



Environment

Water & Environmental Sanitation Network
(WES-Net India)



Solution Exchange for WES-Net India Consolidated Reply

Query: Community Participation in Ground Water Management, from Pragmatix, Gurgaon (Comparative Experience)

Compiled by Preeti Soni, Resource Person and Moderator; additional research provided by Ramya Gopalan, Research Associate
8 November 2005

Original Query: AJ James, Pragmatix Research & Advisory Services Pvt. Ltd. Gurgaon, Haryana

Posted: 14 October 2005

I have been an interested follower of water resource management for several years now, and am particularly interested in practical, local level measures.

There have been a few detailed technical studies of water flows in a single watershed, including the DFID-supported WHIRL (Water, households and rural livelihoods), COMMAN (Community Management of Groundwater Resources in Rural India), and AGRAR (Augmenting groundwater resources by artificial recharge) projects, the Indo-French initiative at NGRI in Hyderabad, work done by VIKSAT in Ahmedabad, TWAD Board in Madurai and ACWADAM in Pune. And there are some interesting cases of community management of surface water bodies like *kuhls* and tanks in South India (e.g., by the Dhan Foundation and others).

But I am yet to come across good documented cases of local community-level water management practices – especially in planning conjoint water use, setting and enforcing penalties, etc. – that have evolved or have been implemented in the case of ground water. Does anyone have any experience in and know of such cases of community participation in groundwater management? What is the experience in different parts of India? Or is it really too utopian to expect to find such cases and should we simply give up and accept the inevitable fact that groundwater in India will be exhausted in a few years time?

Responses received with thanks from:

1. [Kalika Mohapatra](#), UNDP, Orissa
2. [Bharat R. Sharma](#), IWMI, New Delhi
3. Dinesh Kumar, IWMI, Anand ([Response 1](#), [Response 2](#))
4. Shashidharan Enarth, Development Support Centre, Ahemdabad ([Response 1](#), [Response 2](#))

5. [G. Misra](#), Directorate of Economics & Statistics, Port Blair
6. [Nupur Bose](#), Department of Environment and Water Management, A. N. College, Patna
7. [Prabhjot Sodhi](#), UNDP GEF SGP, New Delhi
8. [Srikanth](#), WaterAid, New Delhi
9. [Javeen Jairath](#), CapnetSA, Hyderabad

Further contributions are welcome!

Summary of Responses

The query seeks to identify documented cases of local community level water management practices in the context of ground water management. Although there are several examples of community based water management across the country, those specifically for groundwater management and in particular the documented ones are few. The Network members have provided useful examples of groundwater management practices and also brought out the complexity in dealing with this issue at the community level. Although interesting, many a times the discussion diverted from the original query indicating further the inherent complexities of the issue.

Experiences have been presented by Network members showcasing different ways by which communities have been involved in groundwater management including those in **Andhra Pradesh, Orissa, Maharashtra, Himachal Pradesh** and **Rajasthan**. The most significant is the one in **Andhra Pradesh (AP)**, wherein activities under the AP Farmer Managed Groundwater Systems Project mainly focus upon building people's institutions for groundwater management, augmentation of groundwater resource through artificial recharge and promotion of sustainable agricultural practices. In addition, in **Orissa**, the 'Pani Panchayat' programme assigns various roles to the community and the local self-government in water management and preparing community based drought management plans; and in **Ozhar in Maharashtra** water user associations are enabling farmers to manage irrigation waters. It is also reported that in **Banikhet in Himachal Pradesh** the lift irrigation project deals with various aspects of water use such was water charges, local maintenance, etc; and in **Rajasthan**, communities are participating in checks on rain water loss and thus ensuring the enhancement of groundwater.

As mentioned before members' responses have elicited aspects in community based ground water management that need due consideration. It is also suggested that the issue of groundwater management is a contextual one. A number of reasons attributing to the failure in the overall scenario surrounding effective community based ground water management have been cited, including:

- **Social and attitudinal constraints in fostering community participation:** It is important to create awareness among the community, and motivate affected or potentially vulnerable villagers.
- **Poor regulatory framework at the macro level:** Suggestions in this context are efficient planning for usage of water, strategizing and imposing penalties, etc. Legislation to control excess usage of fertilizer and pesticides may also be introduced.
- **Poor application of available technology:** To improve application of technologies, it may be useful to involve the communities from the initial stages of planning and not just in the practice and implementation stages.
- **Absence of socio, cultural or economic institutions in playing a guiding role:** For this, effective capacity building and training may be facilitated. Introducing integrated strategies (e.g. not only for direct access and use of groundwater but also to address indirect issues like metalloids contamination etc.) and guidance, and bringing in transparent and accountable governance are important issues as well.

Clearly, a well-constructed strategy needs to be adopted keeping in mind that community response plays a vital role in ultimately shaping any long term solutions to the issue of ground water management.

Comparative Experiences

Farmer Managed Groundwater Systems Project, Andhra Pradesh (from [B.R. Sharma](#), IWMI Asia Office, New Delhi)

The project aims at fostering a meaningful farmer-scientist linkage to ensure sustainable groundwater management, and addresses environmental issues surrounding groundwater and agriculture. It covers about 638 villages in seven drought prone district of Andhra Pradesh. The main activities include building people's institutions for groundwater management, augmentation of groundwater resource through artificial recharge and promotion of sustainable agricultural practices. It recognizes the importance of the farmer in charge of the groundwater management as well as the critical scientific inputs that are necessary for farmers to better understand the dynamics and complexities of the hydrological regimes within which they operate. For more details see [Andhra Pradesh Farmer Managed Groundwater Systems \(APFAMGS\) Project](#).

Pani Panchayat, Orissa (from [Kalika Mohapatra](#), UNDP, Orissa)

The Pani Panchayat Program initiated by the Government of Orissa is an effort towards efficient water management and agricultural development. By this, community members, mainly farmers participate in the operation, maintenance and management of the system by deciding the sources of water, types of sources and agricultural activities, location of watershed structures, who the users are and other beneficiaries. Also developed are alternate agricultural practices and livelihood options to help vulnerable groups. This program has enabled a feeling of ownership amongst farmers towards irrigated potentials and has thus boosted their confidence. For further information see [Pani Panchayat Program, Orissa](#).

Ozhar experiment, SOPECCOM, Maharashtra (from [Dinesh Kumar](#), IWMI, Anand)

Water User Associations (WUA's) are helping farmers to manage irrigation water. This participatory irrigation management system, also encouraged by the government, has shifted emphasis from government-appointed irrigation engineers to people who till the land, and as primary users use the water judiciously and productively. See [Blue Gold](#) for more details.).

Lift Irrigation Project, Yog Manav Trust, Banikhet (from [Prabhjot Sodhi](#), UNDP GEF SGP, New Delhi)

The lift irrigation scheme in Sali village in Chamba district was constructed by the Yog Manav Vikas Trust, Banikhet (Dalhousie). Communities have set up a Pani Panchayat cooperative with an initial token collection as a contribution from each according to their ability. After considerable informal negotiating processes the community had decided on the various aspects of water use namely charges, maintenance, etc. The NGO exposed the communities to management and book keeping. Consequently all members have formed their management body and allocated specific roles. Additionally plans have now been made to develop better agricultural practices.

Check on rainwater loss, Rajasthan (from [G Misra](#), Directorate of Economics & Statistics, Port Blair)

Initiatives have been taken in Rajasthan to mobilize the community for water conservation, which has benefited them in expanding their farming practices. The communities have participated and constructed rain water loss checking bodies, thereby facilitating enhancement of groundwater.

Related Resources

Recommended Organizations

SOPPECOM, Maharashtra (from [Dinesh Kumar](#), IWMI, Anand)

(contact: KJ Joy, joynagmans@vsnl.net)

Recommended for their experiment of setting up Water User Association (WUA's) in Ozar, Maharashtra aimed at enabling farmers to manage irrigation water

Yog Manav Trust, Chamba, Himachal Pradesh (from [Prabhjot Sodhi](#), UNDP GEF SGP, New Delhi)

www.ymvt.org (contact: Kiran Dodeja, yogmanavtrust@yahoo.co.in)

It aims to promote child development, women empowerment and environmental issues, and is recommended for its involvement in the lift irrigation project in Banikhet

Andhra Pradesh Farmer Managed Groundwater Systems (APFAMGS) Project (from [B.R. Sharma](#), IWMI, New Delhi)

<http://www.apfamgs.org/index.html>

The project addresses issues around groundwater and agriculture. The website contains project and related information on enabling farmers to manage groundwater systems in Andhra Pradesh.

Recommended Documentation

Pani Panchayat Program, Orissa (from [Kalika Mohapatra](#), UNDP, Orissa)

<http://www.orissawater.com/P.Panchayat1.htm>

The Pani Panchayat reform process initiated by the Government of Orissa involves a decision-making approach involving farmers' participation.

Further documentation identified by [Ramya Gopalan](#), Research Associate

Blue Gold

by Surekha Sule, India Nest.com, October 27, 2005, available at,

<http://www.boloji.com/wfs2/wfs231.htm>

The article provides information on the Participatory Irrigation Management (PIM) system in Maharashtra through the setting up of Water User Associations (WUA's)

Water governance in Gujarat state, India

by Gupta, R. International Journal of Water Resources Development, Volume 20, Number 2, June 2004, pp. 131-147(17), Routledge. Abstract available at

<http://www.ingentaconnect.com/content/routledg/cijw>, subscription required to access paper

Paper examines the groundwater and surface water situation in Gujarat State, India and the role of complementary rainwater harvesting and community involvement in irrigation management

Irrigation and collective action: A study in method with reference to the Shiwalik Hills, Haryana

by Kurian M; Dietz T, Natural Resources Forum, Volume 28, Number 1, February 2004, pp. 34-39(6), Blackwell Publishing. Abstract available at <http://www.ingentaconnect.com/content/bpl/narf>,

subscription required to access paper

Discusses importance of context specification through elements of a joint management contract in Haryana (India), to explain collective action in irrigation management

Tank irrigation management as a local common property: the case of Tamil Nadu, India

by Sakurai T; Palanisami K, Agricultural Economics, Volume 25, Number 2, September 2001, pp. 273-283(11), Elsevier Science. Abstract available at <http://www.ingentaconnect.com/content/els/01695150>, subscription required to access paper

Deals with the issue of resource management, comparing two management schemes for irrigation water, community (tank) and individualized (well) irrigation management regimes.

Institutional framework for managing groundwater: A case study of community organisations in Gujarat, India

by Kumar M.D, Water Policy, Volume 2, Number 6, 2000, pp. 423-432(10), Elsevier Science. Abstract available at <http://www.ingentaconnect.com/content/els/13667017>, subscription required to access paper

Suggests framework for design of local groundwater management institutions based on participatory institutions through a case study of community based groundwater management.

Safe Drinking Water and its Acquisition: Rural Women's Participation in Water Management in Maharashtra, India

by Devasia L., International Journal of Water Resources Development, Volume 14, Number 4, 1 December 1998, pp. 537-546(10), Routledge. Abstract available at

<http://www.ingentaconnect.com/content/routledg/cijw>, subscription required to access paper

Studies villages in the arid region of Vidarbha in Maharashtra highlighting women's participation in community management efforts to meet the problem of adequate and safe drinking water.

Solution Exchange Responses in Full

Kalika Mohapatra, UNDP, Orissa

Orissa "Pani Panchayat " is managing water perfectly at community level. You can see the programme in Western Orissa's watershed management programme where you will find the various roles played by the community and local self government in managing water and preparing community based drought management plans.

Community members decide the sources of water, type of water sources are required for their village and agricultural activities, where they want to have various water shed structure and who are the users and how others will get benefit from this watershed programme. Even they have also developed some alternate agricultural practice by growing onion, sweet potato etc, alternate livelihood options and tried to help vulnerable groups.

B.R.Sharma, IWMI, New Delhi

I have come across a special project in Andhra Pradesh which deals with this issue. Project is named as "Andhra Pradesh Farmer Managed Groundwater Systems Project" which is operational in six water starved districts of Andhra Pradesh. Further details may be found at www.apfamgs.org.

Dinesh Kumar, IWMI, Anand

I think you are in for an unpleasant surprise!!! There have been talks about communities managing groundwater; practicing conjunctive use etc. for the past one decade or so. There are also a lot of anecdotal evidences, perhaps more than required, about villagers observing certain restraints in

pumping groundwater or drilling wells around community drinking water wells! But, in actual practice, there is hardly anything to cite of community-management of groundwater. This is quite understandable. After all, why should one village decide to observe restraints on the use of water from a "pool" which is going to be shared by hundreds of villagers?

The only case I know about is the Ozhar experiment in Maharashtra by SOPECCOM (you can contact Joy). I think in Ozhar, they (WUAs) have been able to fix entitlements for the water brought through canals and stored in local reservoirs, and the water pumped from the aquifers (if I remember correctly). Here, the import of exogenous water is the leverage.

There can't be any serious thinking about community management, and other institutional interventions (either from government or NGOs) unless and until we put a break to "water harvesting" campaign, which is being viewed as a panacea.

[Shashidharan Enarth](#), Development Support Centre, Ahemdabad

I agree with your observation (certainly unpleasant) about the dismal scenario of community driven groundwater management in India. It is in fact a text book case of poor governance of CPRs, perhaps tougher case than other CPRs due to complex nature of GW resource and its high economic value. That makes it hotter to deal with politically. The failure is at all levels -- poor regulatory environment at the macro-level, poor application of available technology for assessment and monitoring the resource at micro and macro level, and absence of any social, cultural or economic institutions (traditional or modern) that can play an effective role of steward at the user level. If it worked in Ozhar, we will have much to examine and understand before lessons can be adopted/adapted for other geographical-political-social setting. Of particular interest will be the mechanism of rule-making that enabled them to assign individual (or collective?) entitlements and enforce it in a sustainable manner (there is a sustainability question here).

Your last sentenced intrigued me! How will it help if we put a brake (I am assuming that is what you meant by "break") on water harvesting campaign? How will a diminishing supply situation help? Are you implying that a pre-empted supply crisis may force us to think of sound demand management?

I would re-phrase it: "water harvesting will perhaps partly mitigate impact of unbridled extraction. It cannot be an answer by itself". What do you say?

[G Misra](#), Directorate of Economics & Statistics, Port Blair

I did hear that Shri Pratap Singh in Rajasthan has done good work in mobilizing the community on water conservation. The community participated and constructed many bodies to check rain water loss and thus ensuring the enhancement of groundwater. Villagers are able to grow many crops which they could not think of growing for a long time.

[Nupur Bose](#), Department of Environment and Water Management, A. N. College, Patna

Ground water management is a complex issue in India, given the country's varied geo-hydrological status, types and quantum of demand for ground water and, most important, water quality. For instance, there are known water deficient areas, as well as newly emerging water surplus areas with contaminated ground water.

The issue of ground water management can be best met through seeking and implementing solutions as per the nature of the problem at local and/or micro-levels.

In our current work, metalloid contamination of ground water is THE issue. The real challenge in our case is mitigation work in a widespread and heavily populated area. Hence, it is felt that whatever the strategy adopted for utilizing and conserving ground water resources, community responses ultimately shape the success in providing long-term solutions to this issue. So steps like planned usage of water and penalties can be implemented after creating awareness and motivation among the affected villagers, and then involving them in solution measures that have been arrived at after making cost-benefit analysis of the same. Although there is no single solution to the universal problem of fresh water availability, it would be equally simplistic to assume that solutions are utopian and to give up on the issue.

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Prabhjot Sodhi, UNDP GEF SGP, New Delhi

You remind me of good old days when we were together with Keith Virgo/ Steve and GVT friends....

Recently we have undertaken a lift irrigation project in Banikhet with a small NGO called Yog Manav Trust (Shri. Dodeja, Phone no. 9418040000 / 9818031000/01899240670), and the focus under the Small Grants Program has been to work in this project along with the Panchayat.

The communities have made a Pani Panchayat Co-operative where they have initially collected an amount of Rs. 500/- Rs. 400/- (on socio-economic category wise and water use) as a token money to be put in the Society as their share towards the capital cost recovery etc.

The Pani Panchayat Society has been registered after 2 years of informal process of agreeing the common terms and conditions between members. The Community has decided on all aspects of water use; water charges, local maintenance etc. The NGO has provided the communities exposure on management and book-keeping. All the members have formed their management body and allocated "clear roles" for management. (This may all sound easy, but has taken considerable efforts of continuous meetings, local dialogues etc.)

The process facilitation started in the beginning before the scheme was sanctioned by UNDP GEF SGP to the communities. This is a remote, hilly area in Himachal Pradesh near Dalhousie. Links have been made by the NGO with the District Collector; Agriculture University and other institutions to ensure better livelihoods for poor. New areas have been directly brought into high-valued irrigated area. They have made (communities) plans as to how now they can develop better agricultural practices. The focus immediately is not to go for hybrids and heavy fertilizer use, but to maximize the benefits through organic farming. Hope this meets your requirements.

–

Dinesh Kumar, IWMI, Anand

Nice to hear from you after a long silence! Thanks for your wonderful insights on the reasons for "institutional failure". My frustration with water harvesting is because of the nature of regions chosen for the interventions. In most situations where it had been tried, the surface runoff is already over-appropriated and we are operating in "closed basins". Now with intensive water harvesting, we have a situation like "Peter taking Paul's water" or in the recent IWMI parleys, Robbing Yadullah's Water to Irrigate Saeid's Garden.

Whether it is Saurashtra, or Kachchh or North Gujarat or many watersheds in peninsular India, the situation is the same. But I do not think anyone denies the fact that water harvesting has some positive impact in the locality it is tried. The point is that overall it does not help much at the basin level in low and normal rainfall years when you require water badly. Well, there are issues like "at what costs? Local self reliance is posing question mark to regional water solidarity.

The second issue is that with plenty of public money for water harvesting, people do not think of the need for any interventions to improve the efficiency of water use! Forget demand management. Yes, on the last question: if one stop doing water harvesting (where it is not required), the social ingenuity would start surfacing. People would look for ways to reduce water consumption—shifting to high valued and economically more efficient crops. But, I think what is lacking is a presence of strong extension mechanisms (institutions) for promoting efficient water use technologies and water efficient (economically) crops.

Your reactions and those from others are awaited.

—

[Srikanth](#), WaterAid, New Delhi

I agree with Nupur Bose and her concerns of ground water contamination especially where there is surplus water. This triggers the practice of intensive agriculture thereby ground water gets contaminated due indiscriminate use of nitrogenous fertilizer and pesticides. Nitrate contamination is major concern in rural India in our current work and on pesticides we have hardly any data available and as on yet there is no legislation to control excess usage of fertilizer and pesticides. Community awareness should be built on these issues as well as a part of ground water management in the community based initiatives.

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[Shashidharan Enarth](#), Development Support Centre, Ahemdabad

I have been reading with interest your exchange through the network.

I take you point that aquifer recharge using surface run-off is not a "one-solution-fits-everywhere" case. In fact no intervention in augmenting supply can be universally suitable across space and time. Adaptation to local site-specific needs is essential. (on a lighter, philosophical note, nothing in life can be assumed to work all the time, everywhere!!).

Even without completely understanding the technology behind your argument, I will agree that there are many instances where run-off diversion is the wrong thing to do, based on science. It may be the right thing to do socially and politically because that is the only feasible option available to the community. If Peter's action deprives water rights of Paul, there is very little Peter is going to do to alleviate the Paul's anguish. There is simply no mechanism that compels Peter to behave. nor are there any incentive for Peter to forego his entitlement. Even the laws governing "interception" of notified rivers or government canals cannot be enforced -- look at the 1000s of engines that pump out water from main canals of Dharoi or rivers without permits? Not that I am championing for permits. Gosh no. What we need is a workable forum where the Peters and Pauls, Rams and Rahims can negotiate in a transparent manner.

Too many things have to happen before things start falling into place. All of them are possible if the first thing is put in place --- a robust institution that ensures transparent, accountable governance. That will provide incentive to water users to behave, and regulators to enforce.

Too much rambling, huh?

[Jasveen Jairath](#), CapnetSA, Hyderabad

I tend to agree with Dineshji. Blind promotions of water harvesting can often - and does in fact - enable the large landowners to appropriate fruits of common effort by pumping out the augmented ground water (GW). This amounts to providing social subsidy to the landed class since large landowners gain more relative to small ones - who get trapped into GW dependence through powered borewells leading to indebtedness etc.

Conservation of water and its benefits are disconnected and not open to any control mechanism that can ensure proportional water security.

Secondly, I also agree that such augmentation of GW actually serves to promote water intensive land-use by users. Witness the increase of rice cultivation and rice mills in Mahabubnagar district of AP after the onset of borewells - that is a straight strategy of private appropriation of a common source.

Thirdly, the above is NOT an argument that we let things be and simply stop water harvesting. Certainly - focus has to shift to reduce monopoly of water - and its conservative USE - as Dinesh ji has rightly pointed out.

Blind water harvesting - reinforces these monopolies in water sector - that are the foundation of water crises.

Water Crises has to be perceived as one of discrimination in access and control - NOT as one of less water.

Water harvesting is a technical response to an implied "less water" as a natural phenomena.

Hype about "less water" is an ideological tool for legitimizing the water augmentation (that may well be necessary) thesis to the EXCLUSION of recognizing that no matter how much MORE water is available - it will always be LESS for those who are socially/politically excluded
More water creates greater opportunities for creating more monopolies - and therefore also generating greater scarcities that justify need for greater augmentation of water - that justifies more investment - that gets co-opted by the powerful - while poor suffer deprivation that serves to LEGITIMIZE continuation of the cycle.

What we need to do is to change the terms of the discourse -
Start with issue of Discriminatory Access/Control Over Water.

Then check out if Water Harvesting strengthens or weakens such socially institutionalized exclusion of majority from access to their water entitlements -and proceed accordingly.
Water harvesting is simply a technique - its impact will depend on its social context.
Like all technologies - their social impacts derive from who uses them for what agenda.

I have not read many earlier contributions to this very lively exchange - so apologies if I repeat.

Many thanks to all who contributed to this query!

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