

## **FLUORIDE CONCENTRATION IN GROUNDWATER - FOCUS ON HARD ROCK AND ALLUVIAL REGIONS OF ORISSA, INDIA**

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### **Abstract**

Chemical analysis of water samples collected from phreatic aquifers and confined/semi-confined aquifers representing the hard rock and alluvial terrains of Orissa reveals high fluoride content in the confined/semi-confined aquifers especially in granite gneisses and granites. The maximum fluoride concentration of 4.1 mg/L was observed at Sarbang of Nuapara district at a depth of 163 m bgl. It is also observed that deeper fractures between 145 to 175 m bgl are vulnerable to high fluoride concentration which may be due to dissolution of Ca/Mg minerals in the granite gneiss/granite formations. In the phreatic aquifers in hard rock and in alluvium, fluoride remains within permissible limit. The maximum value observed was 1.4 mg/L in parts of Kendrapada district at a depth of 3.76 m bgl in alluvial deposits, which may be due to anthropogenic activities. It has also been observed that fluoride concentration is inversely related to dissolved Ca, Mg and is positively correlated with Na. Some case studies of high fluoride areas have been presented.

*Keywords:* Groundwater, Hard rock, Alluvium, Dissolution, Water harvesting.