

NATIONAL PROJECT ON AQUIFER MANAGEMENT (NAQUIM)

**Participatory Approach to Aquifer Mapping &
Management**

by

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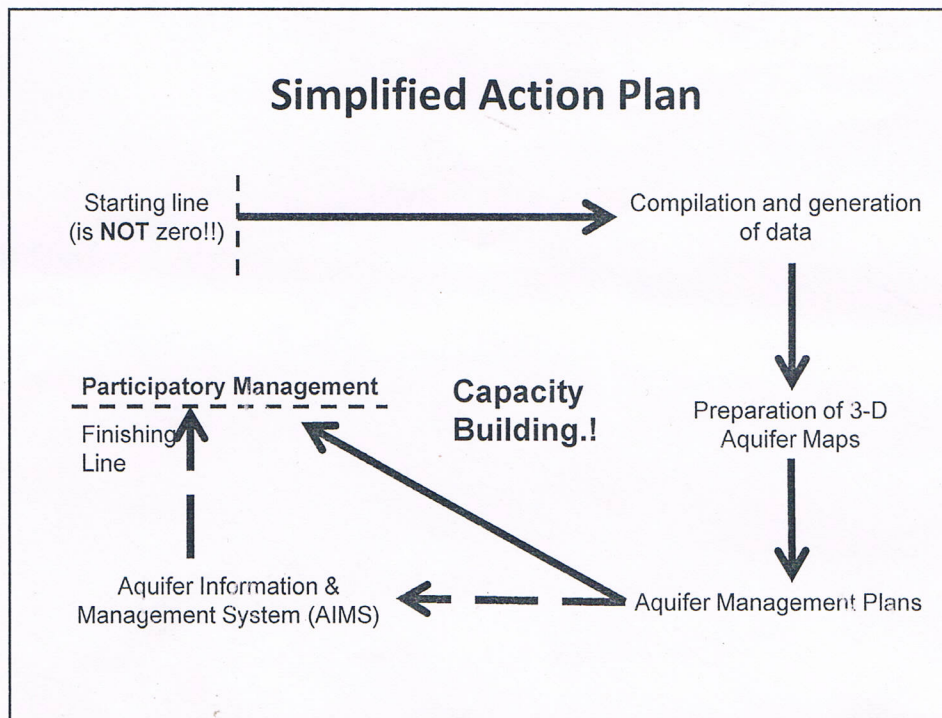
Sum up

- from the earlier presentation by AS (WR)

“Know your Aquifer...Manage your Aquifer...!”

So what is the Essence?

- Demystification of Science of Hydrogeology
- Infusion of a sense of ownership amongst stakeholders.
- Effort by Government and community to work in tandem for sustainable and equitable management of ground water.

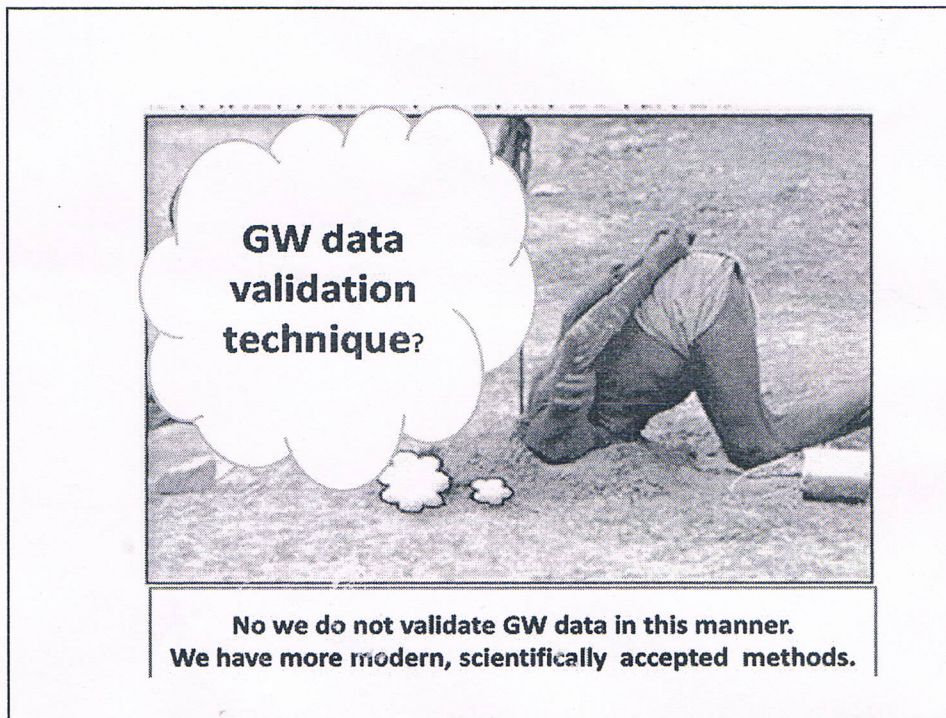


Aquifer Mapping

“Know your Aquifer...Manage your Aquifer...!”

Some salient features... (In context of NAQUIM)

- 3-D disposition and not merely a 2D Map
- Aquifer characteristics like Transmissivity, Storativity, Specific yield, etc. etc..
- Aquifer disposition, ground water modeling, resource estimation – dependant on number of data points and accuracy of data.



Participatory Ground water Management (PGWM)

“Know your Aquifer...Manage your Aquifer...!”

Some Questions...!

- Why do we need PGWM?
- What are the Objectives & Outcomes of PGWM?
- Who are the partners and who are the facilitators?
- What is the role of partners and facilitators?
- What about capacity building?

PGWM – Why??

“Know your Aquifer...Manage your Aquifer...!”

Rationale

- *“Comprehensive mapping of India’s aquifers, on a priority, must become the cornerstone of developing any groundwater management programme on scale”*

– Working Group on Sustainable Ground Water Management constituted by the Planning Commission

PGWM – Why??

“Know your Aquifer...Manage your Aquifer...!”

Rationale

- Indian Easement Act, 1882, Land Acquisition Act, 1894.. etc.. etc..
- The goal of a PGWM should be *equitable, safe and sustainable management of India’s groundwater resources through improved systems of Aquifer mapping, utilization, awareness and governance.*

PGWM – Why??

“Know your Aquifer...Manage your Aquifer...!”

Rationale

- Implementation of an integrated aquifer mapping and groundwater management programme is possible only through strong partnerships between various stakeholders.
- Stakeholders Participation contributes towards conservation, management and protection of reources

PGWM – Why??

“Know your Aquifer...Manage your Aquifer...!”

Past Experience

- PGWM is still in nascent stage and evolving gradually in India.
- It essentially involves communities observing groundwater data and attempting local-level, groundwater planning and management.
- Aimed at augmentation, conservation and improving patterns of groundwater use.

PGWM – Why??

“Know your Aquifer...Manage your Aquifer...!”

Few key questions...

- Can the local people identify and understand the complexities associated with occurrence, storage and withdrawal of ground water?
- What is the reliability of data collection and analysis done by local people?
- Can the community and stakeholders be trained in scientific data collection and simple analysis?

PGWM – Why??

“Know your Aquifer...Manage your Aquifer...!”

And the answers.....

- There are knowledge-based localized PGWM projects(e.g. APFAMGS and some other projects by ACWADAM, FES, INREM, Hiwre Bazar etc.).
- Demonstrated the efficacy and reliability of data collection and analysis for PGWM of dynamic resources of phreatic aquifers.
- Involvement and support of Government machinery is the key.

PGWM – Objectives & Outcomes??

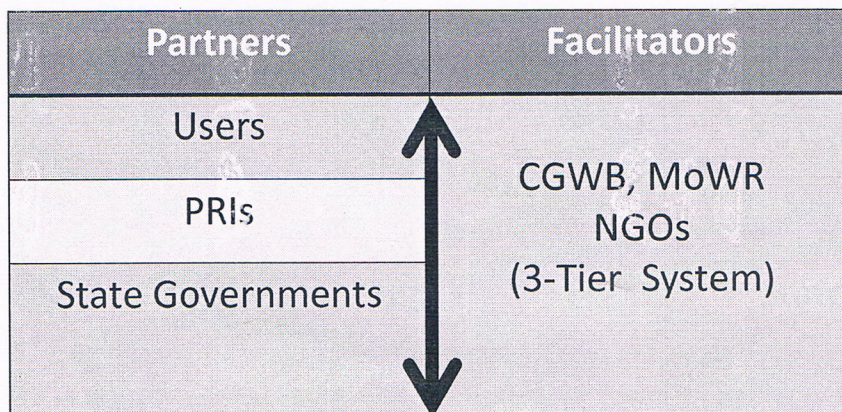
“Know your Aquifer...Manage your Aquifer...!”

Objectives & Outcomes

- Enhanced capacity building of ground water users and stakeholders.
- Greater accuracy in collection of ground water data and analysis.
- Efficient management of ground water.
- Informed decision making on cropping pattern.
- Increased ground water use efficiency

PGWM -- Partners & Facilitators

“Know your Aquifer...Manage your Aquifer...!”



PGWM – Partners’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

State Governments

- Water is a State subject – Role of State Governments is paramount.
- SGWCC & SGWRC
 - Preparation of Aquifer Maps
 - Preparation of Aquifer Management Plans
 - Coordination & implementation of PGWM

PGWM – Partners’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

Panchayati Raj Institutions

- Actual implementation of various activities particularly w.r.t. participatory arrangement
 - Identification of para-hydrogeologists with the help of SIPs & DSOs (essentially NGOs)
 - Awareness raising
 - Mobilising Community based PGWM.
 - Dovetailing with other schemes of the government

PGWM – Partners’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

Users – the key players..!!

- They are the key for success of any PGWM.
- lessons to be learnt from APFAMGS etc.
- Role starts right from Aquifer Mapping stage to preparation of Aquifer Management Plans and PGWM through
 - para-hydrogeologists
 - Water Users Associations etc.

PGWM – Partners’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

Users – the key players..!!

- Participatory hydrogeological monitoring e.g. well inventory, water level, rainfall, water sample collection etc.
- Submitting the data/samples to Govt. machinery for detailed analysis.
- Simple Ground Water Budgeting
- Crop water budgeting

PGWM – Partners’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

Users – the key players..!! – Para-hydrogeologists

- Para-hydrogeologist (PHG) is envisaged to be a village youth, literate & preferably 12th pass.
- He / She should have a desire to learn and engage in village-water problems.
- Estimated that during the XII Plan, about 17,000 PHGs in rural areas and about 3,000 PHGs in urban areas would be required.

PGWM – Facilitator’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

CGWB, MoWR

- CGWB is the nodal agency for implementation of NAQUIM.
- Prepare a State specific Working Plan in consultation with State governments
- Shall assist States in preparation of Aquifer Maps and Aquifer Management Plans adopting the latest technologies being used world-wide.

PGWM – Facilitator’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

CGWB & MoWR

- Assessment of institutional strengthening and capacity building needs of States.
- Provide requisite instrument/ hardware/ software etc. to the States/PRIs/Users/NGOs etc.
- Arrange to provide trainings to State Government officers on various aspects through national & international experts/consultants.

PGWM – Facilitator’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

NGOs - Technical Service Agency.

- Consortium of National level NGOs
- Responsible for identification of State Implementation Partners (SIPs), i.e. State level NGOs.
- Imparting trainings to SIPs (ToTs)
- Preparation of standard training modules and protocols for PGWM

PGWM – Facilitator’ Roles??

“Know your Aquifer...Manage your Aquifer...!”

NGOs – State Implementation Partners (SIP) & District Support Organisations (DSOs)

- Work under the SGWCC & SGWRC
- Responsible for
 - identification of PHGs in consultation with SGWRC/SGWCC.
 - Imparting trainings to PHGs and holding awareness programmes.
 - Compiling information collected from various PHGs at District levels and submitting the same to SGWRC.

PGWM – Capacity Building

“Know your Aquifer...Manage your Aquifer...!”

- **Trainings for PGWM**
 - ToTs etc. to be conducted by the TSA in all States
 - SIPs to train the local youth (PHGs) in simple concepts and aspects of ground water
 - Trainings to be imparted on collection of data and samples
 - Trainings on simple water budgeting of dynamic ground water resources in the phreatic aquifers and associated crop water budgeting etc.

PGWM – Capacity Building

“Know your Aquifer...Manage your Aquifer...!”

- **Equipment for PGWM**

- Training needs assessment to be done by TSA & SIPs
- Equipment needed for PGWM (measuring tape, water quality testing kits, etc.) to be assessed, procured and provided as per needs to –
 - SGWRC
 - NGOs
 - PHGs

Issues to ponder & deliberate

“Know your Aquifer...Manage your Aquifer...!”

- **How to evolve a robust PGWM?**



- **Seldom spontaneous – needs to be supported by the government and the facilitators.**
 - Awareness raising
 - Capacity building at various levels
 - NGOs and Government institutions to play vital role

Issues to ponder & deliberate

“Know your Aquifer...Manage your Aquifer...!”

How to evolve a robust PGWM?

- Institutionalisation of PGWM–
 - Participation of all sections of stakeholders (irrespective of the size of land holdings) and WUA or GWUA need to formulated.
 - WUA should not be limited to supply side, but also include demand side management
 - Aquifer management needs to address stressed or high yielding; command or non-command aquifers etc.



Aquifer Mapping

“Know your Aquifer...Manage your Aquifer...!”

What is the Mantra...?

'Count what is countable, measure what is measurable. What is not measurable, make measurable..!'

- Galileo

