

## **Arsenic calamity in the Indian sub-continent. What lessons have been learned?**

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### **Abstract**

Groundwater As contamination in West Bengal (WB), India was first reported in December 1983, when 63 people from 3 villages of 2 districts were identified by health officials as suffering from As toxicity. As of October 2001, the authors from the School of Environmental Studies (SOES) have analyzed >105,000 water samples, >25,000 urine/hair/nail/skin/vegetable samples, screened ~100,000 people in WB. The results show that more than 6 million people in 2700 villages from 9 affected districts (total population ~42 million) of 18 total districts are drinking water containing  $\geq 50 \mu\text{g l}^{-1}$  As and > 300,000 people have visible arsenical skin lesions. The As content of the physiological samples indicate that many more may be sub-clinically affected. Children in As-affected villages may be in special danger.

In 1995, we had found three villages in 2 districts of Bangladesh where groundwater contained  $\geq 50 \mu\text{g l}^{-1}$  As. The present situation is that in 2000 villages in 50 out of total 64 districts of Bangladesh, groundwater contains As above  $50 \mu\text{g l}^{-1}$  and more than 25 million people are drinking water above  $\geq 50 \mu\text{g l}^{-1}$  As. After years of research in WB and Bangladesh, additional affected villages are being identified on virtually every new survey. The present research may still reflect only the tip of iceberg in identifying the extent of As contamination. Although the WB As problem became public almost 20 years ago, there are still few concrete plans, much less achievements, to solve the problem. Villagers are likely in worse condition than 20 years ago. Even now, many who are drinking As-contaminated water are not even aware of that fact and its consequences. Twenty years ago when the WB government was first informed, it was a casual matter, without the realization of the magnitude this problem was to assume. At least up to 1994, one committee after another was formed but no solution was forthcoming. None of the expert reports have suggested solutions that involve awareness campaigns, education of the villagers and participation of the people.

Initially, international aid agencies working in the subcontinent simply did not consider that As could be present in groundwater. Even now, while As in drinking water is being highlighted, there have been almost no studies on how additional As is introduced through the food chain, as large amounts of As are present in the agricultural irrigation water. Past mistakes, notably the ceaseless exploitation of groundwater for irrigation continues unabated today; at this time, more groundwater is being withdrawn than ever before. No efforts have been made to adopt effective watershed management to harness the extensive surface water and rainwater resources of this region. Proper watershed management and participation by villagers are needed for the proper utilization of water resources and to combat the As calamity. As in groundwater may just be nature's initial warning about more dangerous toxins yet to come. What lessons have we really learned?