1 INTRODUCTION:
The term "Environment " is the most vital for man kind. It is the natural world, which is affected by human activities, as whole or in a particular area geographically. It consists of parameters such as water, soil and air. One Oxygen and two hydrogen atoms combined by covalent bond in each molecule of water. Water is the transparent and no colour material which is main constituent in Earth's surface. Water is one of the essential components for living organisms to live on Earth. Water covers 71% of Earth's surface. Out of which 96.5% of water is saline, only 1.7% of water is groundwater and 1.7% of water is in the form of ice and glaciers.0.001% of water is in the form of vapour and in air. So very less percentage of water is in pure form. It is needed to safeguard the water from pollution for next generations. The combination of presence of organic matter, minerals, gases, liquids, and organisms which support life on Earth is termed as Soil. The main functionalities of soil on Earth are plant growth, water storage, supply and purification. Finally another parameter left out in this study is air. It is the combination of many gases and dust particles on Earth's atmosphere. It is the mixture about 78% of nitrogen, 21% of oxygen, 0.9% of argon, 0.04% of carbon-di-oxide and rest of other gases.

As a part of civilization, humans have created a lot of pollution to parameters of environment such as water, soil and air. In revolution of pollution, vijayawada - the study area is also one of the places on globe effected due to pollution. In this study each environmental parameter like water, soil and air samples were collected randomly in the study area, vijayawada. These samples were tested experimentally for different parameters of water, soil and air in the laboratory. Thus, with one of the methods recommended by researchers, calculation of the quality index for water, soil and air for study area, vijayawada was done. With
the help of quality index said by the researchers the quality is estimated and reported in that particular period and an Environmental Information system is developed with the help of SQL SERVER (Structure query language) and ASP (Active server pages) over internet. And this website is used to identify the places of pollution using latitude and longitude points of study area, vijayawada. This website is utilised as a Decision Support System (DSS).

2. Description of study area

Vijayawada is in capital region of Andhra Pradesh which has great historical importance. This is the place where Arjuna, From Epic Mahabharatha of India, was blessed with "Pasupathastra", the weapon, from Lord Shiva. This city is originated in 1855AD on the bank of river Krishna. This area mostly filled with black cotton soil in and around which is vital role in agricultre. So this is one of the important places in INDIA since this country is agricultural based country. There are three irrigation canals are there in vijayawada. Asia's second largest railway station is there in Vijayawada as well as biggest bus station. It is situated in cardinal points as 16° 31’ North latitude and 80° 37’ East longitude, around 70 km away from the coast. Water from ground can be obtained at 3-5 m from the surface. This place has high temperatures and mostly six months summer and moderate winter. In the year 1888 with an administrative area of around 30 sq km Vijayawada municipality was formed. The Municipality was upgraded to a selection grade in 1960s and further to a Corporation status in the year 1981. The Vijayawada Municipal
Corporation was spread out over an area of 29.4 sq km.

3. Objectives of study
• To develop spatial digital maps database like base map, boundary map etc.,
• To establish attribute digital database consisting selected water, air and soil quality parameters.
• To integrate both spatial and attribute data and develop spatial distribution maps.
• To study the environmental impacts on study area changes over water and soil quality index and to design an expert environmental information system.

4. Research approach

• To develop spatial database consisting of base map, boundary map using survey of India toposheets along with ground data and collateral data with the help of arc/Info GIS.
• To develop attribute digital database consisting of selected water, soil and air quality parameters derived from the analysis of water, soil and air samples collected from pre determined locations from study area.
• To compute water quality index, soil quality index and air quality index for the parameters of water, soil and air collected from the pre determined locations of the study area and to develop spatial distribution maps showing variations in water quality index, soil quality index and air quality index on Arc info GIS platform.
• Develop spatial distribution maps showing variations in various parameters of water, soil and air by integrating the spatial digital data and attribute data on Arc info GIS platform using spline with barriers tool or function.
• Develop a decision support system using Html( Hyper text markup language ) or ASP (Active Server Pages) and SQL server (Structured query language server).
5. Organization of thesis

- **Chapter 1 (Introduction)**
  This chapter details environment, environmental parameters and importance of environment, description of study area, objectives of study.

- **Chapter 2 (Literature Review)**
  In this chapter environmental parameters and their quality indexes of similar projects are reviewed and which are based on remote sensing and GIS methodologies. Few project reviews are detailed in this chapter.

- **Chapter 3 (Methodology)**
  This chapter deals primarily with the work flow chart of fundamental concepts of quality indexes of environmental parameters, Remote sensing and GIS tools. Step by step procedure of methodology adopted for this thesis is discussed. Various steps involved in creation of spatial data, attribute data and spatial distribution maps are detailed in this chapter.

- **Chapter 4 (Creation of spatial database)**
  In this chapter methodology adopted for generation of thematic information/spatial data of entire study area using application of remote sensing, GIS and ground truth studies are discussed. Thematic layers like base map, Land use map have been generated by remotely sensed satellite data. Base map is prepared with the help of SOI (Survey of India) toposheets and updated with satellite data.

- **Chapter 5 (Creation of Attribute database)**
  In this chapter detailed analysis of environmental quality with respective water, soil and air are discussed in this chapter. Water quality that is ground water, in terms of physio-chemical characteristics were analyzed and water
quality index of these samples using weighted arithmetic index method were estimated. Various physio - chemical parameters viz., $p^H$, total alkalinity, total hardness, Chlorides etc., were used to calculate water quality index. Soil analysis of study area was conducted for pre determined soil samples. Soil quality index prepared based on output. Soil quality index calculated from an empirical formula. Air quality index of study area was calculated basing on IND-AQI method.

- Chapter 6 (Integrated study)
  This chapter describes the integration of attribute database and spatial information for the assessment of study area. After identification and analyzing the key environmental issues that is ground water quality, Soil quality and Air quality the assessment and quantification of environmental impacts takes place in this chapter. Spatial distribution maps related with water, soil and air quality indexes were generated.

- Chapter 7 (Design of Decision support system)
  This chapter discusses about development of DSS (Decision support System) using HTML (Hyper Text Markup Language)or ASP (Active Server Pages) and SQL Server (Structured query language server). In this chapter pictorial representation of website is provided.

- Chapter 8 (Results and Discussions)
  In this chapter summary of the entire work carried out by the author in his Ph.D Thesis is given along with the conclusions. Also some of the areas where further studies are to be carried out are also mentioned.