

# Distribution of Arsenic in Soil, Water and Rice Plant in a Macro-environment of the Command Area of a Shallow Tube Well

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## INTRODUCTION

Faridpur Sadar Upazila of Bangladesh appears to be a highly arsenic (As) contaminated area based on our preliminary assessment (Panaullah et. al., 2003). This area belongs to the agroecological zone, Low Ganges River Floodplain (AEZ 12). It is located between 23<sup>0</sup>29' and 23<sup>0</sup>44' north latitude; and between 89<sup>0</sup>41' and 89<sup>0</sup>56' longitude. The Upazila occupies an area of 396 km<sup>2</sup> including 16 km<sup>2</sup> of riverine landscape. The arsenic distribution in soil, irrigation water and rice plant system in a Shallow Tube Well (STW) command area was studied.

## METHODS

A 5-acre STW command area in the Kanaipur Union of Faridpur Sadar Upazila was selected for this study. The farmers in this area grow different types of Boro rice using arsenic contaminated irrigation water (0.2 mg As/L). A total of 101 sampling points 20m apart within the command area, geo-referenced by GPS, were marked. Soil and rice plant samples were collected from each point and analyzed for arsenic (by AAS-HG method) and also other parameters (by standard methods). Soils were also collected from different points of the main channel maintaining 20m equal distances from the source before starting irrigation for growing Boro rice and after crop harvest.

## RESULTS AND DISCUSSION

Arsenic concentrations in the soil of main channel decreased with increasing distance from the irrigation source. It was also found that post-harvest drain soil contained higher arsenic as compared to initial drain soil (Fig. 1). It might be due to arsenic added from the

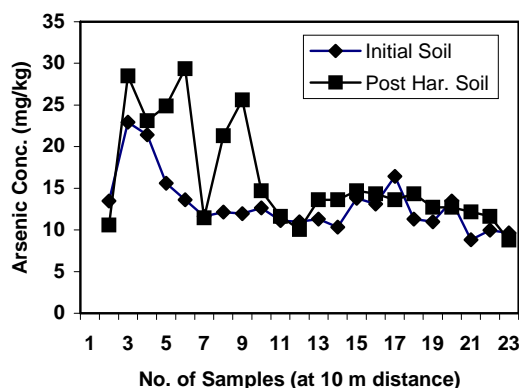
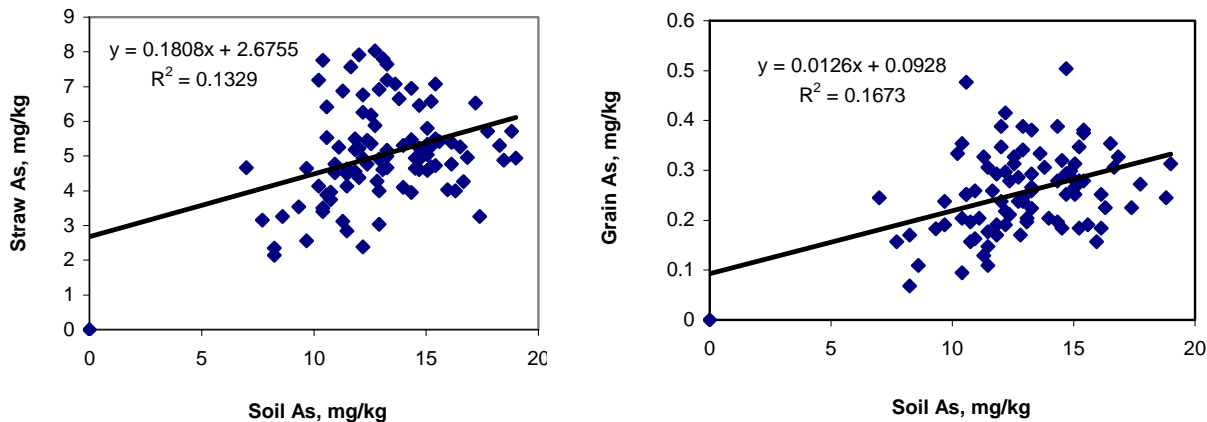


Fig. 1 Distribution of arsenic in the drain soil of the command area



**Fig. 2 Relationship among total soil As, rice straw and rice grain As**

irrigation water within a season. The concentration of arsenic distributed in the soil ranged from 7-19 mg/kg, 0.08-1.00 mg/kg in rice grain and 0.64-10.04 mg/kg in rice straw. A positive but not highly significant relationship was found in arsenic distribution among the soil, rice straw and rice grain (Fig. 2). On the other hand, wide variations of arsenic level in soil and rice plant were observed within the macro-environment of the STW command area.

## CONCLUSION

Further studies are needed to understand the arsenic distribution mechanism (s) in a macro-environment of a STW command area.

## ACKNOWLEDGEMENT

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## REFERENCES

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