Literature Review

In India, there are over 20 million private wells in addition to the government tube wells (CGWB, 2009).

The wells are generally considered as the worst type of ground water sources in the term of physicochemical contamination due to the lack of concrete plinth and surrounding drainage and waste water disposal system. (WHO, 1997).

Over burden of the population pressure, unplanned urbanization, unrestricted exploration and dumping of the polluted water at inappropriate place enhance the infiltration of harmful compounds to the ground water.\(^{16}\)

The hydro geochemical conditions are also responsible for causing significant variations in groundwater quality.\(^{21}\)

Various workers in our country have carried out extensive studies on Water Quality. Abbasi et al. and Jagdap Jyashri et al. have studied water quality.\(^{1}\)

Suitability of groundwater for drinking, irrigation and industrial purposes depends upon its quality. Changes in groundwater quality are due to variation in climatic conditions, residence time of water with aquifer materials and inputs from soil during percolation of water.\(^{8}\)

Chloride content of the water samples was low in rainy season. According to WHO, maximum permissible limit for chloride is 500mg/l. Total dissolved solids (TDS) is a measure of the combined content of all inorganic and organic substances contained in a liquid in molecular, ionized or micro granular suspended form. The permissible limit of TDS of drinking water is 500 mg/l (WHO, 2004). The maximum permissible limit of this parameter for drinking water is 300\(\mu\)mho/cm. However, the average specific conductivity exceeds this limit because of its high values during rainy season. In rainy season due to floods and rains, water level in the well increases, which contains more electrolytes Total alkalinity of water in terms of CaCO3 varied from 270-320mg/l. The values of total alkalinity were comparatively moderate. The water for domestic use having alkalinity less than 100mg/l is safe.\(^{23}\)

Conductivity is the measure of capacity of a substance to conduct the electric current. Most of the salts in water are present in their ionic forms and capable of conducting current and conductivity is a good indicator to assess groundwater quality.\(^{4}\)

Understanding the groundwater quality is important as it is the main factor determining its suitability purposes.\(^{25}\)
The high concentrations of chloride can give a salty taste to drinking water. It can increase the rate of corrosion in water pipes. According to WHO the taste thresholds for chloride are in the range of 200–300 mg/liter. On the average, concentrations in excess of 250 mg/liter can be detected by taste. The chloride concentration greater than 600 mg/liter would markedly impair the portability of water. This value is the maximum permissible concentration for drinking water.

An increase in pH level can liberate P from its binding with ferric complexes, due to the competition between hydroxyl ions and the bound P ions.

Chandel et al (2008) have studied quality of ground water of Jaipur city and its suitability for domestic and irrigation purpose. They reported groundwater quality of Jaipur city experienced degradation due to rapid urbanization and industrialization. Gadhave et al (2008) have studied water quality in industrial area near Shrirampur Maharashtra. They reported that the natural quality of ground water tends to be degraded by human activities.

Ilangeswaran et al (2009) studied assessment of Quality of Groundwater in Kandarvakottai and Karambakudi Areas of Pudukkottai District, Tamilnadu. They found that almost all the parameters for most of the samples in permissible limits.

Mukherjee et al (2005) studied assessment of groundwater quality in the south parganas (province), west Bengal coast. They reported that the concentrations of various ions are above the permissible limits for drinking and irrigation purposes.

Mohan et al (1988) studied Fluoride Concentration in Ground Water of Prakasham District in India and they reported, groundwater samples contained high concentrations of fluorides compared to open well and pond water samples.

Shyamala et al (2008) studied Physicochemical analysis of bore-well water samples of Telungupalayam area in Coimbatore (Shyamala, 2008), they reported the ground water is fit for domestic and drinking purpose and need treatments to minimize the contamination especially the alkalinity.
Total dissolved solids (TDS) is a measure of the combined content of all inorganic and organic substances contained in a liquid in molecular, ionized or micro granular suspended form. The permissible limit of TDS of drinking water is 500 mg/l.\textsuperscript{26}

The investigation in ground water resources in any region is primarily concerned with its utility for irrigation. Another interesting purpose of studying ground water would be to consider the distribution of various salts from geochemical view point. In majority of the arid and semi-arid regions, farmers depend on underground saline waters for crop production because no other source of water exists. The quality of groundwater is influenced by the nature of rock minerals through which it passes; it may undergo changes due to ion-exchange, dissolution of salts and hydrolysis of the material of the rocks as well as the surface soils. The ground water resources are generally classified on the basis of total dissolved salts as measured by electrical conductivity (EC) as well as the ratio of sodium to total cations, ratio of chloride to bicarbonate and the excess of bicarbonate over calcium plus magnesium. Salinity of the ground water, depth of the water table and quantities of waters available are some of the considerations for their efficient use.

Various investigators have suggested the criteria of classification of irrigation waters on the basis of analysis made (Richards, 1954; Paliwal and Yadav, 1976; Ayers and Westcot, 1976).\textsuperscript{22, 15, 3} some important and widely acceptable ratings are given below. These should be taken as a general guideline and necessary correction may be made depending upon the soil crop situation.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Permissible/ safe</th>
<th>Moderate safe</th>
<th>Moderate unsafe</th>
<th>Unsafe</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSC (me L\textsuperscript{-1})</td>
<td>&lt; 1.25</td>
<td>-</td>
<td>1.25 to 2.50</td>
<td>&gt; 2.50</td>
</tr>
<tr>
<td>SAR</td>
<td>&lt; 10.0</td>
<td>10 to 18</td>
<td>18.0 to 26.0</td>
<td>&gt; 26.0</td>
</tr>
<tr>
<td>Boron mg/L</td>
<td>&lt; 20.0</td>
<td>2.0 to 2.5</td>
<td>2.5 to 3.0</td>
<td>&gt; 3.0</td>
</tr>
<tr>
<td>Chloride mg/L</td>
<td>&lt; 140</td>
<td>140.00 to 350.00</td>
<td>-</td>
<td>&gt; 350</td>
</tr>
</tbody>
</table>

\textit{(Soil plant water analysis)}