

## Of Water Woes and Some Quiet Japanese Work

**PROJECT:** EXECUTION OF ARSENIC MITIGATION PROJECT FOR ESTABLISHMENT OF GOVERNMENT INITIATIVE SYSTEM IN UTTAR PRADESH

**PROJECT PERIOD:** PHASE I (2008-2010) & PHASE II (2011-2013)

It's a warm October morning and the district hospital at Bahraich is teeming with patients. But the crowd is not lined up as all days to meet the doctors. Instead they are huddled in a group outside the ward, closely watching a family row as loud shouts fly about.



An onlooker may almost get fretful till it dawns that the heated dispute is part of a street play. *Kaluey ki Maa* (Kalua's Mother) is a much harried woman, bothered by several skin problems. She has strange discolorations and thickening on her skin. Now even her husband is complaining he has the same problems.

*A local street play enlightens the crowd about arsenic. Photo credit: Poorva Sagar/ OneWorld*

At a loss, the couple decide to seek help from the local medicine man. Just then the husband's cousin comes along and explains that their skin problems may well be symptoms of 'slow poisoning' by arsenic in water.

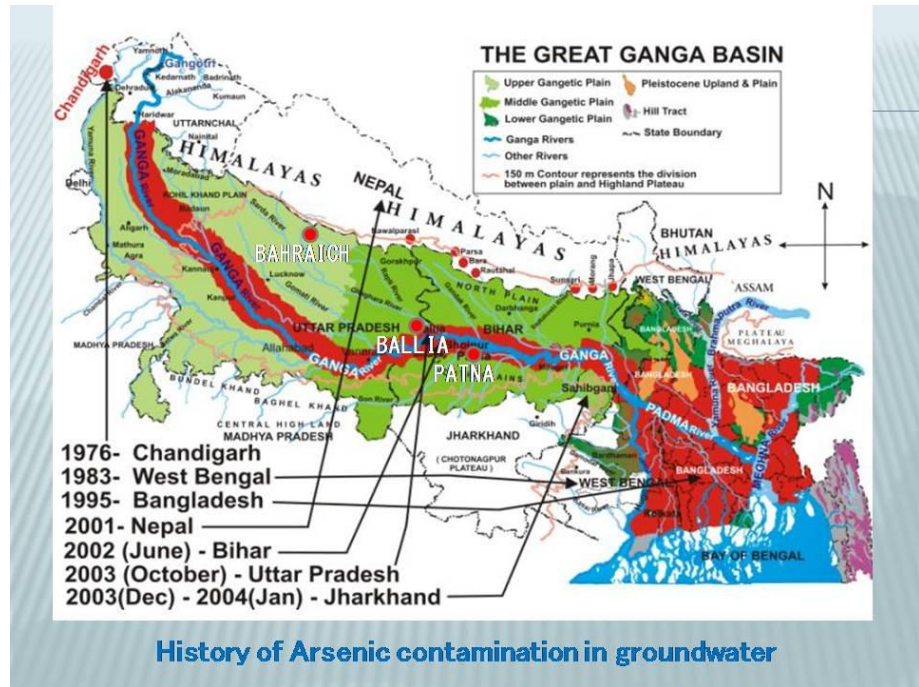
The audience, so far amused by the performance, is now curious and questioning about the matter of arsenic. As the play ends, some volunteers move among the crowd and distribute pamphlets. It's all in a day's job for the **Bahraich Arsenic Mitigation Project** (BAMP), which is on an awareness drive to educate locals on the ill health effects of arsenic contaminated water.

BAMP is a first-time, non-government intervention in arsenic mitigation in the northern Indian state of Uttar Pradesh. The project operates in 34 habitations in two villages – Chhetra and

Newada in Tejwapur block in Bahraich district. Supported by the Japan International Cooperation Agency (JICA) under their JICA Partnership Programme, the project was first launched in 2008 by the University of Miyazaki, Japan in collaboration with Kanpur based local environmental NGO Eco Friends.

### An integrated approach

High prevalence of arsenic in the populous Ganges River belt (*see map*) was a major reason for the project's focus on Uttar Pradesh. Bahraich was selected following a state water survey by the UP Jal Nigam that revealed the district, with 10 of its 14 blocks, as the most widely arsenic contaminated – Tejwapur block being the most affected.



The University of Miyazaki's wide experience in arsenic mitigation in Bangladesh with the Asia Arsenic Network was a strong driving force behind the project, guided by the able senior Professor Hiroshi Yokota as the Project Lead.



BAMP's success lies in its broad programme activities that provide an integrated approach to project implementation. In the first phase, every water source was screened – both private and government – in initial seven hamlets in the two villages. Hand-pumps with arsenic concentration above 50 PPB (parts per billion) were marked red as unsafe, while those less than 50 PPB were marked green as safe.

*A tube well marked red to notify unsafe water. Photo credit: Madhusmita Hazarika/ OneWorld*

“The 50 PPB level was undertaken only as an interim measure owing to the wide prevalence of high arsenic levels,” says Rakesh Jaiswal, President of Eco Friends. “The WHO and BIS standards prescribe 10 PPB as the maximum limit of arsenic concentration in the context of safety of human health,” he clarifies.

However a lack of knowledge on arsenic meant the color codes were not taken seriously by the villagers. A household survey revealed that out of a population of near 1,600 in the seven habitations, almost 740 people were drinking arsenic-contaminated water above 50 PPB.

To tackle this risk, the project roped in villagers to form Arsenic Mitigation Committees (AMCs) at the village level. A study tour to Bangladesh was organised for the BAMP staff and village community representatives to learn more about the health impacts of arsenic poisoning.

Importantly, BAMP offered an alternative option to their water source in the form of Safe Water Devices (SWDs). Designed and set up by University of Miyazaki, the SWDs are locally-suited water filters – the Gravel Sand Filters (GSFs) attached to hand pumps, and Dug Well Filters (DWFs) set up on wells. These filters use locally available material, and offer an eco-friendly option to access arsenic-free water devoid of high energy inputs.

BAMP also trains AMCs on the use and upkeep of the filters, so these eventually become community-owned and operated facilities.



*In Phase I of the project, 8 Gravel Sand Filters (left) and 3 Dug Well Filters (right) were built. Photo credits: BAMP*

**INSERT VIDEO** (*Piyush Jaiswal, Executive Secretary, Eco Friends explains the functioning of the Gravel Sand Filter*)

Following BAMP’s example on SWDs, the state government has stepped in with its efforts, and has set up near 800 Activated Alumina Filters (AAFs) to provide arsenic-safe water in the entire district.

“The government planted many safe water devices in villages but people are not using them. Our main activity is to make people aware of arsenic,” says Yasunori Yano, Deputy Project Manager, BAMP and Assistant Professor of Miyazaki University.

The second phase of BAMP, begun in early 2011 in 27 more hamlets, aims to execute the Arsenic Mitigation Project in active partnership with the UP government by focusing on awareness generation and ensuring effective use of the arsenic filters set up by both BAMP and the government. A step forward has been the formation of AMCs at the block and district levels.

Yano is hopeful that the project would succeed in changing people’s attitudes and practices towards safe drinking water.

**INSERT VIDEO** (*Yasunori Yano, Deputy Project Manager, BAMP shares on arsenic awareness*)

### **Working with doctors**

The Gravel Sand Filter at Dhannipurwa habitation in Newada village is a popular spot for the locals. Village kids play nearby in the hot sun, and rush to the filter for a quick drink. When asked about arsenic, they clamor to show off their knowledge.

“We can get blisters if we drink arsenic water,” yells out a boy, as he is playfully shoved by another who says, “We must only drink water from the hand pump filter.”

“This is our village filter, so we all look after it,” says a third quickly. The water is good to drink, they all agree. It is evident that most villagers know why the filter has been set up.

**INSERT VIDEO** (*Farmers’ testimonies on using the Gravel Sand Filter*)

While Dhannipurwa is a success story, there are instances where the filters have not been able to achieve their expected uptake in the community – a major factor being the poor knowledge on arsenic poisoning due to no proven cases of arsenicosis.

While Bahraich is widely contaminated, its arsenic concentration (a maximum of 250 PPB) is much lower than that of its neighbouring districts Baliya and Ghazipur, where high levels of 1,000 PPB have been reported. This regrettably lessens the gravity of the issue among the people. The project therefore took help from doctors from Primary Health Centres (PHCs) to conduct health examination camps in the villages and boost arsenic awareness.



Dr Chandrabhan Yadav, Medical Officer-in-Charge at the PHC in Tejawapur block, has been closely associated with BAMP and agrees that the project has given a push to knowing a risk that was earlier missed.

*Dr Yadav and others from the medical fraternity ensure their patients are informed on arsenic. Photo credit: Poorva Sagar/ OneWorld*

“Earlier our knowledge of arsenicosis was largely limited to literature,” he shares. “In 2008, BAMP organised an orientation on arsenic for doctors that informed us in detail about its pathology, diagnosis, treatment and scientific management.”

“Doctors today include arsenicosis as a possible cause when we see skin problems like melanosis or keratosis. Like BAMP, we also tell our patients to drink water only from arsenic-free filters,” adds Dr. Yadav.

### **Making the message clear**

“Sharmila and Piyush visit us regularly to tell us about arsenic,” says Satyawati, a housewife from Dhannipurwa. “It is only because of their repeated lessons that we have understood its risks. Now we drink filtered water only,” she acknowledges.

Satyawati’s neighbour Pushpa Awasthi has seen blisters getting cured by switching over to arsenic-free water. “We care for our and our children’s health. We are not going to use water from the red hand pumps anymore,” she says.



Sharmila Rai, a field officer with BAMP, drives community advocacy through word-of-mouth information, presentations and in-school promotions with children.

*Sharmila uses a flipchart to make her message clear on arsenic poisoning. Photo credit: Poorva Sagar/ OneWorld*

“At schools we use PowerPoint presentations to teach children about arsenic and its risks in a fun way. Till now we have covered 12 schools in Newada. We also make presentations in the village in the evening when the men folk return from work,” says Rahul Jaiswal, Sharmila’s co-worker.

Women are addressed separately in most instances. “I talk to women during the day time,” says Sharmila. “I use flipcharts with pictures of arsenicosis patients so that they can easily understand its risks. Most women take time to respond. They share their problems only later when they open up.”

Sharmila and Rahul’s sustained efforts are slowly yielding results. The presence of BAMP is now recognised in the villages. People know about arsenic, they know about the filters. The biggest achievement is however changing the mindsets of people such as Satyawati and Pushpa towards safe drinking water.

### **Benefiting environment, improving hygiene**

In its second phase, the project has also focused on constructing a Model Biogas Plant that will improve village hygiene and provide a substitute to domestic fuel.

The underlying thought is that better sanitation behavior will translate into better usage and maintenance of the village water filters.

Presently under construction in Dhannipurwa, the plant is slated for completion by the end of 2011. Md. Mizbaul Islam, Technical Assistant, BAMP explains its unique feature, “The above-ground biogas plant will maintain a constant temperature – so that gas production remains stable even in winter. This will tide over the



1 The Model Biogas Plant is a set up with four tanks, placed over ground. This enables temperature control in the system for steady production of biogas all year round.



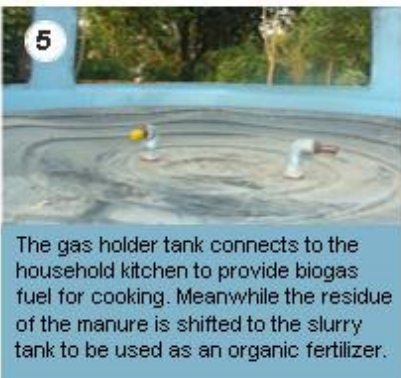
2 The first tank is the fermentation tank. Cattle manure is fed into it through an inlet.



3 The fermentation tank has an outer water jacket that circulates solar heated water to maintain an ideal temperature for working of anaerobic bacteria.



4 The manure in the fermentation tank gets stirred by a pump to avoid settlement, and for thorough decomposition. The decomposing manure then produces biogas, which is moved to the gas holder tank.



5 The gas holder tank connects to the household kitchen to provide biogas fuel for cooking. Meanwhile the residue of the manure is shifted to the slurry tank to be used as an organic fertilizer.

disadvantage of the conventional underground biogas plant in which gas production decreases with reduction of temperature in winter.”

Having come a good way in establishing a first-of-its-kind intervention in arsenic mitigation, the Bahraich Arsenic Mitigation Project envisions the work it has started will set an example for the future.

Rakesh Jaiswal sums up the vision, “We want the government to further our precedent on integrated arsenic mitigation, and we expect more roles in future for the state, district and local governments for mitigating arsenic.”

As BAMP deepens its community engagement, and seeks to build stronger stakeholder partnerships to take forward its dream, its quietly committed Japanese efforts reflect an image of healthier and happier lives.

**INSERT VIDEO:** *(Rakesh Jaiswal, President, Eco Friends, shares the future plan of BAMP)*

**END**