International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 04 Issue: 02 | Feb -2017 www.irjet.net p-ISSN: 2395-0072

ASSESSMENT OF SALT WATER INTRUSION INTO THE COASTAL AQUIFERS OF KERALA

Midhun Thomas[1], Shabeera Hafsath[2], Mohamed Suhail T[3]

[1] B. Tech student, Civil Engineering Department, M.E.S. College of Engineering, Kuttippuram, Kerala, India
[2] B. Tech student, Civil Engineering Department, M.E.S. College of Engineering, Kuttippuram, Kerala, India
[3]Assistant Professor, Civil Engineering Department, M.E.S. College of Engineering, Kuttippuram, Kerala, India

---

Abstract - *As the world's population continues to grow at an alarming rate, fresh water supplies are constantly being depleted, bringing with it issues such as saltwater intrusion and increasing the importance of groundwater monitoring, management, and conservation. The migration of salt water into freshwater aquifers under the influence of groundwater development is known as salt water intrusion. Salt water intrusion is typically detrimental to an environment. Salt water can also contaminate drinking water in coastal communities. A case study was conducted at Kadappuram panchayat in Chavakkad municipality. The raw or treated water can be checked and analysed for creating a correlation between selected parameters and plotting a salt water intrusion profile.*

Key Words: aquifer, saltwater intrusion, correlation, saltwater intrusion profile.

1. INTRODUCTION

Ground water is the largest source of fresh water on the planet. It has been utilized to a great extent to meet the needs of agricultural, industrial and municipal water supply schemes. It may get contaminated due to the presence of salinity. Saltwater intrusion is the migration of saltwater into fresh water aquifers under the influence of ground water development. Saltwater encroachment is the major hazard to the public in all coastal zones. The coastal aquifers of Kerala experience severe degradation of water quality due to various anthropogenic activities. Kerala, the southernmost state of India has unique hydro geological characteristics with wide variation in the rainfall pattern. Both qualitatively and quantitatively, the coastal zones of Kerala in recent years witnessed serious ground water problems. Owing to the high demand of ground water to cater a large population in the coastal zones of Kerala, mitigation of the deterioration in the quality of ground water in shallow coastal aquifers was initiated through ground water recharge. The $Cl/(CO_3+HCO_3)$ ratio is one of the important criterions to evaluate saltwater intrusion.

The Objectives of the present study was, to plot the salt water intrusion profile for the analysed data of water samples collected from the coastal plain of Kadappuram panchayat and to study the correlation coefficient of analysed parameters using SPSS Software.

2. STUDY AREA

The selected area for investigation of saltwater intrusion into coastal aquifers was Kadappuram panchayat in Thrissur district, in the state of Kerala, India. It is located geographically 10°32′30″in north latitude and 76°1′37″ in east longitude. It covers an area of 9.63km^2.It is situated to the west of canola canal. Kadappuram panchayat can be called a half island since three sides of this panchayat is covered by water.

3. MATERIALS AND METHODS

Ground Water collected from selected area is achieved through eleven wells covering an area of two and half kilometers in the coastal plain. Samples were collected in plastic bottles of 1 Littre capacity during post and pre monsoon seasons. Water quality parameters like pH, alkalinity and chloride were analyzed in the laboratory, following standard analytical procedures (APHA 1995).

To delineate the seawater intrusion in the study area, $Cl/(CO_3 +HCO_3)$, ratio were used. Normally this ratio is less than 0.05 for fresh groundwater, 0.05 - 1.30 for slightly contaminated groundwater, 1.30 - 2.80 for moderately contaminated ground water, and greater than 2.8 for injuriously contaminated groundwater.

Measured data were statistically analysed by using SPSS software, to find out most significant parameters among