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DEPARTMENT OF CIVIL ENGINEERING

A Project Report on

"Groundwater Quality: with Focus on Fluoride Concentration in Rural Parts of Bagalkot District, Karnataka and Defluoridation Studies"

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ABSTRACT

Water is an essential natural resource for sustenance of life and environment that we have always thought to be available in abundance and free gift of nature. However chemical composition of surface or subsurface water is one of the prime factors on which the suitability of water for domestic, industrial and agriculture purpose depends. In North Karnataka region especially Bijapur, Bagalkot and Gadag districts are dry and drought prone areas. Dependability of ground water for drinking and irrigation is more. Fluoride is one of the main problems associated with the quality of ground water in the area resulting into dental and skeletal Fluorosis. Generally higher proportions of dissolved constituents are found in ground water than in surface water because of greater interaction of ground water with various materials in geologic strata. Therefore in this study Groundwater quality studies of Bagalkot district with focus on Fluoride is carried out.

Ground water samples from borewells or hand pumps are collected from different Fluoride affected area of Bagalkot district, by visiting each village. In laboratory water quality analysis is performed to determine the amount of Fluoride, Chloride, Total Hardness, Total Dissolved Solids, pH, Nitrate, in ground water as per standard methods. Fluoride concentration in this area varied from 0.4 to 4.1 and other water quality parameters like Chloride, TDS, hardness, pH, nitrate are measured. In the study area it is found that hardness is more and in some area TDS and chloride is also found above the permissible limit. Maps of Fluoride and other mineral area affected villages of each taluk are prepared. So that the area or villages which listed in this study are having high fluoride content and also other chemical parameters found higher than the permissible limits and cannot be used for drinking purpose without any treatment.

Defluoridation by fixed bed adsorption using mixed bed containing zeolite, Alumina and Bone ash in equal proportion in a column is performed. The method is simple and economical and removes 50-60% of Fluoride. Therefore the method can be used where the Fluoride content up to 3-3.5 mg/L.