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## Potential phosphorus and arsenic release in dispersed particulate form from Bangladesh rice fields

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In Bangladesh, rice cultivation covers nearly 75% of the agricultural surface. In the dry season, paddy fields are irrigated with groundwater, often polluted with arsenic (As), phosphorus (P), iron and other elements. The most affected zones belong to the Ganges Floodplain (GF) and Meghna Floodplain (MF) soil series. Irrigation causes a continuative input of As and P in soils, although mineral fertilizers remain the main P source. Soils can lose important amounts of As and P in solution or in particulate form especially during monsoon season. The potential transfer of P from Bangladesh soils to waters has received scant attention and the potential As transfer associated to dispersed particles is generally not considered. In the present work soil samples representative of the GF and MF series were characterized and the potential transfer of P and As with dispersed particles was evaluated using a simple water dispersion test (DESPRAL).

The GF soils are calcareous, with silt-loam to silty clay texture, while MS soils are noncalcareous with mainly silt-loam texture. Nearly 30% of the < 20 µm total granulometric fraction was water-dispersible in the MF soils and 20% in the GF soils. The average total soil P did not differ between the two series, while total As was higher in the GF soils. However, soluble P and dispersible P and As were higher in the MF compared with GF soils, as well as P and As Enrichment Factors (PEF, AsEF) in the < 20 µm dispersible fraction. The PEF and AsEF were respectively 1.5 and 2.6 in the MF soils and 1.2 and 1.8 in the GF soils. These results, considering the important raining events in the monsoon season, suggest particulate dispersion as one of major possible processes for P and As transfer from soil to surface waters, especially in the Meghna Floodplain soils.