INTRODUCTION:

Rapid increases in population and urbanization causes an increase in the demand for water and this in turn leads to over pumping of ground and surface water. Land use change for urbanization and agricultural activities commonly results in the deterioration of water quality. Consequently, water quality issues like groundwater salinity is a major concern for water resources development projects (irrigation) as well as for human health (drinking water supply). In Bagalkot district major the groundwater is mainly being used for irrigation and drinking. Previous studies indicate that, the Bagalkot Taluk is affected by high hardness and Hunagund Taluk by Fluoride. But detailed water quality study was previously not available for our area, so this area was selected for our project; and 62 samples were analysed which includes 9 surface and 24 ground water samples from Bagalkot taluk and 5 surface and 24 ground water samples from Hungund taluk.

OBJECTIVES:

1. Analyzing the surface and subsurface water samples that are collected and comparing them with WHO and Indian standards for checking their suitability for drinking purpose.
2. Finding the irrigation properties like Residual Sodium Carbonate (RSC), Sodium Absorption Ratio (SAR), Permeability Index (PI), Percent Sodium (%Na) and Magnesium Hazard (MH) and check the water suitability for irrigation usage.
3. Graphical representation of analysed data by Pipers trilinear diagram, Gibbs plot, Wilcox diagram and Permeability plot.

MATERIALS AND METHOD:

Water samples are analysed for the parameters Ca2+, Mg2+, Na+, SO42-, NO3-, HCO3-, F-, Cl-, K+, CO3, EC, TDS, TH and pH for checking suitability for drinking and domestic purposes. Also SAR, RSC, %Na, PI and MH were checked for checking suitability of water samples for irrigation purposes. Graphical representation of data includes Gibbs plot which gives possible source of accumulation of ions into the water, Pipers trilinear diagram showing chemical character of surface and subsurface water and hydrochemical facies, Wilcox diagram for classification of water based on EC and SAR, Doneen diagram is plotted for classification of irrigation water based on permeability index. The ions such as Ca2+, Mg2+, HCO3-, CO3, total hardness are analysed by gravimetric methods. NO3- and SO4 are calculated using Spectrophotometer and Na+, K+ are analysed by Flame photometer. Further
RESULTS AND CONCLUSIONS:

The geochemical study of surface and ground water resources of Hunagund and Bagalkot Taluks shown that mildly acidic to alkaline. Calcium and Magnesium are major cations and anions are contributed by chloride and sulphates. The alkaline earth exceeds alkalies and the strong acids exceed weak acids. The water chemistry is largely controlled by rock weathering. For drinking and domestic purposes almost all water samples satisfy the required conditions hence they can be used for domestic and drinking purposes. The calculated parameters SAR, %Na, RSC and PI shows that water is generally suitable for irrigation use. But magnesium hazard for every sample exceeds the limit except three surface water samples of Sitimani, Rampoor irrigation canal and Nandawadagi surface water. Out of 14 surface water samples collected in both hungund and bagalkot taluk considering all the water quality parameters 9 water samples were potable and 5 water samples were non potable. Among 48 ground water samples only 1 sample was potable that was of Amblikopa, remaining all ground water samples are non potable, this results are given considering all water quality parameters compared with BIS, but on general purpose these water samples can be used as potable water with some treatment. Considering separate water quality parameters 16 Ground water samples and 3 surface water samples are non potable considering Cl–, considering TH only one surface water sample was non potable and 11 ground water samples are non potable. All surface and ground water sample considering the parameters SO4²⁻ and NO3⁻ are potable. Considering TDS only 2 ground water samples are non potable. All surface water samples are potable considering F⁻ content, and 17 ground water samples are non potable comparing areas F⁻ content is more in Hungund taluk compared to Bagalkot taluk. 6 surface and 30 ground water samples is non potable considering Ca²⁺ and Mg²⁺.