

## Occurrence of arsenic in soils, groundwater and rice plants in selected districts of Bangladesh

### ABSTRACT

A study was conducted in four districts of Bangladesh, namely Faridpur sadar, Kolaroa (Satkhira), Shibaloya (Manikganj) and Natore sadar to assess arsenic (As) status in groundwater, agricultural soils, rice straw and rice grain. One hundred samples each of soil, irrigation water and plant parts (root, straw, husk and grain) were collected from the four areas for As determination. Results showed that the minimum mean of As in the soils ( $4 \pm 0.17$  ppm) and water ( $2 \pm 1$  ppb) was found in Natore Sadar, while the maximum in the soil ( $35 \pm 16.03$  ppm) and water ( $462 \pm 28$  ppb) was in Kolaroa (Satkhira). Murarikati, Keralkata, Jallabad, Jugikhali and Helatala of Kolaroa showed high As in the soils and groundwater. Similarly, high soil and water As were found in Aliabad, Kajjuri and Majchar (Faridpur) areas. The high As containing areas may be considered as arsenic hot spots. Arsenic content in the deep tube well water was also high in the Kolaroa area. In the hot spot areas, the level of As in rice straw and rice grain was significantly higher than those of the normal soil areas. It implies that increase in the level of soil and water As would result in the increase of As content in rice straw and rice grain. However, As content in the rice grain was below the permissible level for consumption. The accumulation of As followed the order of root > straw > husk > grain.

**Keyword:** Arsenic toxicity; Irrigation water; Drinking water; Hot spot area