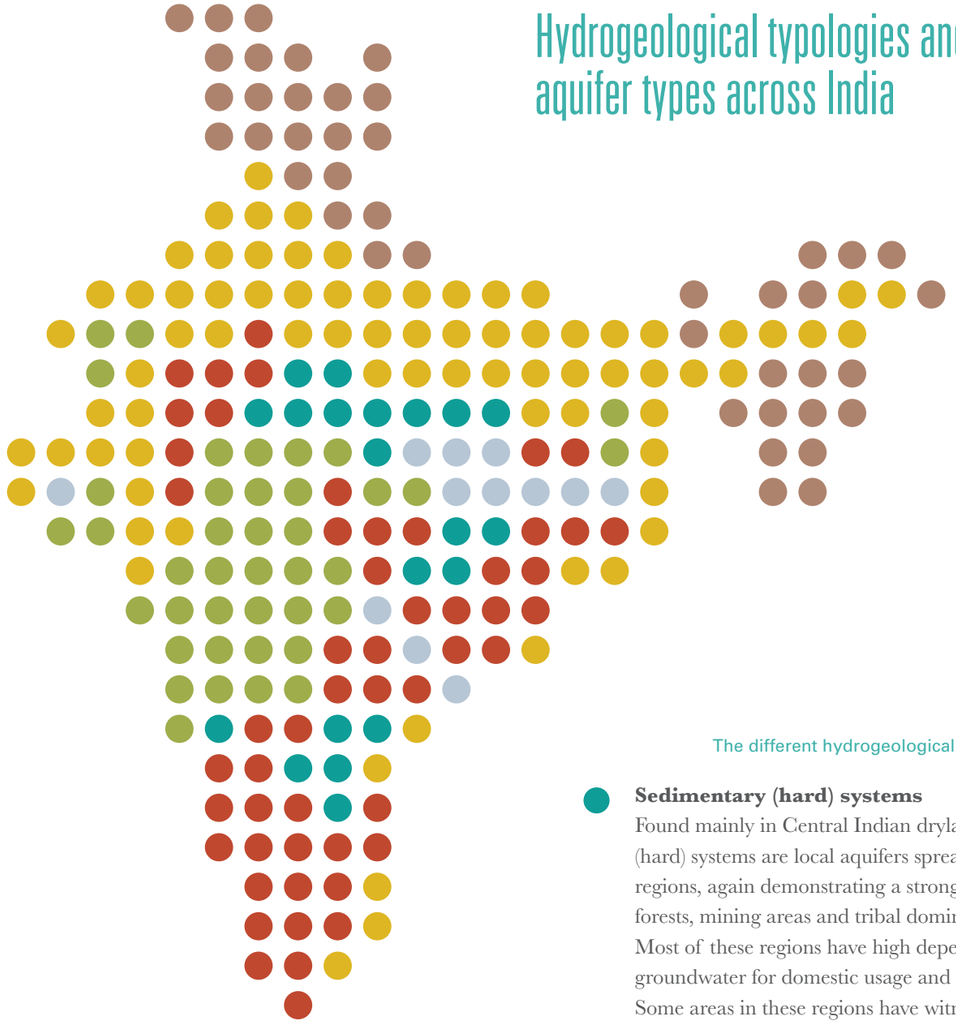
Water security is widely recognised as one of the major challenges to India's economic and social development. Today, millions of groundwater users spread across different physical, climatic and socio-economic settings are water vulnerable. Water security for them - access, quality, quantity and reliability of drinking water - is a big challenge. The need to focus on water security is urgent, as is the need to understand groundwater management techniques. Groundwater management in India has so far been about "locating water" or "identifying a site for a well". It is still bound to sources (wells) rather than resources (aquifers). What needs to be understood is that wells are only mechanisms for accessing aquifers. Understanding aquifers is the need of the hour - understanding their user base, the reasons for their depletion or deterioration, as well as effective techniques for their recharge and discharge.

The process of groundwater management is inextricably linked with the understanding that groundwater is a 'common pool resource' (Common Pool Resources or CPRs are natural or human-made resources where one person's use subtracts from another's use and where it is often necessary, but difficult and costly, to exclude other users outside the group from using the resource)[1]. Groundwater is presumed private property by many and free riding is common in the absence of understanding of groundwater boundaries. Also, there is a very high degree of diversity in groundwater resources which is not perceived easily, making it a challenge to understand and manage.

Several approaches of groundwater management have been tried in recent times. In the following chapter, we will do a comparison of those approaches to see what has worked and what can be the way forward. The one thing that is clearly emerging is that an ideal groundwater management approach will be one that will not only construct structures but also make an effort to sensitize and involve the community to work on the issue. There is an urgent need for a concerted effort to integrate science and community participation for groundwater management.

1 (1990) Ostrom E., Governing the commons: The evolution of institutions for collective action, Cambridge University Press

Hydrogeological typologies and aquifer types across India



The different hydrogeological typologies in India

Mountain systems
Found mainly in the Himalayan region, mountain systems are local aquifers found over a large region that feeds springs and streams. They demonstrate higher dependency for drinking water on springs and spring-fed streams than on wells. Land-use change and climate are factors of immediate concern around this resource's sensitivity.

Alluvial (unconsolidated) systems
Alluvial systems are unconsolidated river and aeolian sediments that deposit in vast plains, largely within the Indus and Ganga river basins typified by multiple regional aquifer systems. Groundwater quality in these regions is a major concern.

Sedimentary (soft) systems
Sedimentary (soft) systems are regional aquifers found over smaller regions in Central Indian drylands. They have a strong coherence with forests, mining areas and tribal dominant regions - regions that have higher dependency on groundwater for domestic usage.

Sedimentary (hard) systems
Found mainly in Central Indian drylands, sedimentary (hard) systems are local aquifers spread over smaller regions, again demonstrating a strong coherence with forests, mining areas and tribal dominant regions. Most of these regions have high dependency on groundwater for domestic usage and agriculture. Some areas in these regions have witnessed significant extraction of groundwater.

Volcanic systems
Volcanic systems are found over large regions and are the most heterogeneous of all aquifer systems. With limited amounts of storage, these aquifers often lead to some degree of self-regulating storage. Long term declines of these systems lead to constrained agricultural growth. Relatively better water quality levels can be found here.

Crystalline (basalt) systems
Crystalline systems are local to sub-regional aquifers found over large regions. These regions have a high dependency on groundwater for drinking water and agriculture. Groundwater markets arise primarily around rural to urban groundwater transfers. Fluoride tends to be a major contaminant in these systems.

Source : (2015) Kulkarni et al, Shaping the contours of groundwater governance in India, Journal of Hydrology : Regional Studies

Groundwater management approaches
A critical look

Most mainstream approaches such as watershed development programs have mainly focused on augmenting groundwater recharge. The number and range of watershed programs continue to increase since the 1980s; some reports suggest Government of India has invested over US$500 million[1] per year for rehabilitation of watersheds.
In watershed programs, the onus is on 'treatment' of watersheds rather than any consideration of aquifers. Groundwater problems, even in excellent watershed programs have emerged parallel to the programs. As farmers dig-and-drill on the back of such programs, with the notion of unlimited augmentation within underlying aquifers, the very purpose of public investment lies defeated.

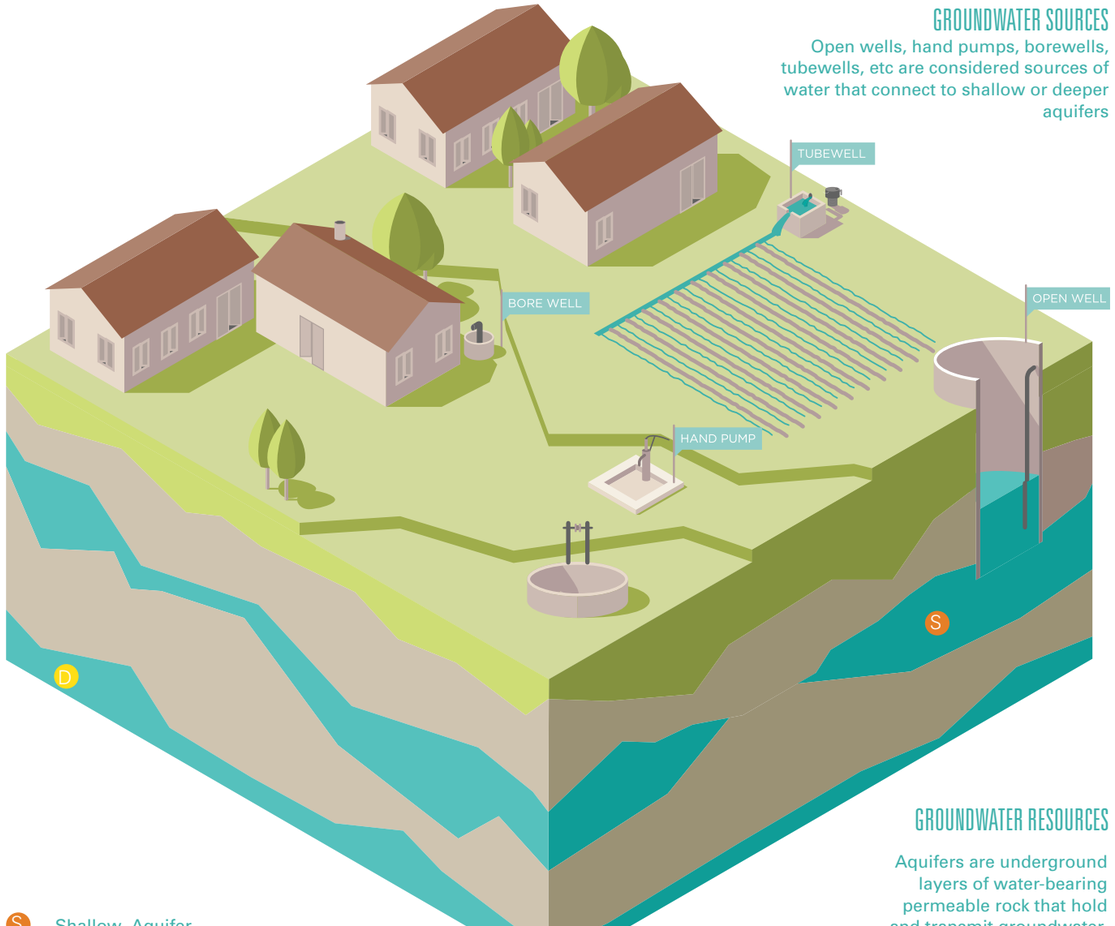
Thus several groundwater approaches have failed owing to:

- A lack of understanding of the importance of scale in groundwater resources.
- Neglect of the magnitude of diversity - geological, climatic and socio-economic factors that govern groundwater resources.
- The focus is mostly on supply augmentation without regulating demand.
- A lack of understanding of groundwater as a 'common pool resource'.
- Missing policy and regulations on groundwater.
- Failure to demystify the science of groundwater management.
- Due priority not given to drinking water.

The approaches adopted so far lack a comprehensive understanding of groundwater resources and decentralised approaches that give rise to an engaged and well-informed participation by all stakeholders and communities. There is a need to bring about a fresh paradigm of looking at groundwater management – that includes supply augmentation, demand management and resource-based interventions. To achieve this, participatory approaches that involve communities become key.

1 Adaptation Technology: Benefits of Hydrological Services - Watershed Management in Semi-Arid Region of India, Department of Civil Engineering, Tokyo Institute of Technology, Tokyo, Japan

Farmers in Maharashtra collectively map their groundwater resources



GROUNDWATER SOURCES
Open wells, hand pumps, borewells, tubewells, etc are considered sources of water that connect to shallow or deeper aquifers

S Shallow Aquifer
D Deep Aquifer

GROUNDWATER RESOURCES
Aquifers are underground layers of water-bearing permeable rock that hold and transmit groundwater. Groundwater is typically extracted using wells

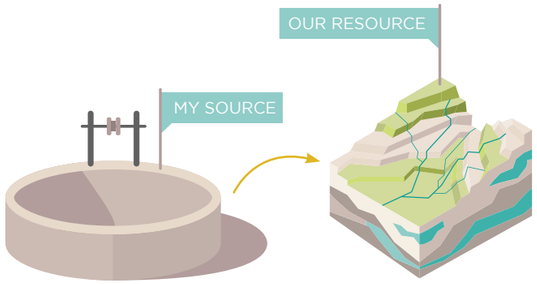
Approaches adopted so far
Solving only part of the problem

	Conserving the resource	Recharging the resource	Source based interventions	Monitoring water levels and quality	Water budgeting
Watershed approach	Strong focus	Incidental to the approach	A strong focus on the source	Seldom	Water budgeting is sometimes undertaken
Drinking water pilots	Some focus	Strong	A strong focus on the source	A strong focus	Water budgeting seldom undertaken
Crop-water budgeting	Very strong focus	Very strong	Mainly livelihood focused	A strong focus	Hydrological units – mainly watersheds

Why is participation key?

Since groundwater is an invisible[1] common pool resource, it brings with it a set of complexities about who uses and who provides. When a potential user overuses groundwater for personal consumption, it leads to a situation where it decreases the availability of water for a community. Similarly dilemmas arise about who develops and manages the water and who uses it because with a common pool resource it becomes difficult to exclude users.

Participation brings a discipline into this process of management. It brings users together to arrive at mutually-agreed decisions on usage and recharge. Simultaneously, it builds in an ethos of self-regulation and sustainable use of groundwater to be followed by all.



Overexploited individual ownership sources

Groundwater is a common pool resource

1 (2015) Kulkarni et al, *Shaping the contours of groundwater governance in India, Journal of Hydrology : Regional Studies*

Collective thinkng and action - KSS, Saharsa

Some examples of Participatory Approaches

1972

Pani Panchayat is a system of equitable distribution of water through a people's council started by Vilasrao Salunke in the village of Naigaon, which lies in the severely drought prone region of Purandhar Taluka in Pune. Today, Pani Panchayats can be found all over the state of Maharashtra.

1975

Anna Hazare's model of watershed management in Ralegan Siddhi in Maharashtra has been a successful program that has had many followers. Under this program so far, 48 nulla bunds (a crop irrigation system that involves creating lateral trenches to retain water), five cement check dams and 16 Gabion structures have been constructed.

1985

Rainwater harvesting initiative led by Rajendra Singh of Tarun Bhagat Sangh in Alwar District, the semi-arid area close to the Thar Desert built over 8600 johads (rainwater storage tanks that collect and store water throughout the year) and other water conservation structures that brought water back to over 1000 villages and revived five rivers in Rajasthan.

1995

Under the Maharashtra Government's Adarsh Gaon Yojana, the Hivre Bazaar watershed program became a model to follow. Spearheaded by Popat Pawar, 52 earthern bunds, two percolation tanks, 33 loose stone bunds and nine check dams have been built under this program.

2000s

The Andhra Pradesh Farmer Managed Groundwater System (APFAMGS) project encouraged farmers to collect local water data and make collective resource use decisions. APFAMGS has been implemented in 638 habitations clustered into 63 habitations across seven drought-prone districts of Andhra Pradesh, through nine partner NGOs till 2010.

Other ongoing participatory approaches include:

- Foundation for Ecological Security takes a micro watershed unit for water balance and planning groundwater use along with communities in Rajasthan, Madhya Pradesh and Andhra Pradesh.
- Advanced Center for Water Resources Development and Management (ACWADAM) and Samaj Pragati Sahayog in Madhya Pradesh are working on knowledge-based, typology-driven aquifer-management strategies similar to those of Pani Panchayats.
- The use of a water budgeting tool known as the Jal Chitra by Barefoot College in Tilonia, Rajasthan.

Introducing Participatory Groundwater Management (PGWM)

Participatory Groundwater Management (PGWM) is a collaborative program between Arghyam and partner NGOs across India to build a sustainable model for groundwater management. Groundwater is a common pool resource (CPR) by definition, but its management seldom reflects CPR principles. PGWM is an aquifer-based and community-centric approach that has emerged as an alternative for managing groundwater as a common pool resource.

The current, conventional knowledge base on groundwater has little space to fill the existing gaps between what is desired in practice and policy and the academic pedagogy of groundwater. This major challenge is addressed in the program by enabling the local communities to take informed decisions about water use, cropping pattern and crop water management through water budgeting.

PGWM Principles

- Groundwater is a common pool resource.
- Use an aquifer-based understanding for groundwater management.
- Groundwater management must be understood across different uses.
- The units of groundwater management should be aquifers, watersheds and habitations.
- Groundwater management requires long term engagement.
- Management should catalyse community action.
- Groundwater management should integrate formal and peoples' knowledge.

PGWM is currently working with five core partners, six Springs Initiative partners (The Springs Initiative is a network of organisations working on springshed management and water security in mountainous regions) and six other partners all covering 12 states and six major hydrogeological typologies across India.

PGWM Implementation
Aquifer-based approach

Trained para-hydrogeologists at work in Gujarat

RESOURCE CENTRES

Advanced Center for Watershed Resources Development and Management (ACWADAM)

ACWADAM is a not-for-profit organisation that aims to develop solutions to groundwater problems of today and tomorrow. It is a premier education and research institution that facilitates work on groundwater management through action research programs and trainings. ACWADAM is based in Pune, Maharashtra.

Arid Communities and Technologies (ACT)

ACT is a professional voluntary organisation based in Bhuj, Gujarat. ACT strives to strengthen livelihoods in arid and semi-arid regions by improving access to technological and institutional solutions for resolving ecological constraints in collaboration with communities.

Watershed Support Services and Activities Network (WASSAN)

WASSAN works towards bringing about a qualitative change in watershed based development programs in India, providing capacity building and support services for development initiatives in natural resources management with a focus on promoting livelihoods, economic and gender equity among the poor. WASSAN is based in Hyderabad, Telangana.

People's Science Institute (PSI)

PSI is a non-profit research and development organisation working to eradicate poverty through the empowerment of the poor and the productive, sustainable and equitable use of available human and natural resources. It works with communities, implements development programs and undertakes public interest research. PSI is located in Dehradun, Uttarakhand.

Megh Pyne Abhiyan (MPA)

MPA is a public charitable trust committed towards behavioural change amongst the rural communities to effectively revive, innovate and institutionalise water and sanitation management practices. It also works towards mainstreaming issues concerning flood, drought, and groundwater management through collective accountability and action. MPA works through a network of grassroots organisations, resource institutions and individuals in north Bihar (Supaul, Saharsa, Khagaria, Madhubani, and Pashchim Champaran) and Jharkhand (Dhanbad).

PGWM ECOSYSTEM

Core PGWM Resource Centres
The Springs Initiative
Other partners in the ecosystem
Academia
Government Programs and Institutions

Core PGWM Resource Centres

1. Advanced Center for Watershed Resources Development and Management (ACWADAM)
2. Arid Communities and Technologies (ACT)
3. People's Science Institute (PSI)
4. Watershed Support Services and Activities Network (WASSAN)
5. Megh Pyne Abhiyan (MPA)

The Springs Initiative[1]

1. Himmothan, Himalaya Seva Sangh (HSS) and Central Himalayan Rural Action Group (CHIRAG)
2. Keystone Foundation
3. Grampari
4. Vishakha Jilla Nava Nirmana Samiti (VJNNS)
5. Government of Sikkim (Dharavikas)
6. Government of Meghalaya

Other partners

1. Balvikas, Accion Fraterna, Rural Integrated Development Society (RIDS), Rural and Environment Development Society (REDS)
2. Samaj Pragati Sahayog (SPS)
3. Kosi Seva Sadan, Water Action, Gramyasheel, Ghoghardiha Prakhand Swarajya Vikas Sangi (GPSVS), Samta
4. Ecosphere, Rural Communes
5. Chinmaya Organisation for Rural Development (CORD)
6. Kalimpong Krushak Kalyan Sanghtan

Academia

1. Gujarat Vidyapith
2. Bhuj University
3. Pune University
4. Maharana Pratap Agriculture University and Krushi Vigyan Kendra
5. Garhwal University

Government Programs and Institutions

- Neeranchal (a UNDP program)
- Groundwater Surveys and Development Agency (GSDA), Maharashtra
- Indira Jala Prabha, Andhra Pradesh

The following are not incorporated in the map

- Integrated Water Management Program (IWMP)
- National Bank for Agriculture and Rural Development (NABARD)
- Rashtriya Krishi Vikas Yojna (RKVY)
- Revitalising Rainfed Agriculture Network (RRA)
- National Project on Aquifer Management (NAQUIM)
- CSR and other private foundations

1 The Springs Initiative is a network of organisations working on springshed management and water security in mountainous regions

Why PGWM and how it works
Objectives and intervention areas

The PGWM approach focuses on a scientific understanding of the resource, building capacities of local communities and defining usage priorities. It demonstrates that groundwater management is based on effective partnerships with institutions and local communities. It aims for a sustainable and equitable management of groundwater resources by promoting a shift in controls by states to management by user groups, and moving from attending to crises after they occur to averting them. Such an approach leads to redefining the scope of public investments, technologies, access to resources, production systems and markets. It provides an alternative and acknowledges the way forward.

A typical PGWM program design is built on three pillars: Action Research, Capacity Building and Advocacy. Put together, these pillars play a vital role in making PGWM a holistic model.

Action Research is research that is done to understand the specific groundwater related problem of a specific location or typology and to pilot appropriate solutions to address that problem. The solutions are customised and are arrived at after a proper understanding of the resource, situations and the socio-economic conditions of the people in that location.

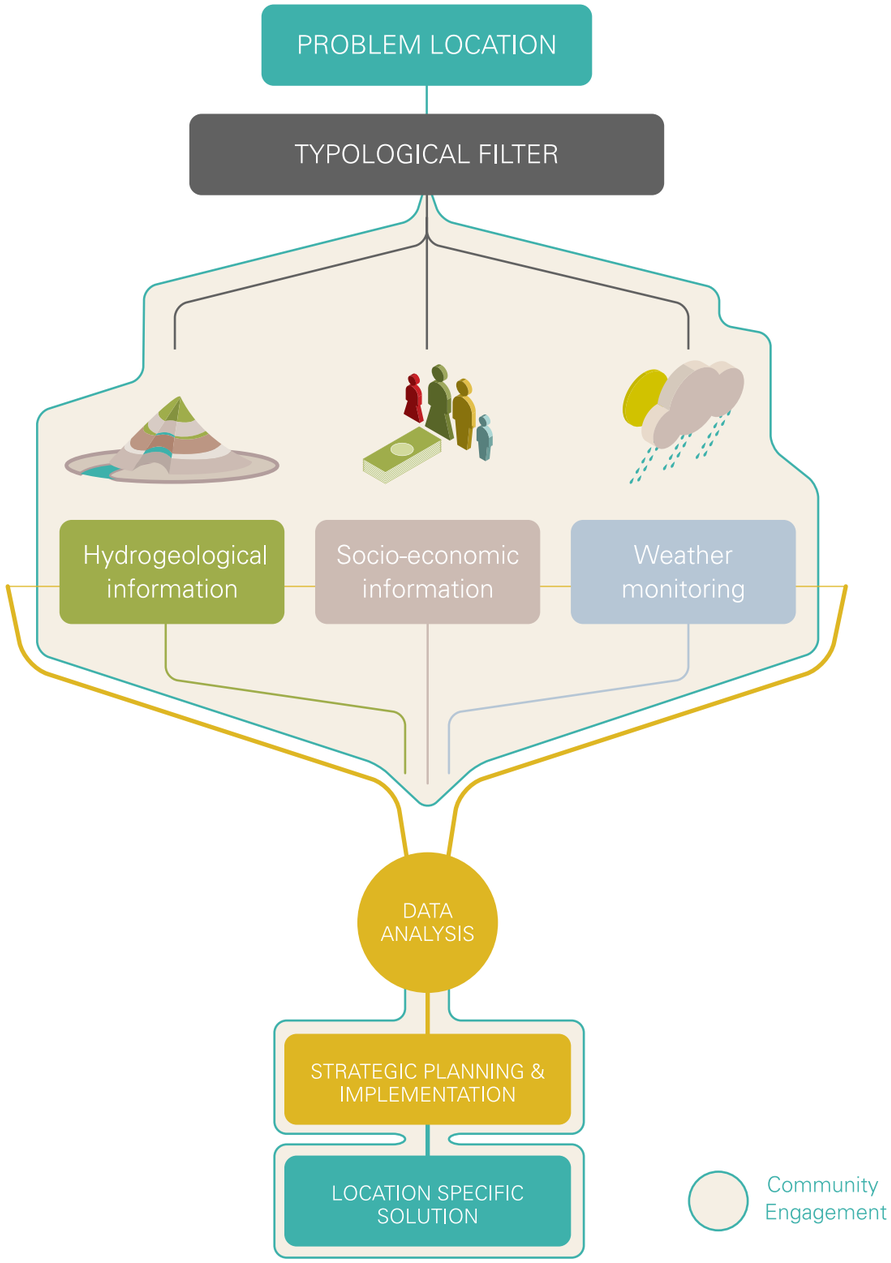
Capacity building is that function of PGWM that engages with the communities it works in the most. It ensures collaboration and partnerships with communities and promotes the ownership of practices and protocols by communities. It integrates formal and peoples' knowledge into its processes and action.

Advocacy of PGWM is aimed at influencing decisions related to groundwater management at the national and state level. Advocacy engages with key stakeholders and programs to embed a groundwater based thinking.

PGWM Action Research sites

- Mehsana District
  Kutch District
  Rapar District
- Sirmour District
  Solan District
- Pune District
  Satara District
- Ranga Reddy District
  Mahbubnagar District
  Anantapur District
- Supaul District
  Khagaria District
  Madhubani District
  Paschim Champaran District
  Saharsa District

PGWM on the ground : the Action Research



The three pillars of PGWM

ACTION RESEARCH

The locations for action research pilots are chosen to represent at least four of the six hydrogeological typologies in India.

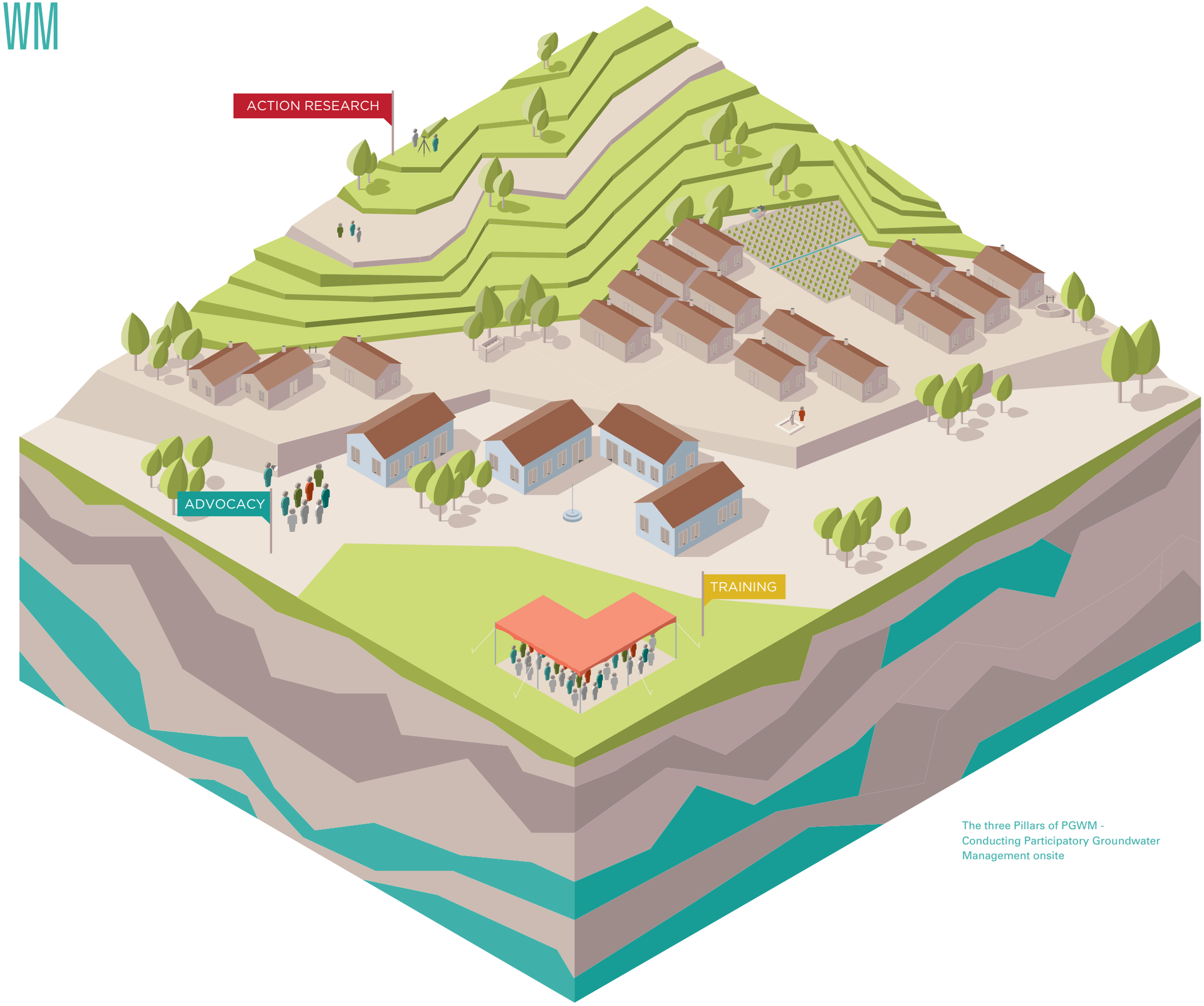
- Identify PGWM sites based on the crisis (resource-based) and need felt (community-interface).
- Collect and analyse data and baseline information (toposheet, cadastral maps, direct project reports etc).
- Conduct geological mapping.
- Establish monitoring processes.
- Conduct orientation and training of the implementing staff.
- Conduct socio-economic surveys.
- Conduct pumping tests and water quality analysis twice a year.

TRAINING & CAPACITY BUILDING

- Inject strong scientific principles into groundwater related programs in different regions across India.
- Facilitate participatory processes based on local hydrogeology in four-five different hydrogeological settings.
- Develop broad protocols for systematic, sustainable and equitable utilisation of groundwater and to inculcate these as part of a training regimen.
- Develop strong monitoring mechanisms of observations, measurement and analysis.
- Develop and enhance capacities of local para-hydrogeological professionals.

ADVOCACY

- Promote advocacy towards proper understanding and appreciation of the groundwater resources and their management among various stakeholders, particularly policy makers and decision makers.
- Promote local level knowledge and skill base.
- Influence major mainstream programs, such as watershed, drinking water, sanitation, National Rural Employment Guaranteee Act (NREGA), etc.



The three Pillars of PGWM - Conducting Participatory Groundwater Management onsite

PGWM
IMPACT STORIES

Helping a water-stricken village in Maharashtra achieve drinking water security

In the drought prone village of Randullabad in Satara district of Maharashtra, a three year long watershed development project undertaken with PGWM principles brought the village back from the brink of drinking water scarcity crisis to becoming to a water-sufficient village. The project involved recharge of regional aquifers, geological mapping, testing of water quality and establishing usage protocols for drinking and irrigation. Drilling of borewells was banned and 90% of wells in the village were used on a sharing basis as farmers took turns to irrigate their lands. Groundwater recharge and discharge areas were demarcated. As a result of these interventions, groundwater levels have improved and local water structures have been revived. The impact of the program is seen in improved kharif productivities, improvement in irrigation and water use efficiency, improved equitability particularly for farmers and improved drinking water security.

Randullabad - a journey from water scarcity to water security

How social regulation in five villages in Himachal Pradesh ensured enhanced water quality

The villages of Luhali, Dhyali, Sattar-bhadon, Thanakasoga and Dandor in Himachal Pradesh faced water shortage and water quality problems such as bacteriological and chemical contamination. A PGWM action plan was conducted to remedy this. A survey was conducted and it was found that despite being located on different sides of the valley, these five villages shared a common aquifer system. This fact was hitherto unknown so awareness activities were extensively conducted which included informing villagers about the contamination and establishing a sanitation protocol for the five villages to follow. A Water Management Committee and Water User Groups (WUG) were formed to put together a set of social regulations that included giving villagers responsibility of protecting, recharging and cleaning their mutual resources. Thanks to the implementation of PGWM, recharge work, source protection and discharge of the springs increased over the course of the intervention. Water quality improved when the level of bacteriological and chemical contamination decreased. Social fencing was one of the major outcomes of this program as recharge sites were protected.

Protecting springs in Himachal Pradesh

Tapping into the local talent and training them to become para-hydrogeologists

Capacity building is one of the key areas PGWM focuses on. In a span of three years, a cadre of hundreds of para-hydrogeologists has been built. These professionals are chosen from groups of local youth, government staff and local NGO staff who work on the ground. They learn, among other aspects of PGWM, how to make groundwater and aquifer maps.

Additionally, extensive training programs spanning over weeks are conducted for management and decision making officials of organisations, networks, governments, technical assistants, watershed assistants of IWMP (the Government's Integrated Watershed Management Program) and more. In Gujarat alone, in three years 1815 people have been trained and made ready to work on groundwater management.

Local talent leading from the front
Veljibhai, a para-hydrogeologist

Borewell pooling – reducing Telangana farmers' burdens substantially

For farmers in Telangana, borewell drilling was proving to be a very expensive way to extract groundwater. Several farmers were unable to repay the loans they had taken for drilling, leaving them worried and anxious about their future. Under a PGWM project – *Karavu Kavacham* (the Drought Shield Program), an experiment was conducted with five borewells and five farmers in a single watershed. The outcome of the experiment was introduction of the concept of borewell pooling wherein borewell farmers shared water with non-borewell farmers. A water grid was created by connecting the wells through a long pipeline with several outlets to reduce wastage by seepage and evaporation. Water conservation was an immediate outcome, financial condition of the farmers improved and drinking water was made available throughout the year.

Borewell pooling – a boon for Telangana farmers
Gamlibai, a farmer from Ranga Reddy district

PGWM recommended in the 12th Five Year Plan by the Planning Commission

As a result of concerted advocacy at the national level, the 12th Planning Commission Report of the Government of India recommended PGWM. Participatory principles have also been incorporated into the Central Groundwater Board's National Aquifer Mapping Program (NAQUIM). PGWM is also one of the key programs that is building capacities of personnel working on the Government of India's Integrated Watershed Management program (IWMP). Other collaborations include integration of PGWM in NABARD-funded watershed projects, implementing guidelines for water management for the National Rural Drinking Water Program (NRDWP) and National Rural Employment Guarantee Act (NREGA), collaborations with state governments, NGOs, private foundations, corporate agencies and institutions.

Workshops, seminars across 20 states and publications in five languages

PGWM Resource Centres have so far conducted training programs, workshops, seminars, field visits for over 30 state and non-governmental organisations, regional offices of Groundwater Surveys and Development Agency and Central Groundwater Board and several district level administrations, academic institutions, and village level institutions such as gramsabhas across 20 states. An entire gamut of handbooks, groundwater primers, reports, papers, manuals, books have been published in English, Hindi, Marathi, Gujarati and Telugu languages.

PGWM
What next?

In its first phase, PGWM piloted its approach under the framework of its guiding principles in 70 villages across five states. The program effectively proved its concept by enabling drinking water and livelihood security in these villages. These pilots achieved the following outcomes among the communities:

- Understanding and acceptance of groundwater as commons.
- Knowledge and understanding of springs as sources of groundwater.
- Community ownership of the PGWM concept, enabling better understanding and management of the resource thereby ensuring equity in its distribution.
- Understanding of long-term sustainability of the resource demonstrated by the practice of supply augmentation in conjunction with demand management.

There is also evidence to prove that these villages were more resilient in securing drinking water and water for agriculture in adverse climatic conditions. In rainfed areas, they not only secured drinking water but multiplied their incomes through well-managed irrigation patterns, changing cropping patterns and increasing areas under irrigation by pooling resources. They also took simple measures like social protection in the catchment areas of springs to prevent the contamination of drinking water.

The lessons from the first phase point to the need for capacity and institution development at the local level. While 50 para-hydrogeologists out of the 5400 people trained are now actively involved in developing water security plans, moving towards the second phase at the village level, there are many more required to take this effort across the length and breadth of the country. The Springs Initiative that emerged as an offshoot of the larger PGWM effort has now quickly spread to ten states. Of these, in Meghalaya and Sikkim, the government is pioneering the implementation of the springshed management with support from PGWM partners. Despite these initial successes, challenges remain to scale up the effort. It can happen primarily through the involvement of the Government and investments from multiple sources.

If this concept had a legal anchorage by way of a public policy, committed investments and a dedicated human resource - it might be a little easier to conserve this intergenerational resource for delivering safe and sustainable water for all. This would be the mission for the next phase. The program could also effectively leverage existing public investments like IWMP, NREGA, forest department schemes which enhanced the efficiency of these investments for water security.

PGWM Resource Centres

Advanced Center for Watershed Resources Development and Management (ACWADAM)

Arid Communities and Technologies (ACT)

People's Science Institute (PSI)

Watershed Support Services and Activities Network (WASSAN)

Megh Pyne Abhiyan (MPA)

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