CHAPTER II
Significant geological studies of the basin have been carried out by Murthy et al (1978). Ramanaiah (1993) has given the various geological formations of Sagileru basin in Kadapa district of Andhra Pradesh. Drainage network patterns have been studied by Thornbury (1986). Similar studies were also carried out by Kale and Gupta (2001). The details of morphometric analyses are given by Clarke (1967). An exhaustive study of the development and geometry of streams has been made by Horton (1945). Later, Strahler (1964), Leopold and Maddock (1953) made the best inference of the hydraulic nature of streams from quantitative studies of length and slope of streams. Miller (1953) studied the geomorphic characteristics of drainage basins in mountainous areas. The hydraulic character of streams in relation to the drainage pattern has been studied by Leopold and Miller (1956).

Dhruvanarayana et.al (1973) have estimated the recession constant for the research farm of the Central Soil Salinity Research Institute at Karnal, India. From the recession constant they have estimated the recession coefficient of the aquifer. Jaganadha Sharma and Subba Rao (1973) have investigated the water table fluctuations with rainfall and evaluated the recharge rate, recession rate and porosity of the Chandra Palem basin in Visakhapatnam district of Andhra Pradesh, India. Karanth (1978) has studied
the watertable fluctuations with rainfall for various basins of Andhra Pradesh in India. In his study Karanth has estimated threshold rainfall, recession constant and rainfall infiltration factor for various geological formations in India. Baig (1981) has studied the watertable fluctuations in Sriharikota Island in Nellore district of Andhra Pradesh. Janardhan Reddy (1993) has studied the watertable fluctuations of the West Godavari district of Andhra Pradesh, India. Srinivasa Goud, et.al., (2000) have studied the groundwater balance for Peddavanka watershed in Anantapur district of Andhra Pradesh. They have estimated the recharge of the basin as per the guidelines issued by the Groundwater Estimate Committee (GEC) of Central Groundwater Board, India. Mondal et.al, (2002) have studied the recharge and response of Kodaganar river basin due to rainfall, through cross correlation technique. Kumar and Elango (2002) have studied the relation between rainfall and groundwater level for the lower Palar river basin and estimated the rainfall range for the aquifer recharge. In the present case an attempt is made (Reddy, 2002) to quantify the threshold rainfall for the Sagileru basin apart from finding out the porosity of the formation.

Pixie and Dennis (1995) in their work on effect of agricultural activities on nitrate and other organic constituents in the surficial aquifers, concentrations of nitrate in groundwater samples have been plotted as box plots on semi log paper. Sikdar and Battacharya (1999) have given average chemical quality of some selected parameters for drinking water and irrigation water for the Jhalda-II block, India and have also given the distribution of
hydrochemical facies of groundwater as Piper diagram. Shadab, et.al, (2002) have given Piper's trilinear diagram showing chemical character of groundwater of Yamuna - Karwan sub-basin in Aligarh - Mathura districts, India. They have concluded that the groundwater in study area was alkaline. Ahammed, et.al, (2002) have carried out geostatistical analyses of hydrochemical parameters in Maheswaram Watershed, Andhra Pradesh and studied spatial variability of various chemical parameters and estimated correlation among various chemical constituents. In their study, Satyanarayana and Periakali (2002) have analyzed hydrochemical facies of groundwater from summer to winter seasons with the help of Piper plots. Chidambaram et al (2002) have detailed the variation of hydrochemical facies in shallow, intermediate and deep groundwaters by Piper diagram. Chourasia (2002) has used Scholler diagram to compare the chemical constituents in groundwaters.

Various investigators have carried out studies on the quality of groundwater and proposed the suitability of groundwater for various purposes. Janardhan Reddy (1993) has classified the suitability of groundwater for irrigation in West Godavari district of Andhra Pradesh, India. He has also proposed the suitability of groundwater for domestic purposes based on the presence of various chemical constituents. In the similar fashion Lokesh and Narayana Shenoy (1996) have studied the suitability of groundwater for irrigation in Pangala river basin, Karnataka, India. They have suggested that the groundwater in the study area is suitable for irrigation
purpose and is also suitable for domestic purpose with a few exceptions. Elampooranam (1996) has studied the irrigational suitability of groundwater of Kumbakonam and Thiruvidaimarudur taluk of Tanjavur district, South India. It is recommended that the groundwaters in the study area could be used for all types of crops on soils of medium to high permeability.

Jain, et.al., (1999) have studied the groundwater quality of Doon Valley, Deharadun and carried out statistical analysis of the data to yield correlation matrix and multiple linear regression equations. Shadab, et.al, (2002) have studied the chemical quality of water based on Physico-chemical parameters. Major ions have been investigated to ascertain its suitability for drinking and irrigation purposes in parts of Yamuna - Karwan sub-basin of Aligarh - Mathura districts of Uttar Pradesh, India. In their study Omkar Singh et.al, (2002) have assessed the suitability of groundwater for irrigation in the districts of Jammu and Kathua of Jammu and Kashmir in India. They have concluded that in the study area the salinity of groundwater had become an “increasing problem” at majority of the sites. Santhanam et al (2002) have assessed the environmental degradation due to tannery industrial pollution in upper Palar basin in Tamil Nadu, India, using remote sensing and GIS techniques.

Selve Kumar and Manoharan (2002) have studied the suitability of groundwater for drinking purpose in Dindigul Taluk of Tamil Nadu, India. They have studied the quality of groundwater for drinking purpose as per the guidelines of Central Public Health Organization (CPHO) India - 1993.
Pandian, et al. (2002) has carried out detailed geological, geomorphological, hydrogeological, geochemical and land use studies in Kodain river basin in Kanyakumari of Tamil Nadu in India. Rao, et al. (2002) have used remote sensing and GIS techniques in the preparation of integrated groundwater resources map indicating groundwater prospects, quality and depth to water level for Mewat area of Haryana State, in India.

Umar & Umar (2002) have characterized the groundwater in parts of Etah district central Ganga Alluvial Plain, Uttar Pradesh, India. In their study they have considered SAR, major cations and anions to characterize the groundwater. They have also suggested the suitability of groundwater for both domestic and irrigation uses. Chidambram et al. (2002) have studied the groundwater quality for sustainable use in Erode district of Tamil Nadu, India. They have characterized the groundwater of the study area based on electric conductivity and total dissolved solids for general purpose, and also they have considered fluoride ion concentration in the study area to suggest the suitability of groundwater for drinking purpose. In his study Chourasia (2002) found the groundwater to be suitable for domestic as well as irrigation purposes in the catchment area of Rajghat dam project, India. Jain and Sharma (2003) have studied the fluoride contamination in Jodhpur district of Rajasthan in India. In their study they observed a positive correlation of fluoride with alkalinity and pH. It was also concluded that the higher alkalinity of the groundwater promotes the leaching of fluoride and thus affects the concentration of fluoride in groundwaters.