

Groundwater and aquifer sand concentrations of arsenic along the Ravi River in Punjab, Pakistan

N. MUSHTAQ^{1*}, A. FAROOQI¹, J.A. KHATTAK¹,
I. HUSSAIN¹, B.J. MAILLOUX², T. ELLIS³, A. VAN GEEN³

¹Department of Environmental Sciences, Quaid-e-Azam University, Islamabad, Pakistan (*correspondence: nisbahmawan@gmail.com)

²Environmental Science Department, Barnard College, New York, NY 10027, USA

³Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964, USA

Testing of 30,000 wells across 400 villages of the Punjab plains of Pakistan and India has shown that the floodplain of the Ravi River is particularly affected by elevated As in well-water [1]. To try to understand the origin of this pattern, a subset of villages with 0-90% of wells containing $>50 \mu\text{g/L}$ As were selected for drilling to 30 m depth. Lithology or the color of sand cuttings, a proxy for the redox state of the aquifer, were not consistently related to the proportion of high As wells. For the 8 sites drilled within the floodplain of the Ravi River, the average concentration of As in sand cuttings measured by X-ray fluorescence broadly increases with the proportion of high As wells. However, the factors that could help predict if wells in a particular village of the Punjab plains are affected by As have yet to be identified.

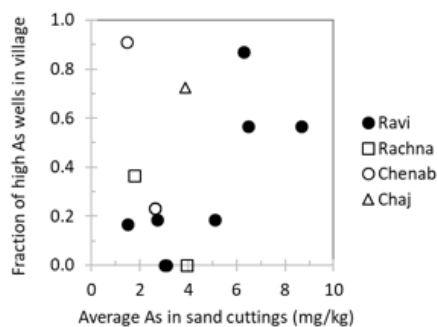


Figure 1. Proportion of high As wells in the village as a function of mean As concentrations in sand at each drill site.

[1] van Geen *et al.* (2019) *Sci Total Environ* **654**, 1358-63.