



Environment

Water Community



Solution Exchange for the Water Community Consolidated Reply

Query: Mining Induced Conflicts over Water - Experiences; Examples

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 20 February 2009

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 individuals, institutions and organizations – both academic and civil society. The Forum has documented conflicts and published these in the form of a book titled “Water Conflicts in India: A Million Revolts in the Making”. More details about the forum are available at <http://conflicts.indiawaterportal.org/>

Mining contributes significantly to India's GDP but has major environmental and social implications. Mining, for sand and minerals, has been one of the leading causes of conflicts across the country and there have been many agitations and legal interventions. Along with rock quarrying, mining for minerals like coal, iron ore, bauxite and limestone impacts the quality of water and drastically lowers the water table. Mining also results in sedimentation, affecting the storage capacity of dams. It leads to confrontations between local people and mining companies over loss of agricultural land, lack of access to water and rehabilitation.

Mining for sand and minerals has the following impacts and hence a potential for conflicts:

1. It is a revenue resource for state governments and panchayats
2. It is a source of livelihood for local people, usually fetching better incomes than farm labour
3. Unregulated and indiscriminate sand mining affects the health of riverine ecosystems
4. It affects the hydrology of rivers as sand acts as an aquifer and indiscriminate sand excavation leads to water scarcities, especially for drinking water in summer
5. This scarcity affects agriculture and thereby local livelihoods
6. Very often there is a nexus between local politicians-contractors-bureaucrats in this operation and the fight is between this nexus and the local people.

In this context, we request community members to share their experiences on the following issues:

- Instances of conflicts over sand mining from river beds, giving details of the location of the conflict, the conflicting parties, issues at stake, present status and mining licensing issues
- Other conflicts over mining in general, with similar details
- What can be done to prevent such conflicts and lessons from their outcome?

We are documenting conflicts around water and this is the third in the series of queries. 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. [R. Jagadiswara Rao](#), Sri Venkateshwara University, Tirupati, Andhra Pradesh
2. Kuntala Lahiri-Dutt, Research School of Pacific and Asian Studies, The Australian National University, Australia ([Response 1](#)) ([Response 2](#))
3. [Sunetra Lala](#), United Nations Children's Fund (UNICEF), New Delhi
4. [Bhargavi S. Rao](#), Environment Support Group, Bangalore
5. [Muhammad Mukhtar Alam](#), Centre for Ecological Audit, Social Inclusion and Governance, New Delhi
6. [Himanshu Thakkar](#), South Asia Network on Dams, Rivers and People (SANDRP), New Delhi *
7. [S.V.R.K. Prabhakar](#), Institute for Global Environmental Strategies (IGES), Japan *

**Offline Contribution*

Further contributions are welcome!

[Summary of Responses](#)
[Comparative Experiences](#)
[Related Resources](#)
[Responses in Full](#)

Summary of Responses

Sand mining in river beds is the main source of raw material for the construction industry across the country, but the industry invariably runs into trouble with local people when it affects their water supply. The percolation capacity of a river depends on the volume of sand in its bed and if this sand is removed on a large scale, it affects the groundwater, the river's ecosystem, and eventually, water availability in settlements around the river. This is the basis for conflicts over sand mining in river beds.

Members cited several **examples of conflicts over sand mining** across the country. For example, in **Karnataka**, builders and real estate extract hundreds of truckloads of sand to supply the real estate boom in the Shimoga district. The government awarded contracts to mine sand amounting to a whopping Rs 1.21 crore in 2008. This has to conflicts with people living downstream as the [Tunga River](#) is the lifeline in 10 districts in central and north Karnataka, where it becomes the Tungabhadra river.

Members noted that in the [Kali Valley](#), sand worth several crore rupees is mined every year in the Chandewadi and Ilavadabe forests, which surround the Pandari River. Mechanized mining has

been going on for several years in an area of about 1200 acres of forest land, and about 400 truckloads of sand are extracted daily. The State Department of Mines and Geology has issued temporary licenses for sand mining but there does not appear to be any correlation between the issued licenses and areas being mined. A local NGO, Parisara Samrakshana Kendra (PSK), has been trying to bring about awareness about this amongst the people through the [Kali Bachao Andolan](#).

Members reported illegal mining in other river basins in Karnataka, particularly in arid and semiarid tracts. For example, there have been frequent clashes near the Uttara Pinakini River in [Gauribidanur](#) of the Kolar district between the local population and mining interests because their activities have depleted water resources.

Members also noted the case of [Tamil Nadu](#) where after intense studies in different regions and interaction with the affected people, the Campaign for the Protection of Water Resources has identified 15 adverse consequences of sand mining that were brought out in a public hearing. These include the depletion of groundwater; lesser availability of water for industrial, agricultural, and drinking purposes; destruction of agricultural land; loss of employment to farm workers; threat to livelihoods; human rights violations; and damage to roads and bridges.

Members pointed to another example of conflict caused by heavy sand mining from the Chittoor district of [Andhra Pradesh](#). Illegal mining in the Upper Papagani River catchment has depleted groundwater and caused a shortage of water for drinking and irrigation.

Removal of sand by mining from riverbeds immediately affects groundwater, as it is this sand that allows rainwater to percolate into the aquifers. At the same time, mining of sand is essential for construction; this benefits not only the mine owners but also several people connected with mining. Substitutes for sand have not become popular owing to their high cost.

Other than sand, **mining for major minerals** is another flashpoint between industry and local people. Members provided several instances of such conflicts. For example, the [Arkawati](#) river basin, in Karnataka is affected due to granite mining, and the locals have been protesting against the same.

There are several reported cases from **Orissa**, where the aluminium company BALCO has mining operations in the [Gandhamardhan](#) forests; local tribal women have been protesting its operations for nearly three decades. And, in the [Rayagada](#) district, several people have been killed in clashes with the police while protesting against mining activities. Similarly, in the [Kalahandi](#) district farmers have often clashed with bauxite mining companies over loss of their water allocation.

Members pointed out that in the Doon Valley, [Uttarakhand](#), large scale limestone mining has destroyed the ecology of the region, affecting water supplies for several villages until the Supreme Court intervened and shut them down. Similarly, in [Haryana](#) mining for stones has also lead to depletion of groundwater in the region and led to conflicts between the local residents and the mining companies.

Members felt that on one hand, mining activities not only lead to conflicts over water resources but also include conflicts over land acquisition, loss of other natural resources and livelihoods, and pollution. On the other hand, members felt well-regulated mining is also an imperative for the economy and creation of local livelihoods.

Members also suggested some **conflict resolution mechanisms** to address the issue. The construction of sand dams (walls of sand across a river channel) could balance the needs of miners with the water requirements of local communities, as they help augment groundwater

storage. Studies in the Swarnamukhi River in Chittoor and Nellore districts of Andhra Pradesh have indicated that the river is best suited for the construction of sand dams rather than check dams or subsurface dams. Construction of such cascade of sand dams all along its riverbed can store 78 million cubic metres of sand and 20 million cubic metres of groundwater. Any rain falling in and around these dunes infiltrates and saturates the sand with groundwater that feeds springs throughout the year.

Finally, members recommended that women need to be an integral part of consultations and public hearings in conflict situations. Members said miners have to ensure safe and adequate water supply for affected communities, and pay adequate compensation for land and water resources. Panchayati Raj Institutions need to be empowered to handle these negotiations and ought to be represented in the local conflict resolution committees.

Comparative Experiences

From [Sunetra Lala](#), *United Nations Children's Fund (UNICEF), New Delhi*

Haryana

Mining for Stones Leads to Conflicts with Local Residents, Faridabad District

Mining for stones in the Aravali hills in Faridabad has destroyed the watershed of this region. As a result, several large lakes have dried up in the area. This has also affected the groundwater levels in the area bringing down agriculture. The mine owners claim it is an essential activity for supplying building material to Delhi while local residents feel their water resources have been depleted. This has resulted in conflicts between villagers and the mining companies.

Karnataka

Sand Mining in Gauribidanur Results in Conflicts With Locals, Kolar District

The Uttara Pinakini River in Gauribidanur has dried up due to unrestrained and illegal sand mining. This has led to several violent clashes between the mine operators and the local residents of the area. Following this, a study by the Central Government corroborated the facts and suggested that sand mining ought not to be allowed beyond one metre depth in the river bed. However, influential villagers continue to mine sand without permission. Read [more](#)

Granite Mining Leads to Water Conflicts in the Arkawati River Basin, Bangalore

Residents of Dobbabalapur taluka in Bangalore were facing severe water shortages as a result of the declining water in the Arkawati river basin due to granite mining, and protesting against the same. To address this conflict, a farmer's body, Karnataka Rajya Raitha Sanga, was constituted to represent the farmers. They are now active participants in the assessment of the effects of mining on water bodies and feel empowered to deal with the conflict. Read [more](#)

Orissa

The Save Gandhamardan Movement Protests against Mining Company, Baragarh District

The Bharat Aluminium Company (BALCO) started bauxite mining operations in the Gandhamardan forests, which feed 22 perennial streams. Since 1985, the adivasi women of the Save Gandhamardan Movement have blocked the movement of vehicles of BALCO. The tribals have obstructed the work of BALCO and refused to be tempted by the company's offer of employment. Even the police has failed to weaken their determined protests. Read [more](#)

Conflicts over Bauxite Mining leads to Death of Three Tribal People, Rayagada District

Since 1993 the tribal people of Kashipur and Laxmipur blocks, an area rich in water resources, have feared the loss of water resources due to the arrival of bauxite mining companies. Concerned over this, local people started organising themselves. Road blockades, demonstrations and dharnas were organised in front of government offices. As a result of this conflict situation, three adivasis were killed in police firing during protests. Read [more](#)

Farmers Clash with Bauxite Mining Companies over Allocation of Water, Kalahandi District

Farmers in the command area of the Hirakud dam have been losing their water allocation to Vedanta Alumina, a bauxite mining company, in the densely forested areas of the Niyamgiri hills. A quarter of their fields do not get any water anymore as the water diverted to the company has increased 27 times in the past decade. The mining activities have resulted in frequent clashes with the Dongraria Kondh tribe in the area. Read [more](#)

Tamil Nadu

Public Hearing Brings to Light the Threat Sand Mining Poses to the Palar River Basin, Cuddalore District

The significant increase in sand mining since the beginning of the 1990s has severely affected the river basin of the Palar River. To draw the attention of the government to the magnitude of the problem, the Campaign for the Protection of Water Resources arranged a public hearing on the impact of sand mining, where families deposed in the presence of a jury. Following this, the jury recommended a total ban on sand mining in the upper reaches of the River. Read [more](#)

Uttarakhand

Limestone Quarrying affects Local Rivers and Streams in the Doon Valley, Doon Valley

Mining of limestone in the villages of Nahi-Kala and Thanu had affected the rivers and streams in the area. This is because the limestone deposits, besides being a reservoir of water, overlaps the catchment of these streams. The activists of the Chipko movement, with local communities, fought a case against the mining companies in the Supreme Court. In 1985 the Supreme Court bench passed an order closing 53 of the 60 limestone quarries in the Doon Valley. Read [more](#)

Related Resources

Recommended Documentation

From [Sunetra Lala](#), *United Nations Children's Fund (UNICEF)*, New Delhi

Ecology and the Politics of Survival - Conflicts Over Natural Resources in India

Book; by Vandana Shiva; Navdanya; Sage Publications India Private Limited; New Delhi; 1991;

Available at <http://www.unu.edu/unupress/unupbooks/80a03e/80a03e00.htm>

Details several cases of conflicts over mining and water resources in India with examples of how some of these cases have been resolved

Profits over People

Article; by Ali Kishore Patnaik; The Frontline; Chennai; 2001;

Available at <http://www.hinduonnet.com/fline/fl1801/18010330.htm>

Describes how the attempts to suppress a people's movement against a mining project impacting water resources in southern Orissa lead to the death of tribal people

Negotiated Transactions as Conflict Resolution Mechanisms: Water Bargaining in the U.S.

Book; by K. William Easter, Mark W. Rosegrant and Ariel Dinar; Springer US; USA; 1998;

Available at <http://www.springerlink.com/content/px20nk7461054103/>

It explores negotiated transactions as a tool for resolving conflicts over mining and water resources through analysis of conflicts in the American West

Depletion of Freshwater in the Mining Regions of Goa, India: Gendered Impacts and Responses

Paper; by S. Sonak; TERI Press; New Delhi; 2006;

Available at <http://www.teriin.org/teri-wr/pub.htm>

This paper focuses on the human dimensions of changes in the groundwater level in the mining belt of Goa from a gendered perspective, and the conflicts therein

Mining Dangers

Article; by S. Viswanathan; BIOME; The Frontline; Chennai; 2002;

Available at <http://www.hinduonnet.com/fline/fl1910/19100440.htm>

Describes how a public hearing brings to light the serious threat and conflict situation sand mining poses to the water resources and livelihoods in many districts of Tamil Nadu

Sand Mining: Middlemen make Merry

Article; by G.D. Belgaumkar; The Hindu; Chennai; 2005;

Available at <http://www.hindu.com/pp/2005/06/25/stories/2005062501040100.htm>

Explains how the sand mining activities in Kolar district has affected the Uttara Pinakini River which is drying up and the resultant conflict situation with the locals

Sand Extraction from Agricultural Fields around Bangalore: Ecological Disaster or Economic Boon?

Article; by Rajendra Hegde, S. C. Ramesh Kumar, K. S. Anil Kumar, S. Srinivas and V. Ramamurthy; National Bureau of Soil Survey and Land Use Planning, Regional Centre; Current Science; Bangalore; 2008;

Available at <http://www.ias.ac.in/currensci/jul252008/243.pdf> (PDF; Size: 80KB)

Describes how sand extraction from agricultural fields around Bangalore is resulting in depletion of groundwater resources in the area and leading to conflicts

Impact of Sand Mining on Local Ecology

Paper; by S. Sonak; TERI Press; New Delhi; 2006;

Available at <http://www.teriin.org/teri-wr/pub.htm>

Presents a review of sand mining activities and the resulting issues of coastal erosion, river bank erosion, land-use change, water depletion, and biodiversity loss

Sharing of Water Between Rural, Urban and Peri-urban Areas Located along Arkawati River Basin in Karnataka

Paper; by Bharti Patel; SVARAJ (Oxfam India Society); Jal Bhagirathi Foundation; Jodhpur;

Available at http://www.svaraj.in/html/publications/pdf/sharing_of_water_casestudy.pdf (PDF; Size: 264KB)

Presents a case study of the conflict with local farmers over depleting levels of water in the Arkawati river basin due to mining activities and how the conflict is being resolved

Illegal Mining goes Unchecked (from *Himanshu Thakkar*, South Asia Network on Dams, Rivers and People (SANDRP), New Delhi)

Article; by Nurpur; The Tribune; Chandigarh; 15 March 2009;

Available at <http://www.tribuneindia.com/2009/20090316/himachal.htm#10>

Describes how the illegal quarrying on the Chakki rivulet had brought down the groundwater level and thus resulting in drying up of wells and hand pumps

From Kuntala Lahiri-Dutt, Research School of Pacific and Asian Studies, The Australian National University, Australia; [response 1](#)

May God Give us Chaos, So that We may Plunder: A Critique of 'Resource Curse' and Conflict Theories

Article; by Kuntala Lahiri-Dutt; The Australian National University; Women in Action; Manila; August 2006;

Available at http://www.accessmylibrary.com/coms2/summary_0286-29420778_ITM

It scrutinises the increasingly popular theories of the natural resources curse, natural resource conflicts, particularly in relation to water conflicts arising out of mining activities

Engendering Mining Communities

Article; by Nesar Ahmad and Kuntala Lahiri-Dutt; Jawaharlal Nehru University and The Australian National University; Gender, Technology and Development; Thailand; 2006;

Available at <http://gtd.sagepub.com/cgi/content/abstract/10/3/313>

Discusses how forced displacement due to mining activities impacts the lives of women in the regions of Jharkhand in eastern India

From [Bhargavi S. Rao](#), Environment Support Group, Bangalore

Sand Mining in the Kali Valley

Article; by Padmashree Raghavan; Environment Support Group; Bangalore; September 2003;

Available at <http://www.solutionexchange-un.net.in/environment/cr/res-20020902.doc> (DOC; Size: 32KB)

Describes how illegal sand mining in the Kali Valley, Tamil Nadu has led to degradation of water quality and the conflict situation arising as a result

Six Major Dams, A Nuclear Power Plant, A Paper Mill And Now Another Dam? Memorandum To Honourable Chief Minister of Karnataka Shri. S. M. Krishna

Memorandum; by Kali Bachao Andolan; Parisara Samrakshana Kendra and Environment Support Group ; Bangalore; June 2003;

Available at <http://www.solutionexchange-un.net.in/environment/cr/res-20020903.doc> (DOC; Size: 48KB)

A memorandum protesting against the dam building activities in the Kali River which is leading to a conflict situation with the locals over water resources

Groundwater Depletion in Papagani Catchment (from [R. Jagadiswara Rao](#), Sri Venkateshwara University, Tirupati, Andhra Pradesh)

Article; by M. Chandrasekhara Rao; Economic and Political Weekly; Mumbai; February 2006;

Available at http://epw.in/epw/user/loginArticleError.jsp?hid_artid=1728

Illustrates how illegal and excessive sand mining in the Upper Papagani river catchment in Karnataka has caused depletion of groundwater and the conflicts thereof

From [Sunetra Lala](#), Research Associate

Greed Comes in Tunga's Way

Article; by Veerendra P.M.; Deccan Herald; Chennai; December 2008;

Available at <http://www.deccanherald.com/content/Dec162008/spectrum20081215106865.asp>

Describes how illegal sand mining is sounding the death knell for the River Tunga and leading to conflict situations with the local population

Scientists Divided over Seabed Mining for Sand - Call for Detailed Study before Issuing Permits

Article; by Business Line; Thiruvananthapuram; March 2003;

Available at <http://www.thehindubusinessline.com/2003/03/06/stories/2003030601311700.htm>

Describes how scientists have called for well thought out national and state-level policies regarding sea sand mining to understand their environmental consequences

Sand Mining Unabated along Cauvery

Article; by The Hindu; Bangalore; July 2006;

Available at <http://www.thehindu.com/2006/07/10/stories/2006071004880300.htm>

Describes how the unabated, illegal sand mining on the course of the Cauvery River continues, despite the ban on sand mining

Illegal Quarrying of Sand Detected

Article; by The Tribune; Chandigarh; June 2003;

Available at <http://www.tribuneindia.com/2003/20030604/punjab1.htm>

Describes how locals in Kasoor village in Dera Baba Nanak Development block on the Indo-Pakistan border have been complaining against illegal sand mining in the area

Illegal Sand Mining Posing Threat to Canal

Article; by Mahesh Sharma; The Tribune; Chandigarh; October 2005;

Available at <http://www.tribuneindia.com/2005/20051009/ldh1.htm>

Describes how the mining nexus between authorities and mining companies poses a threat to the Bathinda canal, where illegal sand mining continues unabated

Mining in the Niyamgiri Hills and Tribal Rights

Article; by Geetanjoy Sahu; The South Asian; USA; June 2008

Available at http://www.thesouthasian.org/archives/2008/mining_in_the_niyamgiri_hills.html

Describes how bauxite mining by the Vedanta Alumina Company is leading to conflicts with the adivasi population over water resources and other natural resources

Recommended Portals and Information Bases

Kali Bachao Andolan: Documentation, Environment Support Group, Bangalore (from [Bhargavi S. Rao](#), Environment Support Group, Bangalore)

<http://www.esgindia.org/campaigns/KBA/docs.html>; Contact Bhargavi S. Rao; Coordinator-Education Programmes; Tel: 91-80-22441977; bhargavi@esgindia.org

Describes the activities undertaken by the Environment Group to protect the Kali River from the effects of sand mining in the area

Recommended Upcoming Events

2009 AWRA Annual Water Resources Conference, USA, 9-12 November 2009 (from [Sunetra Lala](#), Research Associate)

Sponsored by American Water Resources Association, USA. Information available at <http://www.awra.org/meetings/Seattle2009/>; Contact Cleve Steward; Tel: 1-540-6878390; cleve.steward@amec.com

Will explore the multidisciplinary aspects of water resources research, policy and management, including water conflicts and how to resolve them

Related Consolidated Replies

Water Management Conflicts between Communities and External Actors, from Prema Gera, United Nations Development Programme, New Delhi (Comparative Experience). Water Community, Solution Exchange India and UNDP Energy and Environment Network,

Issued 18 December 2005. Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-global-18120501.pdf> (PDF, Size: 176KB)

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

Impact of Mining on Water Availability and Quality, from Pramel Gupta, Bhopal Rehabilitation, Bhopal (Experiences). Water Community, Solution Exchange India,

Issued 2 August 2007. Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-03070701.pdf> (PDF, Size: 200KB)

Provides members insights on adverse effects of mining on water availability and quality from across states and explains contextual complexities as well as the measures that could be adopted to address the issue.

Flood Induced Water Conflicts, from K J Joy, Suhas Paranjape and Shruti Vispute, Forum for Policy Dialogue on Water Conflicts in India, Pune (Experiences). 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: 162KB)

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

Conflicts over Drinking Water, from K. J. Joy, Suhas Paranjape and Shruti Vispute, Forum for Policy Dialogue on Water Conflicts in India, Pune (Experiences). Water Community, Solution Exchange India,

Issued 5 January 2009. Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-12110801.pdf> (PDF, Size: 167KB)

Inputs regarding actual cases of conflicts around drinking water, giving details of the location of the conflict, the conflicting parties, issues at stake, and present status.

Responses in Full

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

Mining induced water conflict relates to usage of groundwater stored in sand occurring in and around river beds and dunes along sea coast. While water users want sand to be protected from mining so as to extract groundwater within it, the industry needs sand to be mined for various uses. The magnitude of this conflict is not that high in environments where there is continuous generation of new sand by geological processes to compensate for the sand mined. Please read <http://www.solutionexchange-un.net.in/environment/cr/res-20030901.pdf> (DOC; Size: 20KB) for an article on "Groundwater Depletion in Papagni Catchment" by M. Chandrasekhara Rao published in "Water Conflicts in India" highlight how sand dams could be constructed to store much more sand in the river beds than what is mined and thereby resolve the conflicts between users of sand and users of groundwater available within sand. This solution is however not feasible in situations where new sand cannot be generated. I present below one such case.

Our work along Nellore coast in Andhra Pradesh has revealed that around one lakh years ago there was extreme global warming resulting in the large scale encroachment of sea into land. Because of later extreme global cooling (glaciation) and consequent lowering of sea water levels, the sea has now receded to the present level. As a result, a large stretch of coastal land once

under sea comprising of marine sediments with meagre salty groundwater and ancient dunes with abundant fresh groundwater has been exposed. These ancient dunes occur as a crescent-shaped band some 6 km away from the coast measuring 17 km in length, 2.5 km in breadth and 10 m in depth.

The villages where these dunes occur include Addepalli, Ballavolu, Chintavaram, Kanupur, Momidi, Thamminapatnam, Thurpu Kanupur, Vellapalem and Yeruru revenue villages in Chillakur mandal and Karlapudi, Kothapatnam and Siddavaram revenue villages in Kota mandal of Nellore district. Any rain falling in and around these dunes gets infiltrated to saturate sand with groundwater that surpluses as springs throughout the year. The spring discharge is collected by gravity flow into spring channels having an aggregate length of over 28 km to irrigate 1700 ha of land, besides feeding water into tanks to provide drinking water on a large scale.

Unfortunately, the Irrigation Department has no appreciation that groundwater within dunes is responsible for springs and their protection is needed for the sustainability of the spring discharge. They therefore protect the tanks and spring channels, but not the dunes. The Revenue Department has included the land occupied by dunes as wasteland not suitable for agriculture.

The quality of sand in ancient dunes is so high that there has been good demand for it as moulding sand. The Department of Mines and Geology at Hyderabad has granted 70 mining leases covering an area 998 hectares. Mining of silica sand is actively being pursued in 44 mines producing over 6.8 lakh tonnes of silica sand worth Rs. 3.4 crore per annum.

In tune with the policy of the Government of Andhra Pradesh to bring rapid industrial development through creation of special economic zones (SEZ), the area occupied by dunes is considered best suited for setting up industries. Large chunks of land occupied by dunes are already sold to private entrepreneurs for setting up industries.

Both the above activities result in drastic reduction in spring discharge from the dunes. In the larger interest of making available fresh water for both drinking and irrigation to the local people, there is to take appropriate steps to protect the dunes.

[Kuntala Lahiri-Dutt](#), Research School of Pacific and Asian Studies, The Australian National University, Australia (*response 1*)

This is an excellent initiative, many thanks for taking it up. Jointly with Fr Tony Herbert and Bina Stanis, I did a write up as a paper on water conflicts that I may be able to look up.

However, there is a lack of clarity in your description of mining that I would like to discuss in detail, probably not on this platform. In brief, you seem to be using 'conflicts' over resources as an overarching framework - there is a potential risk in the sweeping use of this particular framework. Seeing 'conflicts' in every case may hide important aspects of resource politics in which the more powerful gets the access to and control of the resources, and even the small & the poor may be represented as contributing to conflicts. I had written a paper on this in the Development Journal, the title would give away the content to at least the Bengali readers, 'May God Give us Chaos, so that we May Plunder'. A Google search by that title will definitely yield a pdf file of the paper from somewhere in the internet.

I am saying this because I noticed you have used all kinds of mining as one - there is a great need to understand & separate the more informal forms of mineral extraction by smaller operators from the large-scale, formal and capitalised forms of mineral extraction and processing (it is not this simple as a binary division, but for the time being, such a broad division can serve

as our starting point). It is the first kind of mining that has been put into the same category with the latter in your note, but I would suggest otherwise.

Not only are they different, informal mining practices need recognition as legitimate livelihood activity as well. For example, digging for diamonds in Panna or panning for gold in the Subarnarekha River might indeed have cumulative impacts on the environment, and definitely on water availability, but done by hundreds of poor men and women, these practices cannot be seen as the same with large open cut mines. Actually this kind of M&Q - often done seasonally - provides an important livelihood source, that as environmentalists we cannot deny. I have been thinking about this for some time - can I suggest the website www.asmasiapacific.org for a look? The site contains several case studies on such mining - primarily the livelihood aspects - that may throw some light on this matter.

In my view, in India we should start thinking about giving communities rights over mineral resources and acknowledge that such mining exists, and plays an important role in the economy. With rights, one can then consider giving the responsibilities for environmental care to the communities.

Coming to large-scale operations and their effects on water (& other environmental resources), again I would suggest that active participation by the community, and revenue sharing by them, would be a useful measure in bringing the voice of the local people on board to stop ruthless environmental destruction.

[Sunetra Lala](#), United Nations Children's Fund (UNICEF), New Delhi

Conflicts over the access to and control over natural resources, especially water, have aggravated in recent years owing to rising population, erratic rainfall and growing water shortages. At every level, these conflicts are exacerbated by lack of suitable frameworks, policies and mechanisms to govern use of water resources. One of the major causes of conflict is mining across the country.

The impact of mining on water resources is very pronounced in hilly regions, where it increases water runoff, decreases the potential of recharging aquifers. This causes an acute water shortage in the dry months. As mining decreases infiltration of water, it increases the surface runoff during the rainy season with a higher silt load. These affect water supplies and large hydel projects in the hilly areas. Thus, mining causes conflicts between local people and mining interests in these areas.

Another impact due to mining is the depletion of groundwater. Open cast mining and tunneling expose the aquifers and require groundwater to be pumped out, depleting this resource. As a result, the tubewells, dug wells and handpumps in surrounding regions run dry, affecting agriculture. In addition, tailings from the mines are dumped indiscriminately around the mines, contaminating groundwater and surface water sources. This causes serious problems for farming communities near mines. Many a times, people either oppose the mining, or migrate; both are manifestations of conflict as has happened in Chattisgarh, Jharkhand, Orissa, Madhya Pradesh and many other states.

The villagers that remain behind have no choice but to drink polluted water, and several minor conflicts flare up between them and the mining companies. The latter or the district administration resorts to supplying water through tankers and when these fail to turn up, local people are left high and dry; this is when protests and riots flare up. In all of this, women bear the brunt as they provide water for domestic use. Not only to do they have to walk further for potable water, they are more exposed to exploitation while going about their regular chores.

There are several cases of water conflicts over mining in **Orissa**, a state that is very rich in both minerals and biodiversity:

- Chromite mines in Orissa have caused severe health problems among people living downstream of the mines. The Regional Research Laboratory, Bhubaneswar, conducted a study that showed water from mines released into the Domsala River in the Sukhinda valley has badly affected the local people. The water from the mines is heavily laced with hexavalent Chromium that inflames the respiratory tract, causes nasal ulcers, dermatitis rhinitis, bronchospasm and pneumonia.
- Elsewhere in the state, farmers in the command area of the Hirakud dam have been slowly losing their water allocation to heavy industry. They say a quarter of their fields do not get any water as water diverted to industry has increased 27 times in the past decade. The industries include Hindalco and Vedanta, two companies mining for bauxite in the densely forested areas. Their mining activities have resulted in recurrent clashes between different adivasi groups in the Niyamgiri hills, populated by the Dongraria Kondh tribe.
- The adivasi women in Orissa launched the Save Gandhamardan movement to prevent BALCO from mining bauxite in the Gandhamardan hills in the 1980s. This was also affecting the Amar Kantak hills, the source of the Narmada River. Gandhamardan is a biodiversity hotspot with medicinal herbs, feed 22 streams and four waterfalls; it is an important watershed and mining would affect the water security of the entire area. The quantity of bauxite is much smaller than the economic loss due to the impact on the water resources.

In all these cases, the adivasis and other villagers have resisted mining companies for decades. They have organised themselves into movements to prevent access to the mineral rich areas, realizing that mining will destroy their natural resources and water, and impoverish them in the process. Organizations such as the Prakrutik Sampada Surakhya Parishad, Baphilimali Surakhya Samiti and the Anchalik Surakhya Samiti have led the adivasi movements.

In **Andhra Pradesh** too there are several cases of conflict between mining and local people, over water. The state has substantial mineral resources – 96% of India's reserves of barites, 40% of limestone and 30% of its bauxite. It has 16% of the country's mines covering 2, 00,000 hectares in the districts of Nellore, Kurnul, Nalgonda, Kadapa and Guntur. In 1980-2005, the state diverted 13,000 hectares of forests. This sparked confrontations between local people and miners in several places.

- In Nimmalpadu, the NGO called Samata has led an agitation for safeguarding water resources from being diverted for bauxite mining.
- In Nalgonda people are opposing uranium mines
- Another agitation is against the proposed refinery of the Jindal group at Boddavara and the Ras Al Khayma refinery at Makavaripalem

In **Karnataka**, there are long-standing protests against the Kudremukh iron ore mines that are situated in the catchment of the Tungabhadra River. In addition to affecting the river flow, the tailings from the mines wash into the Tungabhadra reservoir, polluting water and reducing the life of the reservoir.

In **Goa**, local people have protested, sometimes violently, against iron ore mining in north Goa between Honda and Usgaon. According to Professor Marathe of the Indian Institute of Technology, Mumbai, the groundwater levels have fallen by 0.28 m due to mining in this belt.

A very famous case of mining from the 1970s is from the Doon valley, **Uttarakhand**, in the Himalayan foothills. Limestone quarrying was rampant in these hills affecting the survival of people from the local villages, including Nahi Kala and Thano. Led by local NGOs and activists of

the Chipko movement local people protested and fought a legal battle up to the Supreme Court to stop the mines.

A more recent case is mining for stones in the Aravali hills in the Faridabad district of **Haryana**. This has completely destroyed the watershed of this semi-arid region, and as a result, several large lakes have dried up. This has affected the groundwater levels in the area bringing down agriculture. The mine owners claim theirs' is a critical activity for supplying building material to Delhi while local people say their water resources have been depleted. The mining has intercepted the natural flows into these lakes. This is a case where mining interests have clashed with city dwellers and villagers.

For more such case studies please read:

1. Ecology and the Politics of Survival by Vandana Shiva
2. Profits over People, Ali Kishore Patnaik, Frontline, Volume 18, Issue 1, 6 – 19 January 2001
3. Negotiated Transactions as Conflict Resolution Mechanisms: Water Bargaining in the U.S., K. William Easter, Mark W. Rosegrant and Ariel Dinar, Springer US
4. Depletion of freshwater in the mining regions of Goa, India: Gendered impacts and responses, Multiple Dimensions of Global Environmental Change, S. Sonak, TERI Press, New Delhi pp. 650 – 673.

For information pertaining to conflicts over **sand mining** in India, I request members to please read:

1. Mining dangers, S. Viswanathan, Frontline, Volume 19 - Issue 10, 11-24 May 2002 (please visit <http://www.hinduonnet.com/fline/fl1910/19100440.htm>)
2. Sand mining: Middle men make merry, G.D. Belgaumkar, The Hindu, 25 May 2005. (please visit <http://www.hindu.com/pp/2005/06/25/stories/2005062501040100.htm>)
3. Sand extraction from agricultural fields around Bangalore: Ecological disaster or economic boon?, Rajendra Hegde, S. C. Ramesh Kumar, K. S. Anil Kumar, S. Srinivas and V. Ramamurthy, Current Science, Vol. 95, No. 2, 25 July 2008 (please visit <http://www.ias.ac.in/currsci/jul252008/243.pdf>; PDF, Size: 80KB).
4. Impact of sand mining on local ecology, Multiple Dimensions of Global Environmental Change, S. Sonak, TERI Press, New Delhi, pp. 101 – 121.

Mining cannot be truly environment-friendly because all ore bodies are finite and non-renewable and even the best managed mines leave "environmental footprints". However, mining is necessary and therefore should be a consultative process. Before commencing, there is a need to mandate an impartial environmental impact assessment, ban mining in forest land and frame stronger mine closure regulations.

Panchayats need to be given a greater say in mining contracts on their land as this affects the survival of the people. Access to water and control over it is not only a matter of survival but an issue of democratic participation of all citizens in the management of their country's natural resources, particularly as conflicts over water increase. Effective conflict resolution calls for a consensual and multi-stakeholder effort. Today, the key challenge before water resource governance is the need to balance economic growth with the needs and ambitions of all sections of society, the future generations and the environment.

[Bhargavi S. Rao](#), Environment Support Group, Bangalore

The Environment Support Group (ESG) has been working in the area of Dandeli in Uttara Karnataka region where the Kali River is facing severe threats from sand mining, in addition to discharge of untreated effluents from the West Coast Paper Mills - its recent plans of expansion,

and the threat of a proposal surfacing again to build one more dam. ESG has focused its efforts in stopping the pollution from the paper mill but has documented the other issues in the region.

A dossier on the illegal sand mining at Kali and A Memorandum presented to the then Chief Minister of Karnataka, Sri S.M. Krishna bringing it to his notice is enclosed. More information on the Kali River is available at <http://www.esgindia.org/campaigns/KBA/docs.html>. I also request members to please visit <http://www.solutionexchange-un.net.in/environment/cr/res-20020902.doc> (DOC; Size: 32KB) and <http://www.solutionexchange-un.net.in/environment/cr/res-20020903.doc> (DOC; Size: 48KB) for more details.

Muhammad Mukhtar Alam, Centre for Ecological Audit, Social Inclusion and Governance, New Delhi

Mining is considered integral for the mode of ecologically hostile non-renewable resource based habitats, consumption, and production and transport productions. We personally, collectively and as a nation need to get rid of this urge for expansion of ecologically hostile habitats for halting mining everywhere. There has been much critique but then we remain somehow oblivious to the demands of ecological safety. Centre for Ecological Audit, Social Inclusion & Governance (CEASIG) is proposing a new discipline called *ecostrategics* for getting convergence in actions across the boards for securing distributive justice for renewable resource based livelihood, habitats and consumptions. Our position for multiplying carbon-neutral neighbourhood discussions/consultations across the cities and villages can be seen in this light as we need ecological audits for all our consumption decisions and energy use patterns.

Kuntala Lahiri-Dutt, Research School of Pacific and Asian Studies, The Australian National University, Australia (*response 2*)

One area of great relevance is the connections between water and women/gender and mining. The negative impacts of mining on water have important gender dimensions. Both the quality and the quantity of water are grossly affected by mining - for example, in both open cut & underground mining, the water table falls drastically. Obviously physical proximity to the mines is positively correlated with such a lowering. Often this lowering of water table is not reflected in the data from reading, which are taken by specialists from given 'boreholes' that are located far away from the mine sites. Water quality is an area that receives some importance to mining engineers - there is in fact an 'international journal on mine water quality', but it says nothing on gender-specific issues. By law, the mining companies are, in some countries, bound to treat their effluent before dumping the waste & polluted water back into the system (although how much of that actually happens is anyone's guess). But there are many other aspects of impacts on water: for example, changes in river regimes due to excessive sedimentation into the rivers from upland erosion comprise an area that has almost no literature and information. These changes may influence local ecology and plant & fish communities downstream, and may affect the availability of food for women who often are responsible for collecting such flora and fauna.

To me, women's access to safe and adequate water sources for their daily domestic and productive chores is an essential part of their well-being. Poor water or lack of adequate water impacts on women's lives more negatively than they do on men's lives. The reason is well-known: in most communities, the roles of women and men are different, and who does what is determined by sex. Women care for the household subsistence, care for the elderly and the children, produce household crops, collect water and do water chores. Women, water and mining is an area where more research and activism is needed: on the impacts on water availability and water access, and on what can be done to improve the situation. First of all, I would think that women must be part of any community consultations and any public hearings, and voice these

concerns. Secondly, I would think of separate compensation for land and water. In many countries, water is seen as part of the land and is not compensated separately for by mining companies. Slightly different, but similar, is the issue of customary water rights over natural sources of water. Often women use these water sources also as social points of meeting. Third I would think the adequate and safe water supply should be made a part of the commitment that a mining company makes before leasing the land or getting a contract of work. Fourth, in developing water supply and sanitation projects, there has to be a 'gender lens' put on by mining company professionals.

[Himanshu Thakkar](#), South Asia Network on Dams, Rivers and People (SANDRP), New Delhi *

I came across the following article which may be of interest for this query:

Illegal mining goes unchecked

Nurpur, March 15 2009

The local unit of the Bharatiya Kisan Sangh (BKS) has taken exception to the alleged illegal and unscientific mining on the Chakki rivulet in the Khanni area with impunity. The BKS in its meeting held at Zikli Khanni gram panchayat recently, which was presided over by its president Baryam Singh, rued that due to scanty rains the underground water-level had come down.

The illegal quarrying had also brought down the underground water-level resulting in drying up of kuhals, wells and hand pumps. They also held unscientific mining in the rivulet responsible for collapsing of irrigation schemes in the area. The BKS also expressed its resentment over the alleged silence of the state Mining Department and local administration over the unabated illegal mining in the area. They also gave an ultimatum to them to curb the menace within one week otherwise the BSK would launch dharna and block traffic. The BKS had also demanded stern action against the mining mafia and conserve environment and underground water resources in the area.

[S.V.R.K. Prabhakar](#), Institute for Global Environmental Strategies (IGES), Japan*

The issue is very much pertinent and it is more relevant in coal mining areas and areas where soil has been excavated for brick making purposes as well. I must admit that my expertise and knowledge doesn't fall in this specialized problem area and my expertise and experience is mostly in drought risk mitigation.

However, I do see there is tremendous scope in resolving the issues related to mining and resource deprivation of local communities by putting in place following policies/measures:

1. First and foremost, mandating payments to local communities/groups by estimating the cost of replenishing potable water supply from nearby perennial source and making sure that the water is made available to them by putting in place water supply systems before the project is taken up.
2. Secondly, and in combination with the above, mandating provision of certain employment and capacity building related benefits to local communities by those involved in mining
3. Restricting mining activities in dark zones (areas delineated as critically low in ground water)
4. Mostly mining related resources are dealt by the individual states and central government has no role in it. This has made several states to have different kinds of laws and

- regulations making certain states as heavens for mining. This has greatly undermined the environment and social benefits in these 'mining heavens'. I would suggest that the above guidelines should be incorporated in the state level regulations before sanctioning any kind of clearance for mining.
5. Gram panchayats and other Panchayat Raj institutions should be given authority to negotiate the resolution directly with direct benefits to the communities in question. They should represent in local conflict resolution committees established if any and work closely with the traders to avoid such conflicts.

I hope these thoughts would help to a certain extent.

**Offline Contribution*

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: Mining Induced Conflicts Over Water - Experiences; Examples. Additional Reply."

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