



Environment

Water Community



Solution Exchange for the Water Community Consolidated Reply

Query: Conflicts Over Drinking Water - Experiences

Compiled by [Nitya Jacob](#), Resource Person and [Sunetra Lala](#), Research Associate

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From [K. J. Joy, Suhas Paranjape and Shruti Vispute](#), Forum for Policy Dialogue on Water Conflicts in India, Pune

Posted 12 November 2008

I work with the Society for Promoting Participative Ecosystem Management (SOPPECOM). We have been part of the Forum for Policy Dialogue on Water Conflicts in India, which is a collaborative initiative of many institutions/organizations – both academic and civil society – and individuals. The Forum has documented conflicts and published these in the form of a book “Water Conflicts in India: A Million Revolts in the Making” (more details about the forum are available at <http://conflicts.indiawaterportal.org>).

One of the important emerging areas of conflict is around drinking water, impacting the lives of both rural and urban population. Though the National Water Policy, 2002 and the various state water policies accord first priority to drinking water amongst various water uses, we have a long way to go to achieve the Millennium Development Goal (MGD) of providing safe and adequate drinking water.

Coupled with this, there are reports and anecdotal information about increasing conflicts around contending water uses including drinking water. Studies and reviews of watershed experiences show the increased availability of water due to watershed development is being used for irrigation, often at the expense of drinking water. On the other hand, sometimes water stored in reservoirs, primarily meant for agriculture is being diverted to cities to meet the increasing urban needs. There have been cases in which industries have been extracting groundwater at the expense of both drinking water and agriculture.

Water quality is another serious issue, especially with polluting industries. Dumping of untreated sewage into streams and water bodies and non-point sources of pollution like agro-chemicals (both fertilisers and pesticides) are also responsible for the declining water quality.

Privatisation of drinking water in the cities and the sector reform programme in rural drinking water supply are said to be the reasons behind hikes in water charges.

Thus, one can say that the conflicts around drinking water are multi-faceted and multi-layered and there is a need to understand them if we have to move towards their resolution.

Keeping the above background and context in mind, we would be grateful if members can share their experiences and insights around the issue of conflicts over drinking water. We invite members to provide experiences on:

- Actual cases of conflicts around drinking water giving details of the location of the conflict, the conflicting parties, issues at stake, present status, etc.
- The reasons for such conflicts and what could have been done to prevent them
- Cases of successful resolution of such conflicts so that they become a learning experience and also part of a wider strategy for resolution

Once the series is complete, we will be compiling them and sharing them with members to study conflict resolution in different contexts.

Responses were received, with thanks, from

1. [Shrikant D. Limaye](#), Ground Water Consultant, Pune
2. [Shrinivas Badiger](#), Institute for Social and Economic Change (ISEC), Bangalore
3. Ashok Kumar, Goundwater Modelling Consultant, New Delhi ([Response 1](#); [Response 2](#))
4. Satya Prakash Mehra, Rajputana Society of Natural History, Rajasthan ([Response 1](#); [Response 2](#); [Response 3](#); [Response 4](#))
5. [Abhishek Mendiratta](#), Consultant, New Delhi
6. [Annie Namala](#), Programme for Inclusion and Equity (PIE), New Delhi
7. [Lata Anantha](#), River Research Centre, Kerala
8. [Ramakrishna Nallathiga](#), Centre for Good Governance, Hyderabad
9. Lak Tewari, India Canada Environment Facility (ICEF), New Delhi ([Response 1](#); [Response 2](#))
10. [Anjal Prakash](#), SaciWATERS, Hyderabad
11. [Arunabha Majumder](#), Jadavpur University, Kolkata
12. [Sam Livingston](#), Development Consultant, Pondicherry
13. [Hemant Kulkarni](#), Council for Scientific and Industrial Research, New Delhi
14. R. Kulasekaran Srinivasan, Centre for Science and Environment, New Delhi ([Response 1](#); [Response 2](#))
15. [Sudhirendar Sharma](#), The Ecological Foundation, New Delhi
16. [Anupam K. Singh](#), Nirma University, Ahmedabad
17. K. J. Joy, Forum for Policy Dialogue on Water Conflicts in India, Pune ([Response 1](#); [Response 2](#))
18. [Shalini Jain](#), SEEDS India, New Delhi
19. [S. V. Vijaya Kumar](#), National Institute of Hydrology, Kakinada
20. Uday Bhawalkar, Bhawalkar Vermitech Private Limited, Pune ([Response 1](#); [Response 2](#))
21. [B. L. Kaul](#), Society for Popularization of Science and Progressive Educational Society, Jammu
22. [Arun Jindal](#), Society for Sustainable Development, Rajasthan
23. [D. K. Manavalan](#), Action for Food Production (AFPRO), New Delhi
24. [Sarita Mehra](#), Rajputana Society of Natural History (RSNH), Rajasthan
25. [Sejuti Sarkar De](#), Society for Natural Resource Management and Community Development (SNRMCD), New Delhi
26. [R. Jagadiswara Rao](#), Sri Venkateswara University, Tirupati, Andhra Pradesh

Further contributions are welcome!

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Summary of Responses

Conflicts over drinking water have extremely convoluted causes, made all the more so by the complex caste system in India. The impact of the usual suspects – overdrawal by farmers, pollution by industry and agriculture, supply to urban centres, large projects and droughts – is exacerbated by the caste system. Women suffer, and those from the lower castes are the most, in the scramble for drinking water, as it is their fate to be water providers for their households.

The main **area of conflict over drinking water** is the rapid growth of urban centres that are sponges for fresh water, said members. These have exhausted, encroached or polluted local water sources and now need water to be piped or channeled from several hundred kilometers away. In the process, villagers or towns near the source are denied their water, while those along the supply route tap into it. Towns and cities discharge over 80% of their sewage and industrial waste untreated back into rivers.

[Mumbai](#), for example, draws water from the Vaitarna and Bhatsa dams about 100 KM away. The pipelines pass through the Vasai-Virar area that get much less water than the city. There have been protests by residents there, and a few died in clashes with the police. Similarly, **Delhi** gets a substantial amount of water from the new Tehri dam, about 300 KM away. Farmers along the canal regularly tap water, and Uttar Pradesh, through which the canal passes, interrupt supply when farmers face an irrigation water shortage.

[Chennai's](#) slum clearance board has converted the city's many lakes, that were both sources of water and reservoirs for rain water, into housing colonies; the city is perpetually short of water and these colonies now flood in the monsoons. The city depends heavily on groundwater, but overexploitation has allowed sea water to intrude and pollute aquifers. The [Veeranam Lake](#) in Chennai used to irrigate 18,000 hectares but now a substantial amount of water is diverted to the city, causing conflicts with the farmers.

The [Khan River](#) flowing by Indore, **Madhya Pradesh**, is so polluted the city now sources its water from the Narmada River, 70 KM away. The Khan River now affects the water supply of downstream Ujjain that sources its water from the distant Gambhir River. The historic [Bhopal Lake](#) in Bhopal, source of 40% of the city's water, is now so polluted that it now has to pipe water from Kolar dam, 40 KM away. These examples demonstrate the cascading effect of urban pollution.

In [Jaipur](#), **Rajasthan**, groundwater has been all but exhausted and the government has plans to source water for the city from Bisalpur dam that already supplies water to Ajmer. Farmers and others protested this, but the government violently suppressed their protests. The state government has another Rs 500 crore plan to supply water from the Chambal River to [Karauli](#), that may affect water availability in the Gharial Wildlife Sanctuary. Nearby, the Panchana dam on the Gambheer River has deprived 350 downstream villages of water.

In these cases, the solution is better sewage treatment, rainwater harvesting and water conservation so cities and towns can meet some of their requirements themselves, and reduce the downstream impact of their activities. The authorities have to take an integrated long-term approach while planning water supply to towns and cities, rather than a piecemeal one.

Water scarcity aggravates caste conflicts, and caste determines access to water, both in normal times and during droughts, said members. Water continues to be one the main grounds for untouchability as the upper castes do not like their water sources to be used by the lower castes and Dalits. In a village near [Bharatpur](#), Rajasthan, the dominant caste deprives those from lower castes of water. In droughts,

the latter have to carry water long distances. In the [Vadali village](#) of Surendranagar district, **Gujarat**, caste differences between the dominant Ahirs and the lower-caste Kolis and Dalits aggravated their water crisis. The Ahirs own many farm wells and in droughts, shift to the farms. The women of the Kolis and Dalits have to depend on the Ahirs for drinking water, exposing them to sexual harassment. In addition, when the authorities declared the village scarcity-affected, the state water board starts supplying water through tankers, fed by the wells owned by Ahirs. The NGO working in the village resolved this by selecting a site for a checkdam to recharge the aquifer, and a well to provide drinking water that can be used by the Kolis and Dalits.

In [Patan](#), Gujarat, upper caste men sexually exploit Dalit women when they come to ask for a few pitchers of drinking water, as the groundwater is brackish. In [Nawabganj](#), Unnao, Uttar Pradesh, people from the dominant caste dug a tube well, and used free power supplied to farmers, to draw drinking water from this. They denied access to members from the lower castes who suffer from a variety of water-borne diseases. In many cases, the state and other agencies working on water supply have worked around caste factors by providing separate water sources for Dalits and lower-castes.

The third cause of conflict over drinking water, noted members is industrial pollution. It is well-known that industrial units dump their toxic waste in abandoned tube wells or bury it underground. Several such instances have come to light across India, and in all of them, groundwater has been severely polluted, depriving people in a large surrounding area of drinking water.

The most well-known is perhaps the [Union Carbide](#) factory in Bhopal where Greenpeace has found stored chemicals have leached into the soil, poisoning the groundwater. Poor people living near the factory, who depend on handpumps for drinking water, are the worst-affected. In Kerala, the [Nittin Gelatin Company](#) in the Chalakuddy river basin has a long-running conflict with local people over health, drinking water and pollution of the river and their fields. People have demanded safe drinking water from the company at successive meetings, but the matter remains unresolved. In [Paschimi Medinipur](#), West Bengal, a committee found that a factory set up to manufacture naphthalene balls lacked pollution control equipment. At the urging of local people, the committee excavated certain places around the factory and found it had buried toxic waste in gunny bags. This has polluted water in 6 tubewells in a 1 KM radius. The committee recommended the factory take remedial measures but the conflict between it and the villagers continues to simmer. In [Pali](#), Rajasthan, textile dyeing units have polluted groundwater by injecting effluents into aquifers but the local people now have taken them on as they are able to test groundwater for pollution.

Several fertiliser factories around [Udaipur](#), Rajasthan, use the rich local deposits of rock phosphate. They use sulphuric acid to process raw material, leading to severe air and land pollution. Water in the wells used to supply drinking water has turned brown and smells foul, and there is a high incidence of disease among both people and animals. However, no resolution is in sight as it has become a matter of livelihood for some people.

In all the causes of conflicts, members said women, especially from the poor sections and lower castes, are the worst-affected as they have to provide water household purposes. If they depend on upper castes for water, they risk being raped. Sometimes, they have to walk long distances in the dark to fetch water. Both the government and communities have to take cognizance of these issues and work out solutions to end conflicts over drinking water. Broadly, members felt rainwater harvesting and conservation, and efficient effluent treatment systems, could provide long-term solutions to some of the conflicts over drinking water.

Comparative Experiences

Gujarat

Caste Issues Pose as an Obstacle in Providing Drinking Water Sources, Vadali village, Surendranagar District (from [Anjal Prakash](#), *SaciWATERS*, Hyderabad)

Problems associated with water scarcity in the drought-stricken village were aggravated by caste differences. In order to ensure drinking water security, two check dams were constructed on the two small rivulets that flow through the village. However, in 2004, when there was an initiative to construct drinking water wells, farmers belong to the dominant caste opposed this because they felt it would affect the irrigation water availability. The situation remains unchanged.

Dalit Women Exploited For Accessing Drinking Water, Patan (from [Shalini Jain](#), *SEEDS India*, New Delhi)

The groundwater around the village was brackish, and forcing people to seek drinking water elsewhere. Dalit women had to beg landlords for a few pitchers of drinking water. During droughts, they were subjected to sexual exploitation by thakurs and landlords in return for access to water for their families. A recent study showed that the situation has not changed and women still have to walk up to 4 miles in the dark to access drinking water. Read [more](#)

Kerala

Communities Unite Against Water Pollution Caused by Industries, Chalakudy Basin (from [Lata Anantha](#), *River Research Centre*, Kerala)

There has been a 34 year old conflict between the Nitta Gelatin Company, which manufactures Ossein in the downstream areas of Chalakudy river basin, and the communities living in the surrounding areas. The conflict is over drinking water issues and pollution of the surrounding wells. At present, the communities have again come together after a gap in a long-standing agitation, to demand zero pollution from the company to ensure safe drinking water. The conflict is yet to be resolved.

Madhya Pradesh

Water Pollution Due to Leakage Causes Conflicts, Bhopal (from [Abhishek Mendiratta](#), *Consultant*, New Delhi)

An estimated 3,800 people died in December 1984 after a major toxic gas leak at the Union Carbide plant. A Greenpeace study discovered widespread water contamination in the area following the disaster. Since then there have been many more deaths as a result of diseases caused by the incident. A lawsuit regarding death and illness as a result of polluted water dates back to 1999, and people still continue to suffer from water related illnesses. Read [more](#).

From R. Kulasekaran Srinivasan, *Centre for Science and Environment*, New Delhi; [response 1](#)

Water Withdrawal from the Narmada Poses Potential Conflicts, Bhopal

The Bhopal Lake built by the Bhuj kings is a massive water harvesting structure, which still accounts for 40% of the city water supply. But the lake is being polluted by untreated sewage flowing from old Bhopal city. Now the city receives water from the Kolar dam, which is 40 km away from the city. Soon it will have to start drawing water from the Narmada River, which is predicted to result in conflicts with communities in the Narmada basin.

Water Conflicts Arise Due to Sharing of Water Across Cities, Indore

The Khan River has been polluted and the city now receives water from the Narmada River, which is 70 km away. The water is produced at the cost of Rs 10 per kl, but sold at a subsidized cost. The Khan River polluted by Indore city pollutes the Shipra river in turn, which is the drinking water source for Ujjain city, and located downstream of Indore. Hence Ujjain now draws water from the Gambir River and this has led to conflicts between these cities.

Maharashtra

Protests Ensure More Water is Supplied in Vasai/Virar and Mira/Bhayander, Mumbai (from [Ramakrishna Nallathiga](#), *Centre for Good Governance, Hyderabad*)

Mumbai draws water from reservoirs with pipelines passing through the Vasai-Virar corridor and the fringe areas of Mira-Bhayander, despite the fact that the water supply in Vasai/Virar and Mira/Bhayander is less than in Mumbai. This deprivation has angered the residents, who have held numerous protests. As a result, recently some attention is now being paid to the Vasai-Virar water supply project to ensure enough water is made available to local communities in the area. Read [more](#).

Rajasthan

Employment in Manufacturing Units Becomes a Priority Over Safe Drinking Water, Udaipur (from [Satya Prakash Mehra](#), *Rajputana Society of Natural History (RSNH), Rajasthan*; [response 3](#))

In 1998, rock phosphate manufacturing units disposed off acidic effluents on land, resulting in water pollution. The water in the borewells used to supply drinking water, but had turned brown with a smell foul, and there were high incidences of disease among people and animals. A complaint was made to the Pollution Control Board. In the 1990s it was observed by RSNH that the residents no longer chose to raise their voice against this, since employment in these units had become a priority. Read [more](#).

Caste Discriminations Prevent Villagers from Drawing Water from Borewells, Bharatpur (from [Satya Prakash Mehra](#), *Rajputana Society of Natural History, Rajasthan*; [response 4](#))

Murwara Panchayat in Bharatpur is an area with a dominant deprived community population, which lacks drinking water supply. During droughts, members from the deprived community must carry water over long distances, because they are not permitted to use the bore well in the village. This is because a temple is located near the well, which people from lower castes are not allowed to visit. Recently, an NGO has started working in this area to address this issue of caste-based discrimination.

Protests Over Drinking Water Deprivation Leads to Deaths, Jaipur (from [R. Kulasekaran Srinivasan](#), *Centre for Science and Environment, New Delhi*; [response 1](#))

In 2003, the city's groundwater reserves were totally exploited. Now the city, with ADB funding, is planning to draw water from the Bisalpur dam at the cost of Rs 1,000 crore. The dam is 75 km from the city. The Bisalpur dam already provides water to Ajmer and other towns. As a result the farmers around the dam are being deprived of water. As a result, farmers protested the decision and some in Tonk Village were killed in conflicts with police. Read [more](#).

Communities Empowered to Test Water Quality, Pali (from [R. Kulasekaran Srinivasan](#), *Centre for Science and Environment, New Delhi*; [response 2](#))

Farmers were deprived of water for irrigation due to pollution of rivers by CETP effluents, however they did not have water pollution data to take it up the issue with the government. With the training and technical guidance from Centre for Science and Environment, the community members in Pali village have been able to monitor the water quality in the area. They now feel empowered to take up the issue with the government. Read [more](#)

Withdrawal of Water from the Chambal Results Into Conflicts Over Water Availability for a Wildlife Sanctuary, Karauli (from [Arun Jindal](#), *Society for Sustainable Development, Rajasthan*)

There has been a reduction in the availability of drinking water in Karauli due to the construction of the Panchana dam on the Bhadrawati River. But with the river drying up, a Rs 500 crore scheme has been initiated to draw water from the Chambal River, which is located close to the Gharial Wildlife Sanctuary. Recently, the Bhadrawati Bachao Sangharsh Samiti has been demanding the government guarantee the withdrawal of water does not affect the sanctuary. The issue is yet to be resolved.

Uttar Pradesh

Forest Protection Committees Deprive Disadvantaged Community Members from Accessing Tube Wells, Unnao (from [Sejuti Sarkar De](#), *Society for Natural Resource Management and Community Development (SNRMCD)*, New Delhi)

The Forest Protection Committee (FPC) members in a villager near Nawabganj at Unnao, who belonged to the dominant castes, used the free power supplied to farmers to dig a tube well near their houses. People belonging to lower castes were not allowed to draw water from that tube well. As a result, many from this community suffer from a variety of water-borne diseases. When reported, the Panchayat and Forest Department showed reluctance in intervening in the matter, leaving the conflict unresolved.

Tamil Nadu

From *R. Kulasekaran Srinivasan, Centre for Science and Environment, New Delhi*; [response 1](#)

Sea Water Intrudes Into Aquifers as a Result of Over Extraction, Chennai

When the Chennai Metro Water Board found that their well fields were drying up in the Korataliyar basin, they entered into an agreement with farmers and transported water to the city through tankers. The environmental impact of this has been alarming. The entire basin is now dry and sea water has intruded up to 18 km north of Chennai in the Minjur aquifer. This has led to a conflict of interest between Chennai and the Korataliyar basin.

Drawing Water From the Veeranam Lake Leads to Conflicting Water Usage, Chennai

Water from the Veeranam Lake used to irrigate 18,000 hectares of paddy crop. Now it is being diverted to Chennai to meet the city's water needs. Farmers objected and filed a case in the court, which prevented the government from drawing more water for the Veeranam extension project, which was designed based on the assumption that water from the Cauvery will flow into the Veeranam Lake. Now this has led to conflict over water sharing between Tamil Nadu and Karnataka.

West Bengal

Water Pollution due to Factories Causes Water Conflicts, Debra Village, Paschim Medinipur District (from [Arunabha Majumder](#), *Jadavpur University, Kolkata*)

In 1989, a factory was set up in the village to manufacture Naphthalene balls. There was no pollution control device for liquid wastes produced by the factory, so area residents complained to the Pollution Control Board that the water had a foul smell and that they were experiencing intestinal and urinary tract disorders as a result of drinking groundwater. Despite the community's efforts, the conflict remained unresolved for the residents and the factory. Read [more](#)

Related Resources

Recommended Documentation

United Nations Educational, Scientific and Cultural Organisation (UNESCO) Project on Internationally Shared Aquifer Resource Management (from [Shrikant D. Limaye](#), *Ground Water Consultant, Pune*)

Report; **United Nations Educational, Scientific and Cultural Organisation (UNESCO)**; Paris; 2007
Available at http://www.inweb.gr/workshops/UNESCO_ISARM/UNESCO_ISARM.pdf (PDF, Size: 678 KB)

Studies transboundary aquifer systems which are a source of freshwater for many countries and a source of drinking water as well, including transboundary water conflicts

National Water Policy 2002 (from [Shrinivas Badiger](#), Institute for Social and Economic Change (ISEC), Bangalore)

Policy Paper; Ministry of Water Resources; New Delhi; 2002

Available at <http://wrmin.nic.in/writereaddata/linkimages/nwp20025617515534.pdf> (PDF, Size: 56 KB)

Provides details on the institutional mechanisms required for managing water resources, including drinking water supplies, which can help to mitigate water conflicts as well

Water (from [Annie Namala](#), Programme for Inclusion and Equity (PIE), New Delhi)

Documentary; Programme for Inclusion and Equity; New Delhi; 1980

To avail of a copy contact Annie Namala at annie.namala@gmail.com

Documents water conflicts in Andhra Pradesh, where the government had installed water pumps and the conflict situation arising out the deprivation of the dalits from using the same

India Infrastructure Report 2008-Business Models of the Future (from [Ramakrishna Nallathiga](#), Centre for Good Governance, Hyderabad)

Report; by Anupam Rastogi, Prem Kalra and Ajay Pandey; 3iNetwork; New Delhi; 2008

Available at http://3inetwork.org/reports/IIR2008/IIR_2008.html

Discusses the PPP growth models used to develop urban infrastructure and reveals how water supply in areas close to Mumbai are much less than in Mumbai, which can lead to conflicts

Thakur Ka Kuan (from Lak Tewari, India Canada Environment Facility (ICEF), New Delhi; [response 1](#))

Short Story; by Munshi Premchand; Scribd; USA

Available at <http://www.scribd.com/doc/6309625/premchand11stories>

Short story, which discusses how a dalit boy was deprived of drawing water from a well, which was owned by a rich landowner resulting in a conflict

Contending Water Uses-Social Undercurrents in a Water-Scarce Village (from [Anjal Prakash](#), SaciWATERS, Hyderabad)

Article; by Anjal Prakash and R. K. Sama; SaciWATERS; Economic and Political Weekly; New Delhi; and India Water Portal; February 2006

Available at http://www.indiawaterportal.org/data/sac/kstudy/conflicts_vadali.pdf (PDF, Size: 15.7 KB)

Discusses the links between water conflicts and social and economic hierarchies and how the issue of water inequity must be tackled through policy and advocacy measures

Urban Water Consumption in Ahmedabad (from [Anupam K. Singh](#), Nirma University, Ahmedabad)

Report; by Anupam Singh; Nirma University; Ahmedabad; December 2008

To avail of a copy contact Anupam Singh at anupam.singh@gmx.net

Gives the results of an examination of the primary water delivery and usage in Ahmedabad, and notes that water conflicts arise when drinking water is used for other purposes, i.e. gardening

From [Shalini Jain](#), SEEDS India, New Delhi

Landlords Exploit the Drought-hit Dalit Women-The Silence of the Lambs

Article; by Anosh Malekar and Patan; Dr. B. R. Ambedkar and His People-A Dalit-Bahujan Media; India; 2000

Available at <http://www.ambedkar.org/News/hl/Landlords%20exploit.htm>

Describes how dalit women were being deprived from water resource usage in drought-hit areas by rich landlords and the resulting in water conflicts

Women and Water

Article; by Asha Krishnakumar; Frontline; Chennai; 10 October 2003

Available at <http://www.hinduonnet.com/fline/fl2020/stories/20031010001107700.htm>

Describes how water conflicts have resulted from the National Water Policy depriving women of any role in the planning and implementation of water programmes

Bhopal Disaster (from from [Abhishek Mendiratta](#), Consultant, New Delhi)

Article; Wikipedia

Available at http://en.wikipedia.org/wiki/Bhopal_disaster

Describes the Union Carbide leakage of toxic gases, which killed several people and subsequently also lead to groundwater pollution

Dying for Water (from R. Kulasekaran Srinivasan, Centre for Science and Environment, New Delhi; [response 1](#))

Article; by T.K. Rajalakshmi; Frontline; Chennai; July 2005

Available at <http://www.hinduonnet.com/fline/fl2214/stories/20050715002204600.htm>

Describes the police firing on farmers agitating in Tonk district, Rajasthan, over conflicts over irrigation water

Community Water Pollution Monitoring Programme in Pali (from R. Kulasekaran Srinivasan, Centre for Science and Environment, New Delhi; [response 2](#))

Report; by R. Kulasekaran Srinivasan; Centre for Science and Environment; New Delhi; September 2008

Available at <http://www.solutionexchange-un.net.in/environment/cr/res-12110801.pdf> (PDF, Size: 309 KB)

Describes the results of the water quality testing done by community members in Pali, where there was a conflict as a result of industries polluting the local water sources

2.17 Lakh Villages Lack Potable Water, Government Admits to Supreme Court (from K. J. Joy, Forum for Policy Dialogue on Water Conflicts in India, Pune; [response 2](#))

Article; by Dhananjay Mahapatra; Times of India; New Delhi; November 2008

Available at

http://timesofindia.indiatimes.com/India/217L_villages_lack_potable_water_govt_admits_to_SC/rssarticle/show/3730057.cms

Discusses conflicts over drinking water arising as a result of water pollution, pointing out that 31,306 villages in India are affected by high concentrations levels of fluoride in drinking water

Conservation and Restoration of Lakes (from [Arun Jindal](#), Society for Sustainable Development, Rajasthan)

Article; by Arun Jindal and Juned; Society for Sustainable Development; National Institute of Hydrology; Roorkee; October 2008

To avail of a copy contact Arun Jindal at jindal1965@gmail.com

Discusses how investment in water schemes without factoring in the ecological study of the water source can lead to water conflicts

Eco-Logical Water Treatment and Sanitation using BIOSANITIZER Ecotechnology (from Uday Bhawalkar, Bhawalkar Ecological Research Institute, Pune, [response 2](#))

Article; by Uday S. Bhawalkar and Sarita U. Bhawalkar; Bhawalkar Ecological Research Institute; SACOSAN Conference; New Delhi; November 2008

Available at <http://www.solutionexchange-un.net.in/environment/cr/res-12110802.doc> (DOC, Size: 419 KB)

Notes how pollution of water sources, by industries and from other sources is a major area of conflict and that BIOSANITIZERS can be used to mitigate pollution and deal with water conflicts

Sand Dams (from [R. Jagadiswara Rao](#), Sri Venkateswara University, Tirupati, Andhra Pradesh)

Photograph; by R. Jagadiswara Rao; Sri Venkateswara University; India WaterPortal; New Delhi; 2008
Available at <http://www.indiawaterportal.org/blog/wp-content/uploads/2008/01/sanddam.jpg> (JPG, Size: 30.7 KB)

Picture of a sand dam, which can be used to augment groundwater and can be used to resolve conflicts over water arising as a result of groundwater unavailability in water scarce areas

Recommended Organizations and Programmes

Central Ground Water Authority, New Delhi (from Ashok Kumar, Goundwater Modelling Consultant, New Delhi; [response 1](#))

A-2, W-3, Curzon Road Barracks, Kasturba Gandhi Marg, New Delhi 110001; Tel: 91-11-23385620; Fax: 91-11-23388310; cgwb@vsnl.com; http://www.cgwber.nic.in/cgwa_profile.htm

Has initiated regulations regarding the development and utilization of groundwater resources in India to ensure equitable access to drinking water and avoid conflicts

United Nations Children's Fund, New Delhi (from [Annie Namala](#), Programme for Inclusion and Equity (PIE), New Delhi)

73 Lodhi Estate, New Delhi 110003; Tel: 91-11-24690401; Fax: 91-11-24627521; newdelhi@unicef.org; <http://www.unicef.org/wes/>

Worldwide, UNICEF works to improve drinking water supplies facilities in schools and communities, which helps to address issues of conflicts over access to water

India Canada Environment Facility, New Delhi (from Lak Tewari; [response 1](#))

Sanrakshan Bhawan, Second Floor, 10, Bhikaji Cama Place, New Delhi 110066; Tel: 91-11-2619-0318; Fax: 91-11-2618-9631; msatya@icefindia.org; <http://www.icefindia.org/subprojects.htm>; Contact Lak Tewari; Senior Project Officer; Tel: 91-11-26190306; laktewari@gmail.com

Undertakes environmental projects in the water and energy sectors and has implemented integrated watershed management projects to ensure equitable access to drinking water

From [Anjal Prakash](#), SaciWATERs, Hyderabad

Water and Sanitation Management Organisation (WASMO), Gandhinagar

3rd Floor, Jalseva Bhavan, Sector 10-A, Gandhinagar 382010 Gujarat; Tel: 91-79-23247170; Fax: 91-79-23247485; wasmow@wasmow.org; http://www.wasmow.org/cms.aspx?content_id=15

Working on construction and maintenance of village-level water supply infrastructure, to help address problems with water conflicts in Gujarat

Gujarat Water Supply and Sewerage Board (GWSSB), Gandhinagar

Jal Seva Bhavan, Opposite Air Force Station, Sector-10A, Gandhinagar 382010 Gujarat; Tel: 91-79-23222263; Fax: 91-79-23225979; jalseva@gujarat.gov.in; <http://www.gwssb.org/objective.htm>

Ensures sustainable drinking water supply and sanitation services in the rural areas of Gujarat, whereby conflict issues can be mitigated

Aga Khan Rural Support Programme, India (AKRSP), Ahmedabad

2nd floor, Choice Building, Swastik Char Rasta, Ahmedabad 380051 Gujarat; Tel: 91-79-6427729; akrsp@icenet.net; <http://www.akdn.org/akf>; Contact Apoorva Ozva; Tel: 91-79-6733384; apoorva@akrsp.org

Works to enable the empowerment of rural communities, particularly the underprivileged and women, by providing drinking water facilities in an effort to address conflict

West Bengal Pollution Control Board (WBPCB), Kolkata (from [Arunabha Majumder](#), Jadavpur University, Kolkata)

Paribesh Bhavan, 10A, Block-L.A., Sector III, Salt Lake City, Kolkata 700098 West Bengal; Tel: 91-33-3359088; Fax: 91-33-3358073; wbpccnet@wbpcb.gov.in;
http://www.wbpcb.gov.in/html/activities_link.shtml

Statutory authority entrusted with implementation of environmental laws and rules in West Bengal, including those related to drinking water

Public Health and Engineering Department (PHED), Jaipur (from Ashok Kumar, Groundwater Modelling Consultant, New Delhi; [response 2](#))

Jal Bhawan 2, Civil Lines, Jaipur 30200 Rajasthan; Tel: 91-141-2227622; j_secy@nic.in;
<http://rajwater.gov.in/introduction.htm>

In-charge of supplying adequate drinking water in the state to ensure equitable access to water, and to avoid drinking water conflicts

Society For Promotion of Wastelands Development (SPWD), New Delhi (from [Arun Jindal](#), Society for Sustainable Development, Rajasthan)

14A Vishnu Digamber Marg, (Rouse Avenue Lane), New Delhi 110002; Tel: 91-11-23236440; spwd_delhi@yahoo.com; <http://www.spwdindia.org/water.htm>

Working to rejuvenate traditional water harvesting systems and create new systems to ensure sustainable use of water for drinking and agricultural practices

Action for Food Production (AFPRO), New Delhi (from [D. K. Manavalan](#))

25/1-A Pankha Road, D-Block, Janakpuri, New Delhi 110058; Tel: 91-11-28525452; Fax: 91-11-28520343
afprodel@afpro.org; <http://www.afpro.org/services.htm>; Contact D. K. Manavalan; Executive Director;
Tel: 91-11-28525412

Has been supporting community-based water management practices, which has helped to resolve conflicts based on availability of drinking water

Joint Forest Management, Ministry of Environment and Forests, New Delhi (from [Sejuti Sarkar De](#), Society for Natural Resource Management and Community Development (SNRMCD), New Delhi)

Paryawaran Bhawan CGO Complex, Lodi Road, New Delhi 110003; Tel: 91-11-24361669; envisect@nic.in; <http://envfor.nic.in/divisions/forprt/jfm/html/joint.htm>

Under this programme soil and groundwater conservation is carried out using a participatory approach, which has helped to avert water conflicts

Rajasthan Pollution Control Board (from Satya Prakash Mehra, Rajputana Society of Natural History, Rajasthan; [response 3](#))

1-42, Gandhi Nagar, Jaipur; Tel: 91-141-2709980; chairperson@rpcb.nic.in;
<http://rpcb.nic.in/Aboutus1.htm>

Statutory authority entrusted with implementation of environmental laws and rules in Rajasthan, including those related to drinking water

Recommended Portals and Information Bases

Waste to Health, Bhawalkar Vermitech Private Limited, Pune (from Uday Bhawalkar, Bhawalkar Vermitech Private Limited, Pune; [response 1](#))

<http://www.ecoguru.org>; Contact Uday Bhawalkar; Director; Tel: 91-20-24226916; bhawalkar@datatone.in;

Provides information on how lakes, streams, rivers and other drinking water sources can be purified by using BIOSANITIZERS

Related Consolidated Replies

Water Management Conflicts Between Communities and External Actors, from Prema Gera, United Nations Development Programme, New Delhi. Water Community, Solution Exchange, India, Issued 18 December 2005

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-global-18120501.htm>

Showcases the management of water conflicts (rural-urban, inter-sectoral, policy triggered) between communities and external actors

Relevance of Public Interest Litigations for Conflict Resolution in Water Sector, from Arati Davis, Svaraj, Bangalore. Water Community, Solution Exchange, India, Issued 14 September 2006.

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-14090601.htm>

Provides examples of PILs which have resulted in tangible benefits; experiences on the use of PIL for resolving water related conflicts and key learnings that have emerged

Flood Induced Water Conflicts, from K. J. Joy, Suhas Paranjape and Shruti Vispute, Forum for Policy Dialogue on Water Conflicts in India, Pune. Water and Disaster Management Communities, Solution Exchange, India, Issued 30 September 2008

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-drm-16090801.pdf> (PDF, Size: 162 KB)

In the context of the current floods in Bihar, the query assessed the conflicts, stakeholders and resolution mechanisms

Responses in Full

Shrikant D. Limaye, Ground Water Consultant, Pune

K. J. Joy of SOPPECOM, Pune has opened an interesting topic.

1) The problem could be viewed as a conflict of interest between surface water engineers and ground water people (hydrogeologists & NGOs promoting water harvesting.) From any rainfall event, the surface water engineers expect a certain amount of runoff to reach the reservoir behind a major dam, constructed for irrigational and/or drinking water supply. However, if the villages in the catchment area adopt rainwater harvesting and promote recharge to groundwater, the runoff reaching the reservoir at the dam is much less.

2) There is an argument that although the surface runoff is reduced, the delayed contribution from ground water runoff towards the reservoir makes up the deficiency. Thus, the hydrograph of the stream/river running into the reservoir is changed from a "high peak, short time-base hydrograph" to a "subdued peak, broad time-base hydrograph". If the area under the curve is the same (meaning that the runoff volume is the same), there should not be a reason for conflict, but often this is not so.

3) This is because after rain water harvesting, the villagers in the catchment area do not just solve their drinking water problem, they also resort to increased irrigation i.e., increased pumping of ground water for winter and summer crops. Thus, there have been cases where the water harvesting structures like small tanks and stream bunds were destroyed by surface water engineers to protect the water supply for downstream cities and for canal supported agriculture.

4) In other words, this is an upstream/downstream conflict, which should be resolved by bringing the stakeholders on a common platform and plan an IWRM (Integrated water resources management) taking river basin as a unit. This is easier said than done. The problems are as follows:

a) Who should do this? A legally constituted authority or just a consortium of stakeholders through informal discussions & social pressures?

b) What is the extent of the river basin? For the Krishna river, should it be from Mahabaleshwar to Vijayawada? What about inter-state allocations? Or should it be a tributary basin like that of Bhima river or only the Upper-Bhima? (then what about lower-Bhima?) Or smaller basin like Neera or still smaller like Gunjawani or a small stream joining Gunjawani? How do you address upstream-downstream issues, even at the smallest scale between two villages.

c) Farmers want use as much surface water or ground water as available for irrigation. But this is a consumptive use because 75% of the irrigation water is actually used by plants. Ever growing cities need more drinking water supply at a reasonable price; industries need water but are reluctant to spend on wastewater treatment, reuse or recirculation; but city and industrial uses are essentially NOT consumptive. They just convert good quality water into bad quality wastewater. It is difficult to reconcile the competitive claims of these 3 sectors on the basis of "Contribution to GDP per Cubic Meter of water used", as this factor is maximum for industries and minimum for agriculture in most cases.

These are just some problems in practicing IWRM. There are many more at the field level. Even at the micro-scale, there have been cases in which the water harvesting bunds constructed in one village were broken at night by villagers from a downstream village. This is the story of management of surface water; a visible resource; and UNESCO has a study group dealing with management of Internationally Shared (Trans-boundary) Ground Water Resources!

[Shrinivas Badiger](#), Institute for Social and Economic Change (ISEC), Bangalore

Conflicts around drinking water as noted by [K.J. Joy and Suhas Paranjape](#) (SOPPECOM) are complicated by competing sectors. While there are examples of drinking water scarcity worsening in areas where watershed development is implemented, new sources sought for drinking water every 3-4 years is providing the sugarcoat relief temporarily. These conflicts are generic even in areas where watershed development has not directly triggered agriculture intensification.

In the Malaprabha catchment (a sub-basin of the Krishna river) intensification of agriculture mostly due to perennial cropping systems such as sugarcane, and horticulture is resulting in drastic changes to hydrologic flow regimes limiting access to domestic water from both surface and ground water sources. Extensive promotion of sugarcane in the region by sugarcane companies through providing credit and assured buy-back arrangements, has pushed even conventionally rainfed small and marginal farmers to dig deep borewells. Though a recent drop in the market for sugarcane has cautioned some farmers, the overall trend seems to be more or less on the rise.

More than half the cultivated area in the catchment receives some form of irrigation and is on the increase, while domestic water supply situation is getting worse every year. As an example, the town of Bailhongal which depends primarily on the river lifts for meeting domestic water needs has been facing acute water shortages during summer during the last 10 years.

While system's inadequacies within the town (infrastructure and institutional) have resulted in some form of scarcity and inequity among various sections of the community, reduction in summer flows in the river is forcing the town to temporarily shift to groundwater (deep bore wells) which are also depleting at a rate that will suck out all the water from the aquifer in the next 10-15 years. During drought years, town officials seek legal assistance and implement Section 144 to control withdrawals from the river for sugarcane irrigation. The town council members are often escorted by a convoy of police in their attempts to stop irrigation pumping from river.

A few days later, the situation is back to the same as they succumb to the pressure from the sugarcane growers lobby. The conflict is so imminent that it has turned violent in some years during the past. Both the parties blame each other for their shortages, while the irrigated farmers were unwilling to accept the seriousness of domestic water scarcity in the town and the town council is resorting to tapping more

groundwater and building new barrages across the river without claiming/negotiating their rights to access water (at least) during summer. The solution to the conflict is far from being addressed.

It would be interesting to learn if similar examples of conflict between drinking water users and irrigation have been resolved, where communities have taken some negotiated approaches, while one knows in reality prioritization of drinking water (according to NWP) is difficult to implement in its real sense/cause.

[Ashok Kumar](#), Goundwater Modelling Consultant, New Delhi *(response 1)*

Conflict is the buzzword and everyone is using it. Society cannot survive without conflict.

In India water rights have not been defined for most places, and where they have, they remain vague and contradictory. We may define these clearly through regulation and implement them in their proper spirit. The Central Ground Water Authority (CGWA) has initiated regulations for development and utilization of groundwater. But the majority of state governments are not taking initiatives to enforce or enact model bills. These need very strong political will, but this is lacking in Indian politics.

Any conflict can be managed if we have proper and sufficient data. We need to do water budgeting. Lack of a comprehensive technical database on groundwater availability and its utilization make this difficult. Further we also need to prioritise water uses. But there is framework.

The utilization of groundwater for drinking is a very small fraction compared to the amount used for irrigation. The major depletion in groundwater resources is because of heavy withdrawals of groundwater for irrigation purposes.

Water depletion and its contamination is not a one day process, but a long one. However, as a country we lack a long-term vision. We start working on a problem when it's at a stage where it cannot be reversed. Now we have reached a level where most groundwater aquifers have water quality problems. Can we still remove the contaminants or improve the quality? We have damaged the resources, now can we prevent further deterioration.

The other option is not to do anything and let society resolve this conflict itself without any external intervention. This is the status-quoist approach.

[Satya Prakash Mehra](#), Rajputana Society of Natural History, Rajasthan *(response 1)*

I would like to draw attention on one of the major conflicts of drinking water in the north-eastern region of Rajasthan. Casteism is still prevalent in the Bharatpur region. We found that many villages have different wells and sources of drinking water. On surveying the same we found that these are based on the castes. The deprived communities are still far away from the sources of drinking water in many of the villages. I am citing one of the examples from Murwara Tehsil of Bharatpur district. Here one of the villages has a dominant deprived caste (SC) population. The village has one well in the nearby temple which usually contains water in it but due to caste based divisions, the community does not use the same. Instead the women have to walk 1-2 km to collect drinking water.

This is not the picture of one village but there are many tehsils and villages in this area where caste is the criteria for selecting drinking water sources, including those which are constructed under government schemes.

[Abhishek Mendiratta](#), Consultant, New Delhi

One of the actual cases of conflicts around drinking water is the Bhopal Union Carbide tragedy.

An appeals court in the US has reinstated a case claiming that several thousand people were exposed to polluted drinking water after the Union Carbide disaster in 1984.

An estimated 3,800 people died in December 1984 after a major toxic gas leak at the Union Carbide plant in Bhopal. There have been many more deaths since as a result of disease caused by the incident. The lawsuit regarding death and illness as a result of polluted water following the disaster dates back to 1999, after Greenpeace conducted a study that discovered widespread water contamination in the area.

The current lawsuit was brought on behalf of people who lived or worked near the plant and who claim that they have suffered physical and neurological damage as a result of drinking polluted water. A spokesman for Union Carbide, which paid out US\$ 470 million in compensation in 1989, says that the ruling of the appeals court was based on a procedural issue and that the claims would ultimately be dismissed.

Annie Namala, Programme for Inclusion and Equity (PIE), New Delhi

Around the early 1980s we did a short documentary 'Water' which looked at a village near Tirupathy in Andhra Pradesh on the ordeals of a government installed drinking water pump and the use of the water by the Dalit communities in the area. Over my two decades of work in the rural areas, across India, I see that land and water are two critical resources over which conflicts arise, drinking water included.

The issues for conflict are many. From the economic angle various reasons are recognised easily: both these being extremely important resources for life and livelihood, both being critical for livelihood and poverty reduction, and the limited availability of the resources augment the conflict as well as the concentration of the resources.

In addition, another reason for the conflicts around drinking water is the traditional caste taboos on the use of drinking water. We find that water continues to be one of the prime areas for the practice of untouchability. Thus, sharing water has to break some of the caste mindset and barriers that we have. If one is to observe communities, one realises that dominant communities do not like to have their drinking water sources accessed/polluted by Dalit communities. These taboos have been accommodated in many cases by the state providing separate drinking water sources in different habitations, which normally follow the caste groupings. This by and large avoids trouble.

Last year, in one of the trainings we conducted for UNICEF in Bihar, we had a field trip to audit the provision of infrastructure and services across different caste communities and we found that access to drinking water was much more and better among dominant communities though this is a state provided resource. Blatant discrimination in terms of non-maintenance, non-provision of piped water supply to the Dalit communities are very common. This is not just a lack of provision, but also leads to demands for access by Dalit communities and the resultant conflicts again.

Where the dominant and Dalit communities share water sources, severe cases of violence is reported periodically including naked parading of women, abuse, violence, etc. If one can recall the 1985 violence in Karamchedu village in Andhra Pradesh it was because a Dalit woman objected to the dominant caste washing their buffaloes in their drinking water pond.

Conflicts over the use of water in crisis situations are also reported, particularly in times of disaster.

To address these various measures need to be followed:

- Adequate provision is a critical step

- State provisions should ensure that the marginalised and vulnerable communities have priority in state provisions. Conflicts also arise when the women are in a rush wanting to go for wage labour and are unable to access water for the family
- A critical change in the thinking on water-related taboos perpetuated by caste needs to be promoted by creating debates and dialogue
- Starting the dialogue among children and schools, panchayats and even administration is essential.

In places where there is scarcity of water, various other measures need to be taken in addition.

Lata Anantha, River Research Centre, Kerala

One can approach conflict and conflict resolution from many angles. Take the instance of an ongoing conflict between the communities and the Nitta Gelatin Company manufacturing Ossein in the downstream areas of Chalakudy river basin in Central Kerala. There has been a long standing conflict between the company and the communities living in the surroundings and in the downstream areas over health issues, drinking water issues, pollution of the river and surrounding wells and rice fields.

However, it is an interesting case that can be taken up by the Forum. The issue has a long history of 34 years of pollution of the river by the effluents, violation of laws, people approaching the courts, people demanding safe drinking water to the company in compensation for the water resources polluted, people opposing the company being given jobs, etc.

At present, the communities have again come together after a gap in a long-standing agitation demanding zero pollution from the company and ensuring safe drinking water. On 16 November 2008 there was a convention held near the company where people attended in hundreds and several demands were raised.

The lack of transparency, accountability and credibility of the company towards the people in Kadukutty Gram Panchayath has become the main contentious issues around the conflict.

May I also request members to suggest strategies towards resolving the same? We are assisting the communities by providing the necessary technical and strategic support-base in this process.

Ramakrishna Nallathiga, Centre for Good Governance, Hyderabad

This is an interesting area, where one would like to pose the conflict situations and the causes behind it. However, the conflict resolution mechanisms need to be brought to the focus, which is usually not done other than to concentrate on the theories and cases of leadership or organisation-driven solutions whose long-term sustainability is not well-known.

One latent but occasionally manifesting into severe protests (even violence) type of water conflict is taking place on the fringe or next to the fringe areas of urban settlements. The formal municipal areas that have been zoned/mapped under the municipal plans are taken care of, to some extent, by the municipal governments.

As the mapping and extension of boundaries is done less periodically, that too with a lot of reluctance as it costs the local governments, the fringe areas (or, peri-urban areas) are deprived of the same water supply facilities, which the main/core cities draw upon. Many a times, the water supply facilities pass through these areas and yet no provision is made in the design or operational stage to service the population en route. On the contrary, the city may be dependent upon the goods/services of these people that are cheap/inexpensive.

One well-known latent conflict zone is the Mumbai and its neighbouring Vasai-Virar area. Mumbai draws water from the reservoirs with the pipelines passing through Vasai- Virar corridor and the fringe (adjoining Mumbai boundary) areas of Mira-Bhayander. Yet, the water supply in Vasai/Virar and Mira/Bhayander is much less in these areas when compared to Mumbai if we go by the parameters of levels, duration and service (well documented by Marie Zerah in the India Infrastructure Report 2008).

This deprivation has angered the residents and numerous protests have been made to highlight the issue. There were violent protests in 2000/2002, when the police force was used to quash the protestors and that also led to the death of some of them. Only recently, some attention has been paid through the Vasai-Virar water supply project but even that may prove to be less than adequate given the growth of this region.

[Satya Prakash Mehra](#), Rajputana Society of Natural History, Rajasthan (response 2)

I would like to add another comment from my side. This is based on what I experienced in the urban areas of Rajasthan. As we all know that the rural areas lack drinking and potable water due to many reasons. A lack of government supply through pipelines is one of them, in comparison to urban areas which have a more or less fine network of government water pipelines, which supply drinking water. Here (urban areas) the conflict is due to overuse of drinking water. The water supply is for fixed duration, for one or two or more hours.

During this time period, the house owners withdraw as much water as they can. They use modern means of resources such as water pumps to draw the water from pipelines. No one bothers about equal distribution. Everyone wants to withdraw the maximum amount. In Bharatpur, there are power cuts when water is supplied through pipelines so that no one can start their water pumps to withdraw water.

How can we resolve this issue? The Urban population is considered to be literate, but if that is the case then what should we say about the rural areas where illiteracy is a key factor along with a lack of awareness?

One needs to think over it, I cannot comment on the other urban areas of the country but Rajasthan has many city areas where such problems are prominent.

[Lak Tewari](#), India Canada Environment Facility (ICEF), New Delhi (response 1)

I am surprised that members are still discovering caste barriers to drinking water supply. Please read Munshi Premchand's "Thakur Ka Kuan" which is still very relevant in this context.

As part of my association with India Canada Environment Facility (ICEF), I have a first hand experience of this barrier in Rajasthan, UP, Kerala, Karnataka, Jharkhand, Uttaranchal etc. The barrier is generally on the basis of caste, but it can be discrimination on any other grounds as well. It is a heinous practice and difficult to overcome. On the other hand, I have seen some villages in Rajasthan sharing common wells during droughts.

It will take time and much effort to eradicate this practice, especially since investments in rural water supply have not been very effective at the macro level.

Instead of berating the government efforts (common whipping boy) it would be good to revisit donor agency projects in rural water supply 5 -6 years after project closure, and see why they are not functional. Even handpumps do not function after 6 months. Often simple repairs are not carried out due to community apathy. If we make things work on a sustainable basis such problems will decrease

substantially. Good governance at the village level is the key, not donating pumps and water supply schemes.

Anjal Prakash, SaciWATERS, Hyderabad

SOPPECOM has raised an important issue of conflict around drinking water. During my association with Water and Sanitation Management Organisation (WASMO) in during in 2004-05, I had documented the conflict over drinking water in a village in the drought stricken Vadali village in Surendranagar district, Gujarat. The conditions of water scarcity had been aggravated in the village due to the persisting differences between higher castes, chiefly the ahirs, and those lower in the hierarchy such as the kolis and other dalit castes. The case points towards an important issue of power relations in a feudal society that is linked to social and economic hierarchy. The issue of resource inequity, in this case is intrinsically linked with caste and structural inequalities which an 18 months project cycle had difficulty in dealing with.

In 2005 when the case was documented, the village was facing acute scarcity of drinking water due to persistent drought. The drinking water wells in the village dries up in early March and is recharged only during monsoon, i e, late June or early July. During the time when water is not available in the wells, the village is supplied water through tankers by the Gujarat Water Supply and Sewerage Board (GWSSB). However, tanker supply is resumed only between late April and early May. For the other months, the villagers manage to meet their drinking water needs from farm wells. In the year 2003-04, only 20-30 per cent of the total farm wells had water that was available for around 30 minutes to one hour a day.

In order to ensure drinking water security, GWSSB constructed two check dams on the two small rivulets that flow through the village. However, these measures were not sufficient and provided little relief for the villagers. The village was covered under the community managed development of water supply and sanitation programme of WASMO with active support from Aga Khan Rural Support Programme, India (AKRSP (I)). They collaborated with the village to draw up a village action plan to manage drinking water and sanitation activities. One of the components of the plan was to de-silt the check dams built by GWSSB; these are close to the tubewells and help recharge the aquifer. The plan was to dig a drinking water well near the dam and supply water to the village through a pipeline. According to plan, the check dam was de-silted in early 2004.

The subsequent monsoon filled the check dam and recharged 12 farm wells in the vicinity. The villagers said that the water actually overflowed from the wells, something that they had not seen in the last five years. Looking at the water availability, the farmers around the dam sowed winter crops such as cotton and groundnut and were able to reap benefits. However, in late 2004 while monitoring the progress of the pani samiti, the topic of constructing of a drinking water well in the vicinity of the check dam came up, a plan that was reflected the village action plan document. However, having seen the bountiful harvest that the check dams had enabled, the farmers in the area opposed the drinking water well. They feared that their farm wells would have to share the aquifer and that they would get less water for irrigation. These farmers belong to the dominant ahir caste that has a stronghold over the functioning of the panchayat and pani samiti.

Does drinking water scarcity not affect them all in a similar way? Well not in Vadali and thanks to its social structure. Ahirs dominate the village both economically and socially. They are mostly landed households who own a significant number of farm wells. When the water in the community well (which is the source of drinking water) dries up, landed ahirs do not face much problem. Around 20-30 farm wells continue to hold some water; while it is not sufficient for irrigation, it is enough to meet their drinking water needs. During the scarcity period, these families stay on the farm so that they have enough water for themselves and for their livestock. The drinking water problem affects those who do not have land or farm wells – kolis and dalits.

In the months associated with water scarcity, the women from these families have to depend on the upper caste for drinking water. The dependency makes lower caste women vulnerable and prone to harassment. The ahirs on the other hand also benefit from the tanker programme of GWSSB. As soon as the village is declared scarcity affected, the GWSSB is obliged to make drinking water available through tankers.

The supply of water is done through contractors who fetch water from the ahir farm wells and distribute it in the nearby villages. Most contractors are from the richer classes and benefit from the job. This makes them less interested in drinking water projects that aim to resolve water scarcity since they directly gain from the scarcity situation – both economically and socially. The village dynamics forced AKRSP (I) and WASMO to seek an alternative. An alternative site was selected by the pani samiti that is close to the present drinking water well in the village. De-silting another check dam on the rivulet might help recharge the new location. The selection of a new construction site for the drinking water well minimised the conflict but also revealed the internal dynamics of the community.

However, the case highlights the fact that power structure and social and economic hierarchy go hand in hand and unless the issue of resource inequity is tackled through policy and advocacy means, the real issue will not be solved. Community based programmes under innovative institutions such as WASMO can help speed up the service delivery systems and minimise corruption which was prevalent earlier but bringing about social change within 18 months of a project cycle is too much to expect.

The case was documented in 2005 and since then I have moved from Gujarat. It would be good to know from others (specially from WASMO and AKRSP(I)), whether the conflict is solved and the villagers have sustained water supply after the completion of the project. For more details on the case study, please visit http://www.indiawaterportal.org/data/sac/kstudy/conflicts_vadali.pdf.

Arunabha Majumder, Jadavpur University, Kolkata

I would like to share my experience on the issue of conflicts. I was a member of a committee constituted by the Appellate Authority of WBPCB to look into villager's complaints about groundwater pollution by a factory. The village was at Debra, Paschim Medinipur District, West Bengal. A factory was set up in the area in 1989 to manufacture Napthalene balls. There was no pollution control device for liquid wastes produced by the factory. People of the village complained through mass petition that the water had a foul smell and also they were experiencing certain intestinal and urinary tract disorder as a result of drinking groundwater.

The West Bengal Pollution Control Board (WBPCB) directed the factory to install pollution control devices in 2003. The factory installed an effluent treatment plant in 2004. When we went to the village in 2005, around 200 villagers surrounded us to lodge protest against the factory as they had dumped toxic sludge by burying underground. The villagers started excavation and showed us huge number of gunny bags filled with toxic sludge. Actually the factory buried the sludge in gunny bags for more than 13 years and as a result we found that pollution had travelled more than one kilometre. We also found chemical contamination in 6 tubewells. Groundwater was the only source of drinking water in that village.

We recommended that all corrective measures should be undertaken by the factory. But the conflict remained between the factory and the villagers.

Ashok Kumar, Goundwater Modelling Consultant, New Delhi (response 2)

I slightly differ from [S. P. Mehra](#)'s point of view. In any urban city in India, it is very hard to believe that there is surplus water supply. The Municipality or PHED supply fixed amount of water. Within the urban areas the conflicts are between high income groups and low income groups. The high income groups are

fully equipped with large water storage capacity and high capacity pumps for withdrawing water. This deprives group that do not have high storage capacity and high capacity pump. The amount of water supplied, however, remains fixed.

Further in relation to rural and urban conflicts, I have seen that some areas of rural Rajasthan are well-connected with PHED pipelines. Here, farmers store potable water and sell this through tankers to others. They use the limited freshwater in access for irrigation. This is depleting the limited freshwater. This creates a question mark on the availability of this precious resource in the future.

Sam Livingston, Development Consultant, Pondicherry

I feel that discrimination has to be rooted out. NGOs and Government have to join hands in tackling this conflict situation. As [Annie Namala](#) rightly pointed out – schools and colleges are the right place to address these issues. Caste discrimination needs to be tackled, and groups that are identified by caste should not be given any formal recognition.

Even NGOs working only for certain communities are indirectly encouraging divisions based on caste and encouraging taboos, instead of working for a group. Instead if they could gear up towards working for an area it could solve the problem.

Hemant Kulkarni, Council for Scientific and Industrial Research, New Delhi

I fully agree with [Lak Tewari](#). As Gandhiji once remarked, 'There is enough for everyone to meet their 'needs', but not for their greed'. Ownership and good local governance is essential for the successful implementation of any water project.

Satya Prakash Mehra, Rajputana Society of Natural History, Rajasthan (response 3)

After reading [Arunabha Majumdar](#)'s response, I would like to draw your attention to similar issues I found in the villages of Rajasthan in 1998. Udaipur is famous for rock phosphate mining and many fertilizer units were then located in the remote areas of Udaipur district. Umarada and Khemli villages were the main sites where one could find such units. Sulfuric acid was used in processing the products along with rock phosphates.

Leaving aside the air pollution problems, many of the manufacturing units were disposing the acidic effluents on land which resulted in groundwater pollution. The bore wells which were once used for drinking purposes were out of order as the water was completely polluted. One could easily see the brown coloured water with foul odour. The flouride content in water was also high and diseases in animals as well as humans beings were becoming prominent.

This I experienced when I was doing my PG in Environmental Sciences in 1998. During the time I had complained to the In-charge of the Regional Pollution Control Board, Udaipur. I revisited Udaipur in 2005, and found that now the scene is completely changed. Instead of one or two units in the late 1990s now there are more than ten units. Due to the poor conditions of the local residents no one raises their voice against the units.

Employment for the locals has become a priority over drinking water for the local residents.

R. Kulasekaran Srinivasan, Centre for Science and Environment, New Delhi (response 1)

Conflicts over drinking water arise due to mismanagement of water in urban centres. Urban centres usually have the capacity to get water at any cost and from any distance. For example, Delhi gets its

water from the Tehri dam, which is almost 500 km away and Chennai gets its water from the Veeranam Lake, which is at a distance of 249 km. The conflicts arise when the villagers are deprived of water for irrigation purposes.

For example, in the case of Chennai the Veeranam Lake irrigated 18000 hectares of paddy crop. Now 180 mld of water is being diverted to Chennai to meet the city's water needs. So farmers in that area are deprived of their water. When the government planned to extract more water from the lake farmers objected and filed a case in the court, which prevented the government from drawing water from the lake for the Veeranam extension project. The project was designed based on the assumption that water from the Cauvery will flow into the Veeranam Lake. But due the conflict in water sharing between the states of Tamil Nadu and Karnataka farmers in the Cauvery belt have been deprived of their water. Hence, water is being drawn from the Veeranam Lake to solve the drinking water crisis.

The situation is same in every part of the country. In the case of Jaipur, groundwater has been exploited to such an extent that the Central Ground Water Board in 2003 declared that the groundwater sources will soon be totally depleted in this area. Now the city, with ADB funding, is planning to draw water from the Bisalpur dam at the cost of Rs 1000 crore. The dam is at a distance of 75 km from the city. The Bisalpur dam already provides water to Ajmer and other towns. The farmers here have been deprived of their water sources and when they protested they were killed in police firing in Tonk village.

Similarly in Chennai, when the Chennai metro water board found that their well fields were drying up in the Korataliyar basin, they entered into an agreement with farmers and transported water to the city through tankers. The environmental impact of this has been alarming. The entire basin is now dry and sea water has intruded up to 18 km north of Chennai in the Minjur aquifer.

Cities instead of depriving the rural areas from their water sources need to learn how to manage with the water available to them. All the cities account for 30 to 45 per cent of leakage loss in their pipelines. For example, Delhi loses about 47 per cent of its water in its pipeline. Instead of plugging the gap, it is negotiating with Uttar Pradesh for more water. At the same time Delhi discharges 4000 mld of sewage into the Yamuna river. The Yamuna River is the main drinking water source for Agra, which is downstream. In Agra the Jal Sansthan treats the sewage by pre-chlorination and post-chlorination and supplies the water post treatment to the residents there. Agra is battling with issues of water pollution, and at the same time also plans to obtain water from the Ganga River, which will again entail a lot of expenses.

Our traditional practice has been to harvest rainwater and manage it. However, we have forgotten this practice completely. For example in West Bengal the traditional practice was to store rainwater in lakes called *pukkurs* and water was fetched through shallow open wells. But with the advent of hand pumps and bore wells people started extracting groundwater from deep aquifers, with the resultant arsenic crisis. We need to understand the science behind our traditional practices. In the case of Bhopal the Bhopal Lake built by the Bhuj kings is a massive water harvesting structure, which still accounts for 40 per cent of the city water supply. But the lake is getting polluted by sewage flowing from the old Bhopal city. Now the city receives water from the Kolar dam, which is 40 km away from the city. In the coming days it will draw water from the Narmada River which is again an expensive project.

Similarly, the Musi River and Hussain Sagar Lake near Hyderabad have been polluted and the city now draws water from the Majira and Krishna dam, which is leading to conflicts since farmers are deprived of their water for irrigation purposes.

The cities developed along rivers and lakes have either polluted their water sources or encroached upon them. For example, Chennai had numerous lakes, but the state government's Slum Clearance Board constructed apartments on these lakes. As a result now whenever there are rains the city gets flooded,

as the water can no longer drain into the lakes. Similarly, Mumbai has encroached on its wetland and now draws its water from the Vaitarna and Bhatsa dam, which are 100 km from the city.

Also in the case of Indore, the Khan River has been polluted and since the Yastwar Sagar dam in its vicinity was not maintained either, the city now receives water from the Narmada River, which is 70 km away. The water is produced at the cost of Rs 10 per kl, but sold at a subsidized cost. The Khan River polluted by Indore city pollutes the Shipra river in turn, which is the drinking water source for Ujjain city, and located downstream of Indore. Hence Ujjain instead of drawing water from the Shipra now draws water from the Gambir River which is at a distance from the city.

In this context I would like to state that cities need to learn how to manage its water resources and protect its water resource instead of withdrawing from new source, which is leading to conflicts.

[Satya Prakash Mehra](#), Rajputana Society of Natural History, Rajasthan (response 4)

I agree with [Lak Tewari](#) – the heinous practice of caste-based discrimination and the resultant conflicts over drinking water are still prevalent. It is difficult to believe that such practices are still widespread in this day and age. We were also shocked when we found that such discrimination over drinking water sources is still prevalent. Those who want to know more about this can visit Achalpura village, Murwara Panchayat in Bharatpur.

It is an area with a dominant deprived community population, which lacks drinking water supply. During droughts, members from the deprived community carry water over long distances, and are not permitted to use the bore well which is at close proximity. This is because a temple is located at the vicinity, which they are not allowed to visit.

This is a hard fact to believe, but is true. It is due to the same problem that a group has started working there to revive the sources of drinking water for this village. We wish them success.

On the other hand, we found a very positive approach in villages located in the southern belt of Rajasthan, where there are no caste-based discriminations over drinking water supply.

[Sudhirendar Sharma](#), The Ecological Foundation, New Delhi

I doubt if we have made much headway, the diagnosis is presumptuous. Most of us are part of one or the other warring factions, though passive and consciously unaware of our contribution to water conflicts.

As I pull the flush every day, I contribute to the expanding inequality and fuelling conflict. Without doubt, it is more by default than design at my end although it is a designed fault that has been left unquestioned! I am not absolving all of us by pressing 'default' into the argument but wonder if we have not accepted 'cause' at the cost of 'effects'.

Examine the distinctiveness in the manner in which 'water' has been expressed in the recent past - water, drinking water and safe drinking water. My friend Umendra Dutt has elaborated the distinction. The term 'water', as used till the late 1970's, was inclusive - counting all flora and fauna into it. The evolution of the term 'drinking water' made it exclusive for humans with targets set to make it (drinking water) accessible to all. The recent advent of the term 'safe drinking water' has taken a giant leap by creating water haves and have-nots amongst the society - economics being the dominant criteria. So, while I use 'drinking water' to flush my toilet I use 'safe drinking water' (bottled) for my survival. Haven't we drawn the battle lines ourselves?

While documenting water mutinies may be an interesting 'civil' society engagement, the challenge is to press the 'rigor of analysis' button to unveil the core issues. Failing this, we will strengthen those

who leave no stone unturned to bring forth 'demand' rationalisation by arguing in favour of privatisation and no less dangerous - the 24x7 water supply.

[Anupam K. Singh](#), Nirma University, Ahmedabad

This is in response to the observation made by [Ashok Kumar](#) on the conflicts over drinking water in urban areas. I wish to cite the research results obtained from a primary survey conducted in Ahmedabad city from 13 September to 18 October 2008. Water metres of 25mm from a reputed ISO 9001-2000 certified company were installed at several locations. The households were from varying income groups, family sizes and plot sizes, water storage capacities, with and without gardens and varying water supply durations.

The family size varied from 4 to 9 persons per household and thus the plot size too – from 1620 sq. feet to 5535 sq. feet. The duration of water supply was found to be between 3 hours to 8 hours between 7:00 -9:00 am, 12:00-15:00 pm and 7:00-10:00 pm daily. The water storage capacity (overhead and underground) too varied – from 1500 litres to 32,000 litres, depending on additional water requirements for gardening. The water consumption pattern was observed to range from 124 to 458 litres per capita per day.

In view of the above observations, several issues need to be addressed, including the urban water supply-consumption pattern. Is water distribution uniform for various wards? In order to prevent conflicts over drinking water we need to figure out if we can stop drinking water supply from being used for gardening and the institutional mechanisms that the municipal authorities need to adopt in this regard. Further, to avoid conflicts water conservation awareness is required for educated residents as well.

[K. J. Joy](#), Forum for Policy Dialogue on Water Conflicts in India, Pune (response 1)

This is in response to the points made by [R. Kulasekaran Srinivasan](#) and [Sudhirendar Sharma](#).

I think R. Kulasekaran Srinivasan brought out two important dimensions of the conflicts over drinking water by citing some important cases. One is the diversion of water from the rural areas to the cities, thus depriving the rural areas of their drinking as well as irrigation water. The second issue is that of pollution and he has cited the case of Musi. I wanted to know if he has or knows about any detailed case studies regarding these as it would be good to make them available to the community.

He has also mentioned the wastage of water in urban areas. This is very true. But similar is also the case in rural areas, especially with regard to irrigation water. So we need to also think about saving water in the agricultural sector as well. For example, the System of Rice Intensification (SRI) is being promoted in the case of rice for saving water. The water thus saved can be made available to other uses for drinking purposes and to other users who are deprived of water.

The point made by [Sudhirendar Sharma](#) is also well-taken about the tendency to look at water without its context and surroundings. In fact, we need to consider water as an ecosystem resource, or a resource embedded in the ecosystem. And, not as one that can be manipulated the way we want to – most of our water resource planning and development has been based on this approach of viewing water as a free resource, which can be easily manipulated.

[Shalini Jain](#), SEEDS India, New Delhi

Women's lives are intricately linked with water and, therefore, with the associated conflicts over drinking water as well. With heavy clay water pots on their backs, women and young girls travel great distances on foot to fetch water from polluted streams to fulfill their basic needs.

In Jolpur, Bangladesh, during floods, when all the tube wells went under water, women had to travel great distances through chest-high waters to collect drinking water and also evolve techniques to take water out of the tube well without mixing it with flood water.

In the villages of Rajasthan, women have to spend more time in collecting fuel and water as sources begin to dry up. Men folks migrate in large numbers leaving the women all the more burdened especially in times when the availability of adequate nutrition and clean drinking water dwindles. In Patan, Gujarat, Dalit women are all the more marginalised and discriminated. For them the exploitation begins at the water taps. They are forced to take brackish water and have to beg the landlords for a few pitchers of drinking water. In these trying times, they are immensely subjected to sexual exploitation by *thakurs* and landlords in return for quenching the thirst of their families and children. The study on drought in Rajasthan revealed that water from the tube well was sometimes issued only in the middle of the night and women had to walk up to 4 miles in the dark and at grave risk to access it.

Swajaldhara is a national-level rural water supply scheme in India. Under this system, the Panchayati Raj institutions will bear all operation and maintenance costs; they will bear 10 per cent of the total capital cost by collecting funds from the people. The rest of the money for the project, which follows the market-centric World Bank model, comes from international donors. This effectively rules out the poor, particularly women, from having any say, leave alone control, over water. The recent Water Policy pays lip-service to the role of women in accessing water, wherein it is merely stated that "they should be involved." The policy clubs them with other stakeholders such as the Scheduled Castes, the Scheduled Tribes and other marginalised sections. It fails to recognise that women, cutting across these categories, face immense problems in accessing water.

Civil societies and NGOs often discuss a decentralised approach to water management initiatives with women at the centre of the debate. However, until the Water Policy begins to take note of the complex water situation and take the ground realities into consideration, women will continue to bear the entire burden of having to provide water for the family.

For more information please read Frontline, Volume 20, Issue 20, 27 September – 10 October, 2003 and also visit <http://www.ambedkar.org/News/hl/Landlords%20exploit.htm> for an article titled, Landlords Exploit the Drought hit Dalit Women – The Silence of the Lambs.

S. V. Vijaya Kumar, National Institute of Hydrology, Kakinada

Most of the conflicts over drinking water are common over space and time wherever and whenever its shortage is felt. That is, when demand is more than supply. However, some conflicts are unique and have nothing to do with general problems. Such issues can be resolved even by water delivery agencies and/or the administration.

I quote an incident. People of a suburban settlement were dependent on municipal water supplies from the neighbouring municipality as the groundwater there was saline. One day the municipal authorities cut the supplies to the suburban area stating that they had no right to the water and that they had not paid the previous water charges. The actual reason may be political, however, the district administration had to intervene and solve the problem as providing drinking water to that hamlet was most important. During summer such conflicts can be more severe as water is in high demand as supplies dwindle.

R. Kulasekaran Srinivasan, Centre for Science and Environment, New Delhi (response 2)

There are several case studies on water conflicts apart from the Musi River in India. I would like to draw your attention to a recent study conducted by the Centre for Science and Environment (CSE) in the Pali

river basin, Rajasthan. CSE provided the community with water testing kits. With the training and technical guidance from CSE's Pollution Monitoring Laboratory, the community members in Pali village were able to monitor the water quality in the area.

The findings of the community have become a big election issue now, with the people asking politicians what they intend to do to clean up the rivers in the Bandhi and Luni basins which are polluted by industrial effluents. The conflict here is that farmers are deprived of water for irrigation purposes due to pollution of rivers by the CETP effluents, and until now they did not have water pollution data to take it up to the government. Now, with the water testing kits provided by CSE the community feels empowered to take up the issue with the government.

The details of the findings of the farmers with regard to water quality in the area can be viewed at <http://www.solutionexchange-un.net.in/environment/cr/res-12110801.pdf>.

Lak Tewari, India Canada Environment Facility (ICEF), New Delhi (response 2)

Shalini Jain's examples are good and speak of ground experience. I would like to make two points regarding the same-

- The travails of rural women in collecting drinking water are widespread - all over the country, especially in the hills.
- Rural water supply schemes need to consider women and their problems separately. When they are clubbed with the general community, the schemes fail to address their problems. The powerful (men) still rule the villages. This is true for all services including access to water and water delivery services (and other programmes such as the rural roads programme). Women are consulted as part of the community (gathering). Later policy makers wonder why the schemes have not benefitted the rural women. Benefit analysis from a gender sensitivity point of view is done afterwards or as an after thought.

The example of women from Bangladesh drawing water from wells during floods is a good one and members would benefit from details regarding the same.

K. J. Joy, Forum for Policy Dialogue on Water Conflicts in India, Pune (response 2)

The following article on the lack of potable water in such a large number of villages may be of interest and relevance for the on-going discussion on conflicts over drinking water. The same was published in the Times of India on 19 November 2008. Please find the same quoted below

“Cheap ration — like rice at Re 1 per kg — is a common poll slogan of political parties in various states in election mode, but politicians appear unconcerned about providing safe drinking water to crores of villagers, in the grip of dreaded diseases like fluorosis, arsenic lesions and nitrate poisoning.

In a startling disclosure, the Centre told the SC in a recent affidavit that a majority of people living in 2.17 lakh villages were facing serious problem as their drinking water sources were polluted by chemicals.

Under rural drinking water supply, the survey done indicated that there are 216,968 rural habitation affected by poor water quality — fluoride affected 31,306 villages, salinity affected 23,495, iron affected 118,088, arsenic affected 5,029, nitrate affected 13,958 and multiple factors affected 25,092, said the affidavit filed by health ministry.

Take for example the 31,306 villages affected by excess amount of fluoride in drinking water. This causes a dreaded and incurable disease fluorosis in human beings and animals which leads to mottled teeth,

dental carries, stiffened brittle bones and joints, metabolic disorders and even paralysis in advanced stage.

Majority of these villages fall in Haryana, Delhi, Rajasthan, Gujarat and Andhra Pradesh. The Centre assured the Supreme Court in just one line: The government is giving emphasis for tackling water quality problem. Up to 20% funds of the Accelerated Rural Water Supply Programme (ARSWP) are specifically earmarked for tackling water quality problems, the ministry said. It informed the court that under 'Bharat Nirman' scheme, a plan was afoot to build rural infrastructure in four years time. Rural drinking water is one of the components of the said plan and under this, it is envisaged to address the problem of quality of water, it added.

The dreaded arsenic poisoning of drinking water sources is acute in West Bengal and also prevalent in UP, Madhya Pradesh and Assam, where surveys have identified people suffering from arsenic lesions."

Uday Bhawalkar, Bhawalkar Vermitech Private Limited, Pune (response 1)

The conflict situation over drinking water availability has been caused by industries, which do not have access to cost-effective waste treatment technologies. As a result drinking water is getting polluted by industrial effluents.

Many new eco-technologies are now available, such as BIOSANITIZER, that actually convert pollution into resources without any recurring expenses. The investment is recovered within a year from these resources. With this new eco-technological approach industries can easily achieve a 'zero discharge' status which is going to be the future goal for industries. This will also prevent drinking water pollution and the resultant conflicts over water between industries and communities. Please visit www.ecoguru.org for more details.

B. L. Kaul, Society for Popularization of Science and Progressive Educational Society, Jammu

Caste discrimination with regard to access to drinking water is a scourge we live with, leaving scars on the psyche of the victims of the obsolete caste system. It is really unfortunate that even after over sixty years of independence we have not been able to get rid of it. In fact, most of our politicians play the caste factor to their advantage for winning elections. So, they pay lip sympathy to eradicating this system.

Since panchayat is the basic unit in rural areas where caste sentiments are still strong it can play a pivotal role in eradicating caste discrimination, and ensuring greater access to water resources by the disadvantaged communities. The panchayats alone can help change the mindset of the people. It is surprising that education has helped to change so many things in the country but has failed to change our mindset. The fight against caste discrimination with regard to water access is going to be a long one; however, I am sure that in the end we will overcome.

Arun Jindal, Society for Sustainable Development, Rajasthan

The query is very apt – on one hand national and international institutions are raising fund for ensuring access to drinking water and the other hand millions of people are unable to access safe and adequate drinking water. In fact they are fighting with each other for their very survival.

I would like to draw your attention to a few cases of conflicts over drinking water:

There has been a reduction in the availability of safe and adequate drinking water in Karauli, Rajasthan due to the construction of the Panchana dam. Until now, the Bhadrawati River was a source of drinking

water supply in and around Karauli. But with the river drying up, the state government has initiated a scheme (at a cost of Rs. 500 crores) to draw water from the Chambal River to meet the drinking water needs of the town. The Chambal is located very close to the Gharial Wild life sanctuary, and it has been the demand of the Bhadrawati Bachao Sangharsh Samiti to ensure that the withdrawal of water does not affect the sanctuary.

Similarly, the Gambheer River has dried up because of the Panchana dam constructed on the river, thereby obstructing its flow. As a result almost 350 villagers in the area have been deprived of water, as their wells and handpumps now run dry.

Thus, we can see how investment in water schemes without factoring in an ecological study of the water source can have adverse impacts. Mr. Juned from SPWD and I have authored an article titled, Conservation and Restoration of Lakes, published by the National Institute of Hydrology, Roorkee in October 2008 which may be of relevance for this discussion.

D. K. Manavalan, Action for Food Production (AFPRO), New Delhi

I appreciate [Shalini Jain](#)'s message. Our experience suggests that there are no conflicts emanating from the rural communities. If we look at the provisions of the Constitution of India on drinking water, it is the responsibility of the Panchayati Raj Institutions. Article 243 G clearly states that state governments should make use of these provisions to decentralize, empower and capacitate Panchayats/Municipalities. However, state governments have not made use of this constitutional provision at the state level and district level leading to the conflict situation over drinking water in various parts of India.

The only solution to avoid and reduce water conflicts is to make arrangements for capacitating the women/men for implementation of drinking water projects and upkeep of the assets. This will be a big area of work.

It is necessary that NGOs and CBOs work together and impart trainings to communities to meet this challenge so that water is available at every door step. Action for Food Production (AFPRO) continues to work in this regard.

Sarita Mehra, Rajputana Society of Natural History (RSNH), Rajasthan

I would like to draw your attention to the fact that unequal distribution of drinking water is a major area of conflict.

I would like to state that the rural population conserves more water and usually draws water from community tanks and/or community pond and community bores. On the other hand, the urban population has several discussions regarding access to water and yet choose to do nothing about the problem. There is also a lot of wastage in urban areas such as usage of drinking water for gardening, and flushing, etc.

This is probably because water is valued differently in the rural and urban settings. In rural areas, people have to travel long distances to access water, where as in urban areas drinking water is supplied by the government. This unequal access to drinking water has to be checked and there is a need to devolve policies that ensure equitable access to water in both rural and urban areas.

I belong to a village from the Sirohi district of Rajasthan and have faced acute water shortages. At present I am engaged in awareness programmes related to conservation of water resources.

Uday Bhawalkar, Bhawalkar Ecological Research Institute, Pune (response 2)

This is in continuation with my previous response to this query, wherein I noted how pollution of water sources, by industries and other users, is a major area of conflict and merits immediate attention. In this connection, I would like to cite an example and draw your attention to a cheap and efficient method of treating pollution, which can largely address the conflict situation.

The very fact that we have a spare kidney and not heart or brain, implies that kidney is the most critical organ in human body. In man-made systems also, we keep a spare pump or other equipment standby so that the system can run without a gap. The kidney is there to remove the extra inorganic load from blood. This also means that we should be careful to restrict inorganic pollution from entering our body. These could be nitrates, sodium, chlorides, fluorides, sulphates, and heavy metals coming from food and water and NOx coming from the air.

Water is used by us to flush out the pollution from our body and also to wash food, utensils, clothing, etc. This job can be performed well only if the water is clean and does not have inorganic compounds. Although WHO recommends 45 ppm as the limit for nitrates, this limit should be much lower. Probably the limit is set by the available technologies. Inorganics are raw materials for plants, along with CO₂. Hence only plants can clean water of inorganic pollution. This method is called phytoremediation or root-zone treatment.

We have compressed 1 acre of natural forest into 100 mg of natural bio-catalyst called BIOSANITIZER. It is an ecochip or 'ecology on a chip'. If BIOSANITIZER is dropped in a well/borewell, at a dose of 100-500 mg, we get a sustainable in-situ water treatment plant in action. The output water is clean and also 'healing' that is, it has self-purifying ability and resists recontamination with chemicals (organic or inorganic). Germs (pathogens) and pests actually come to consume the nitrates and hence are not the true problem. They are just the bioindicators of pollution. Trying to kill them with heat or poison is an eco-crime.

For more details you may read a paper which I presented at the SACOSAN III held in New Delhi. The same is available at <http://www.solutionexchange-un.net.in/environment/cr/res-12110802.doc>.

Sejuti Sarkar De, Society for Natural Resource Management and Community Development (SNRMCD), New Delhi

I would like to share my experience with conflicts over drinking water in Uttar Pradesh. For evaluating a forestry scheme under the Forest Development Agency (FDA), I visited a village near Nawabganj at Unnao in Uttar Pradesh. Under Entry Point activities for initiating Joint Forest Management (JFM) in the village, the Forest Department dug a tube well for drinking water purposes. The Forest Protection Committee (FPC) members, who belonged to the dominant castes, used their power to dig a tube well near their houses. People belonging to the disadvantaged castes, who lived in the outskirts of the village, were not allowed to draw water from that tube well. Other tube wells in the village being defunct, these people were using the water of the irrigation pond for drinking purposes. Many of the women and children of these families suffered from water-related diseases. The Panchayat and Forest Department showed reluctance in intervening in the matter saying that it was "the internal matter of the village".

This kind of conflict and caste discrimination can be observed all over the country, not only over drinking water but on sharing other natural resources as well. Short-term awareness campaigns have little effect and government departments at the local level are not interested in resolving the matter. Education, gender empowerment and focused long-term intervention, preferably by NGOs, can help solve the problem to a certain extent.

R. Jagadiswara Rao, Sri Venkateswara University, Tirupati, Andhra Pradesh

This is in response to the issue of conflicts over water as a result of groundwater unavailability, which has been noted through this discussion. Sand in riverbeds allows rainwater to infiltrate to provide much-needed groundwater of high quality through low-cost shallow tube wells (filter points) and infiltration wells for drinking and other purposes. The problem with most minor riverbeds in south India is that they carry very little sand. Extensive mining of sand in riverbeds is equally essential for construction. Since depletion of sand also depletes groundwater, there has been demand for imposing ban on sand mining. As substitutes for sand are costly and ineffective, any ban on sand mining affects construction industry.

Our work in Sri Venkateswara University has revealed that the large quantum of sand generated in the riverbeds by geological processes is more than adequate to meet the requirements of both the users of sand and of groundwater within sand on sustainable basis. The real problem is that most sand generated by a river, while remaining for some period in the riverbed, is lost ultimately to the sea during floods. The best way to resolve the conflict is through construction of a cascade of sand dams across rivers at suitable places to conserve large quantities of sand all along the river. The quantum of sand used for construction is negligible compared to that stored by these sand dams.

Sand dams differ significantly from check dams or subsurface dams. A check dam allows deposition of not only sand but also finer particles of silt and clay. As a subsurface dam is below the bed level, it only arrests groundwater but not any sand. A sand dam rises above the riverbed level progressively to store only good quality sand without containing the finer particles of clay and silt. The webpage <http://www.indiawaterportal.org/blog/wp-content/uploads/2008/01/sanddam.jpg> shows a picture of a sand dam. The sand so accumulated also stores substantial groundwater. Construction of sand dams in the arid and semi-arid tracts of Africa has helped people there to get requisite water for drinking and other purposes throughout the year.

Construction of a cascade of sand dams across minor rivers spread evenly in many parts of India will help to provide high quality groundwater for drinking and other purposes, and thereby reduce conflicts caused by water shortages.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for the Water Community in India at se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-watr] Query: Conflicts Over Drinking Water - Experiences. Additional Reply."

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