

Water quality and Arsenic contamination in the ground waters of the Gangetic Plains in India. A future concern

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The ground and surface water As contamination in the selected stretches of Gangetic plains has been studied. Ground water samples and surface water samples were collected in the flood plain of the river Ganga and associated tributary regions from 2000-2003 .The water samples were collected from shallow <20m and deep aquifers 80-100m. The other parameters like Eh, pH, EC, TDS , HCO₃ were also measured in the field itself. The samples are analyzed for major cations, anions and dissolved heavy metals.

The HCO3 and Cl shows a very little variations in comparison to PO4, SO4 and NO3 in space and time. It indicates that besides natural weathering process anthropogenic process plays a major role in controlling their concentrations. There is strong correlation exits between the water table fluctuation and the Ionic concentrations in most of the study areas. The heavy metal concentration are in very low concentration except Fe and As in selected locations. The As in the surface water ranges from 1.895 12.330 µg l⁻¹ and in the ground water it ranges from 0-80 and 140µg l⁻¹. The concentration of As is very high in the few villages near to the Ganges river basin. The Concentration of As near the near by inland lakes is also very high. The Concentration of As is moderate to low in the interior flood plains. The surface water shows high concentration near the confluence of the tributaries indicating the influence of different litho logical sources over their concentrations.. The Ghagra river seems to contributing more As. The ground water in the shallow and intermediate aquifers has more As compared to deeper aquifers in Ghagra river where as deep aquifer near Ganga river has more As concentration. The correlation between Fe and As is very poor (<0.5). The sulphate concentration in ground water is very less compared to surface waters. This may be due to the river bound suspended sediments get deposited in the regions and undergo reduction in the deep layers, the solid phase capable of removing the As from solution when condition changed from oxidation to reduction, the rate of reaction is generally influenced by microbial processes. The difference in solubility of Fe versus AsS and precipitation of FeS may remove Sulfides from Solution and not As if precipitation rates are fast. The lack of incorporation of As may results in accumulation of dissolved As (III) if adsorption is weak. Few aquifers seems to be particularly in risk state due to the existing geochemical conditions in which oxidized and reduced waters mix, and where the amount of Sulphate available for microbial reduction seem to be limited. This is a preliminary study and the detailed study is under progress to assess exactly the processes controlling concentrations in surface and ground waters.