

Seasonal variability in arsenic concentration in the groundwater of Manipur, North-eastern state of India

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Arsenic contamination in groundwater is posing a severe health threat for a significantly large portion of Indian population. Apart from the state of West Bengal, elevated arsenic concentrations in groundwater are regularly being reported from places in Uttar Pradesh, Jharkhand, Chhattisgarh, Bihar and Assam. It appears that the extent of problem is still not fully known and many areas which are not yet investigated may have arsenic contaminated groundwater. This is especially true in case of North-eastern Indian state of Manipur. A study has thus been conducted to know the extent of arsenic contamination in parts of Manipur and to determine its seasonal variability.

To investigate the extent of arsenic contamination, thirty three groundwater samples have been collected from Imphal, Thoubal and Bishnupur districts of Manipur during pre-monsoon season. These samples were analyzed for major ions, arsenic and iron. In 40% of the collected water samples (i.e. 13 samples) arsenic concentrations well above the WHO prescribed limit ($10\mu\text{g/L}$) were found. Further, the absence of any correlation between arsenic and iron indicates that reduction mechanism may not be responsible for arsenic mobilization in this area.

To determine the seasonal variability in arsenic concentration, 17 sites were re-sampled during post-monsoon season. More than 70% of recollected water samples are showing a general increase in arsenic concentration from pre-monsoon to post-monsoon season. However, the degree of increase in arsenic concentration is not uniform, indicating that the local factors play a predominating role in arsenic mobilization. A detailed study of the entire state is warranted to determine the actual extent of arsenic problem and the resource needed to tackle it.