Arsenic
Knowledge and Action Network

Newsletter
Volume 2, May 2014

A pisciculture (fish farming) pond in Ghetugachi village, North-24 Parganas district, West Bengal. Ghetugachi is affected by chronic groundwater arsenic contamination. Ponds like these were once a major source of drinking water here, but today, they either lie dilapidated or are used purely for fish farming. Total dependence on ground water for their drinking needs accelerates their free fall into the 'depths' of this fatal public health disaster.

Dear Friends,

Greetings from the Arsenic Knowledge and Action Network!

After a long gap, we bring out the second volume of the Arsenic Network Newsletter. Since the last volume of the newsletter, the Network has gone deeper into understanding the arsenic issues in Assam. We have had meetings with the PHED and Health Department in Assam and have also interacted closely with the academic circles there. Mr. A.B. Paul (Retd. Chief Engineer, PHED) helped us greatly in connecting with people and identifying issues from the ground. We now see Assam as one of the regional hubs for Network activities in the future as will be illustrated though the activities marked out in detail in this newsletter. Further, we do have plans to expand the work of the network to other areas like Bihar, West Bengal, Uttar Pradesh, etc. For furthering the Arsenic Networks agenda within your state for possible knowledge, action or advocacy interventions, please do get in touch with us.

As we had mentioned previously, we look forward to contributions from the readers and other network members for the coming issues. This newsletter brings out some of the first contributions which are from Aditi Mukherjee (ICIMOD, Kathmandu) and Nari Senanayake (IWMI, Colombo) as they review 34 papers that explore the interventions aimed at reducing the negative impact of irrigating with Arsenic rich water. Also contributing to this issue is Alok Kumar Yadav, a student from the Tata Institute of Social Sciences who worked under the guidance of Prof. Anirban Gupta from Indian Institute of Engineering Science and Technology (formerly Bengal Engineering and Science University), Shibpur in trying to understand the working of the AMAL Arsenic Removal Units (ARUs) in West Bengal. Alok gives a brief account of the AMAL filters, and mentions its strengths and the challenges it faces. As the newsletter grows we look forward to contributions coming from various other researchers, practitioners and enthusiasts in the future. Do get in touch with us if the urge to contribute strikes you!

The newsletter is an attempt at keeping you all abreast with the Network activities and we look forward to your views on this edition.

Editorial Team
Arsenic Network Newsletter

Arsenic Information Portal

An online platform for information curation and sharing was observed as an essential requirement. In an attempt at providing this platform we have developed a network website. We welcome you to the first cut which is available online at **http://www.saciwaters.org/arsenicnetwork** and request members to suggest improvements and gaps in the website so that your interactions within it can be made better and more meaningful.

State of the Sector Report on Arsenic in India

The State of the Sector Report is an idea that was floated during the network inception meeting in October with the realisation of a critical need for a one-point source for all information regarding Arsenic.

The State of Sector Report will present a coherent amalgamation of information/practices/literature pertaining to Arsenic in the context of India. The report will not only comprise of the existing mitigative technologies, but also social actions, community mobilizations, institutional structures, policy based measures, training and capacity building activities and health focused/academic research. In short, this document aims to be a point of reference for experts, researchers, policy makers and practitioners in the field of Arsenic in India. These are some suggestions on what the report could include. We would request network members to help us with contributions, suggestions or ideas.

Considering the magnitude of this task, we thought it would make sense to take a state-wise approach and then assimilate these to form a combined report. The first steps towards this report have been initiated within Assam. Mr. A B Paul (Retd. Chief Engineer, Assam PHED) has helped us initiate this process and we are working on the building the Assam report with help from other network members as well.

The network requests and encourages members from other arsenic affected regions and also Assam to come forward and contribute to this exercise and make the report as substantive as possible. This task hinges on contributions from experts and practitioners from across the country.

Internships

Two M.Sc. students from TISS, Mumbai (Alok Kumar Yadav and Vijay Ganesh) were engaged as interns in partial fulfilment of their course requirements and did field work in arsenic affected areas in Assam and West Bengal. Outputs were in the form of case studies documenting the community coping mechanisms in Assam and the implementation of AMAL filters in West Bengal. The Network secretariat is working on the case studies and will be shared publicly soon. Also shared on the network website and the network blog will be a reflection on the field visit to Assam and West Bengal.

Irrigating with Arsenic Contaminated Groundwater in the Bengal Delta: A review of mitigation options

Aditi Mukherjee (ICIMOD, Kathmandu) and Nari Senanayake (IWMI, Colombo) conduct an extensive literature review of 34 papers that explore and study interventions aimed at reducing the negative impacts of irrigating with Arsenic rich water.

"We looked at two distinct, but related aspects" Aditi writes in her blog. "Firstly, at the consequences of irrigating with arsenic rich groundwater where we reviewed 27 high quality studies and found that irrigating with arsenic rich water leads to accumulation of the same in soil, but not necessarily accumulation in crop parts in equal severity. The review indicated that such accumulation depends on crop types and water management practices. But what was evident was that irrigating with arsenic rich water for long periods almost always led to decline in yields" she explains. Aditi explains the second aspect the study looked at when she says "we looked at ways of mitigating the negative impacts of irrigating with arsenic rich water. 29 studies were reviewed with experimental design and found that there are at least 6 categories of interventions that have been tried and tested in the field or in the laboratories. And the good news is that most of these work, but work with varying degrees of success."

Paper in Agricultural Water Management http://saciwaters.org/arsenicnetwork/pdfs/AGWAT3823.pdf
Working paper for IWMI (2012) http://iwmi-tata.blogspot.in/2012/11/2012-highlight-12.html

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Research on arsenic - nutrition linkages

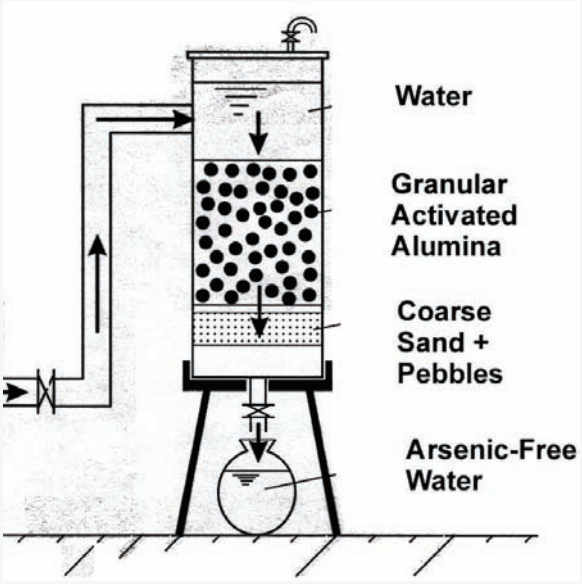
Nutrition and its role in reducing the susceptibility to arsenic toxicity has been an issue of concern in academic circles. While these linkages have been studied in the past, there remains a significant gap in terms of conclusive evidences, from the experimental and empirical lenses. There is also a very real possibility of converting this knowledge into action through interventions based on nutritional intake that can help offset the accumulated health impacts of arsenic toxicity. With this logic, we propose to conduct a study in the arsenic exposed parts of West Bengal and Assam on the stated issue, attempting to identify locally available food items that will be able to meet the nutritional requirements required to offset the impact of arsenic toxicity.

We have already contacted network members Ms. Suneetha Sapur and Prof. Kunal Kanti Majumdar with this research idea and we will be contacting more experts. We request researchers, academicians, and practitioners to contribute with their knowledge and experience to this well meaning exercise, aimed at bringing about a positive change in the lives of arsenic affected populations.

AMAL Arsenic Removal Units (ARUs), West Bengal - Alok Kumar Yadav

Development of short and medium term mitigation measures for arsenic contamination in groundwater in Bengal basin is essential. While surface water sources are seen as the most effective mitigation measure, development of large scale surface water sources as an alternative is a process that requires time and large scale community mobilization.

Indian Institute of Engineering Sciences and Technology, Kolkata, India in collaboration with Lehigh University, USA has installed more than 200 Arsenic Removal Units (ARUs) in various spaces around West Bengal called AMAL. Design and operation of unit is shown in the schematic diagram below.



Management of AMAL Units:

Water committees are formed in the villages by volunteers who manage the units. Small amount of tariff is collected (10-20 rupees) by the committee for maintenance and upkeep of the units.

Benefits:

- For short term mitigation measures, this can be an effective option.
- Approximately 2 lakh people are risk free from arsenic poisoning.
- Creation of additional employment (caretakers, water collector, plumber, water-container seller etc.)
- Reduction in drudgery for collecting water from safe sources.
- Awareness level of the community has improved in areas where these units are installed.

Challenges:

- There is minimal government involvement, hence dependency on donor agencies.
- Management of the ARUs is dependent on the involvement of local volunteers. Places where community cooperation is less (for various reasons), sustainability of these units is an issue
- The monthly tariffs are a de-motivating factor in many communities as has been evidenced through discussions on the ground

Compendium of Case-studies

In spite of the extensive research on arsenic, considerable gaps remain in cross-regional learning and linking of success stories into scale-able policies or mitigation strategies. The arsenic discourse has also largely remained techno-centric without appropriate inclusion of community voices, leading to socio-economic exclusions in actions and policy. In an attempt to bring out these voices and stories, we have planned to come out with a Compendium of Case Studies from across arsenic affected regions in India. To this end, we will soon be inviting abstracts on specific themes. It would be good to have practitioners contribute to this compendium and achieve the stated objective.

Arsenic Trivia

Arsenic is often used as a part of extremely diluted homeopathic remedies for digestive disorders, food poisoning, insomnia, allergies, anxiety, depression, and obsessive-compulsive disorder (OCD). Number of published studies - in India and outside - have highlighted cases in which homeopathic remedies cause clinical arsenic toxicity and have concluded that arsenic used therapeutically in homeopathic medicines can cause clinical toxicity if the medications are improperly used.

The medicines don't usually contain information of the possibility of arsenic contamination. It would make sense then to keep oneself aware of the contents of homeopathic remedies by asking for information from the clinician and make an informed choice.

Click for some further reading: Posadzki et. al. 2012, Amster et. al. 2007, Chakroborthi et. al. 2003

Bottled/Canned water sale in North-24 Parganas. The challenges of quality control and commodification of a common property resource spreading its wings in rural areas is a matter of grave concern.

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