

Ineffectiveness and Poor Reliability of Arsenic Removal Plants in West Bengal, India

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Abstract

In the recent past, arsenic contamination in groundwater has emerged as an epidemic in different Asian countries like Bangladesh, India and China. Arsenic removal plants (ARP) are one possible option to provide arsenic-safe drinking water. This paper evaluates the efficiency of ARP projects in removing arsenic and iron from raw ground water, based on our two-year long study covering 18 ARPs from 11 manufacturers, both from home and abroad, installed in an arsenic affected area of West Bengal-India, known as the Technology Park Project (TP project).

Immediately after installation of ARPs on August 29, 2001, the villagers began using filtered water for drinking and cooking even though our first analysis on September 13, 2001 found that ten of 13 ARPs failed to remove arsenic below the WHO provisional guideline value (10 microgram per liter), while six plants could not achieve the Indian standard value (50 microgram per liter). The highest concentration of arsenic in filtered water was observed to be 364 microgram per liter. Our two years study showed that none of the ARPs could maintain arsenic in filtered water below the WHO provisional guideline value and only two could meet Indian standard value (50 micro gram per liter) throughout. Standard statistical techniques showed that ARPs from the same manufacturers were not equally efficient. Efficiency of the ARPs was evaluated based on point and interval estimates of the proportion of failure. During the study period almost all the ARPs have undergone minor or major modifications to improve the performance and after our study, 15 (78%) out of 18 ARPs were no longer in use. In this study, we also analyzed urine samples from villagers in the TP project area and found 82% of the samples contained arsenic above the normal limit.