

## Improvement of Ground Water Quality Index Using Citrus limetta

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**Abstract :** The demand for water is increasing at an alarming rate due to rapid urbanization and increase in population. Due to freshwater scarcity, Groundwater became the necessary source of potable water to major parts of the world. This problem of freshwater scarcity and groundwater dependency is very severe particularly in developing countries and overpopulated regions like India. The present study aimed at evaluating the Ground Water Quality Index (GWQI), which represents overall quality of water at certain location and time based on water quality parameters. To evaluate the GWQI, sixteen water quality parameters have been considered viz. colour, pH, electrical conductivity, total dissolved solids, turbidity, total hardness, alkalinity, calcium, magnesium, sodium, chloride, nitrate, sulphate, iron, manganese and fluorides. The groundwater samples are collected from Kadapa City in Andhra Pradesh, India and subjected to comprehensive physicochemical analysis. The high value of GWQI has been found to be mainly from higher values of total dissolved solids, electrical conductivity, turbidity, alkalinity, hardness, and fluorides. In the present study, citrus limetta (sweet lemon) peel powder has used as a coagulant and GWQI values are recorded in different concentrations to improve GWQI. Sensitivity analysis is also carried out to determine the effect of coagulant dosage, mixing speed and stirring time on GWQI. The research found the maximum percentage improvement in GWQI values are obtained when the coagulant dosage is 100ppm, mixing speed is 100 rpm and stirring time is 10 mins. Alum is also used as a coagulant aid and the optimal ratio of citrus limetta and alum is identified as 3:2 which resulted in best GWQI value. The present study proposes Citrus limetta peel powder as a potential natural coagulant to treat Groundwater and to improve GWQI.

**Keywords :** alum, Citrus limetta, ground water quality index, physicochemical analysis

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