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Author(s): PADMAPARNA GHOSH

Date: Jan 15, 2006

Soaps, tubewells are causing arsenic contamination



"Because of the lack of any regulation for the soap and detergent industry, the presence of arsenic in soaps goes unchecked and this is highly dangerous," said Sabyasachi Sarkar, one of the authors of the study.

The researchers tested the water and soil around tubewells in Kanpur. They found washing of clothes and bathing leads to formation of

stagnant pools near tubewells. The accumulated water aids the growth of blue-green algae, which covers the surface of the pools, creating an anaerobic environment. Oxygen-poor conditions, in turn, encourage the growth of sulphate-reducing bacteria (SRB), which thrive on the readily available sulphates and fatty acids from soaps and detergents. These biogeochemical reduction and oxidation reactions require a stagnant pool of water, which is why the arid parts of India do not face this problem.

"A proper drainage system with a good flow of water may prevent local accumulations of food sources (sulphates and fatty acids) and the necessary anaerobic conditions for growth of these microbes," says Sarkar.

The metabolic activities of SRB generate hydrogen sulphide gas, which releases any bound arsenic in the soil. "Not only that but the arsenic in the soaps themselves seeps into the aquifers underneath, contaminating surface water and groundwater in surrounding areas. We found that all the soaps freely released arsenic into surface water," says Sarkar. "As phosphates can assist algal growth, its usage is restricted in many countries, but not in India," he adds.

The study emphasises the need for proper drainage and maintaining hygienic conditions around tubewells in the country as well as manufacture of arsenic-free liquid soaps and detergents to prevent the release of arsenic into the environment.

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