

## Million dollar arsenic removal plants in West Bengal, India: Useful or not?

M. AMIR HOSSAIN,<sup>1,2</sup> AMITAVA MUKHARJEE,<sup>1</sup> MRINAL KUMAR SENGUPTA,<sup>1</sup> SAD AHAMED,<sup>1</sup> BHASKAR DAS,<sup>1</sup> BISHWAJIT NAYAK,<sup>1</sup> MOHAMMAD MAHMUDUR RAHMAN,<sup>1,3</sup> AND DIPANKAR CHAKRABORTI <sup>1,\*</sup>

*School of Environmental Studies, Jadavpur University, Kolkata 700 032, India.*

\*Corresponding author:

Director and Head

School of Environmental Studies, Jadavpur University, Kolkata – 700 032, India.

E-mail: [dcsoesju@vsnl.com](mailto:dcsoesju@vsnl.com). Website: [www.soesju.org](http://www.soesju.org) phone: +91 – 33 –

24146233; Fax: +91 – 33 – 24146266;

<sup>1</sup> School of Environmental Studies, Jadavpur University

<sup>2</sup> Institute of Statistical Research and Training, University of Dhaka, Dhaka 1000, Bangladesh (on leave).

<sup>3</sup> Present address: Centre for Environmental Risk Assessment and Remediation, University of South Australia, Mawson Lakes Campus, SPRI Building, Mawson Lakes, SA 5095, Australia

### Abstract

The effectiveness of arsenic removal plants (ARPs) as a remediation approach to provide safe water was evaluated based on our systematic study of 577 ARPs installed in 3 districts out of 1900 total ARPs installed in 5 arsenic affected districts of West Bengal, India. Out of 577, 145(25.1%) were found defunct. Both raw and filtered water from 305 ARPs were analyzed for arsenic. Forty-eight ARPs were installed despite raw arsenic concentration below the Indian standard (50µg/L). Among the 264 ARPs having raw arsenic above 50µg/L, 140(53.1%) and 73(27.7%) failed to remove arsenic below the WHO guideline value (10µg/L) and Indian standard, respectively. The highest arsenic concentration in filtered water was 705µg/L. Analysis of 217 treated water samples for iron showed, 175(80.6%) failed to remove iron below 300µg/L. The treated water became colored on standing for 191(44.2%) ARPs and 25(5.8%) were producing bad-odored water. Overall study showed that 475(82.3%) of the ARPs installed in the arsenic affected areas were not useful. The reasons for ineffectiveness and low performance included improper maintenance, sand gushing problem, lack of user friendliness and absence of community participation. A comparative study of ARPs in two different blocks Domkol in Murshidabad district and Swarupnagar in North 24 Parganas showed that 39(80%) and 38(95%) ARPs, respectively, were not useful. Our micro-level study in a Gram Panchayet Kolsur, Deganga block, North 24 Parganas showed that 14(87.5%) ARPs were not useful. High urinary arsenic there indicated that despite installation of ARPs villagers were consuming contaminated water. A proper watershed management with active participation from the villagers is urgently required.