

## **Citizen science in schools and colleges in Patna, Bihar, India for groundwater contaminant mapping & knowledge transfer**

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We have developed an efficient citizen science based groundwater sampling-analysis scheme focused in Patna (Bihar, India), whilst simultaneously raising awareness of groundwater quality issues amongst target groups.

The citizen science scheme has initially involved five 2 hr visits to schools/colleges in Patna, resulting in the collection of 480 groundwater samples by voluntary citizen scientists, also engaged in knowledge exchange with ourselves.

For sampling involving school pupils it is imperative to have all of age-appropriate aims, safe protocols and cognisance of safe-guarding requirements. To this end activities were designed to reflect age-relevant curriculum objectives, to be coordinated through local school teachers and involved simplified preservation protocols.

Data obtained through this project in the progress of being put into the public domain via the eawag-based Global Arsenic Platform (<https://www.gapmaps.org/>) providing a further educational tool for the student citizen scientists.

With regard to groundwater contaminant mapping and knowledge transfer: notwithstanding simplified preservation protocols (omitting acidification and filtering steps at the point of collection), ICP-MS (As) and IC (F) analyses to date have proved comparable to analogous data previously obtained in the same region [1] – but some challenges remain in authenticating recorded locations in a small percentage of cases; the data obtained have been useful to highlight and explain principles relevant to the chemistry, mathematics and geography curricula and have demonstrably increased local awareness of drinking water As & F related health issues.

**References** [1] Richards et al. (2020), *Int. J. Environ. Res. Public Health*, 17, 2500. **Acknowledgements:** FAR-GANGA (2018-21) (Funded by NE/R003386/1 & DST/TM/INDO-UK/2K17/55(C) & 55(G)); EPSRC IAA Award to UoM (DP)