PREFACE

Water is one of the widely distributed natural resource over the surface of earth occurring in the form of oceans, rivers, lakes, springs and streams. In addition there is groundwater too, which occurs under the surface of earth. Groundwater act as reservoir by virtue of large pore space in earth material, as a conduct, can transport water over long distance. While moving, it dissolve number of salts and mineral of host rock through it moves and become tasty as well as potable. However, in many parts of our country as well as in the state, the available groundwater is not suitable for drinking and other purpose only because of biological and chemical contamination due to human activities along with industrialization in urban as well as rural parts of state. The agrobase industrial progress of the state can be traced back to the last quarter of 19th century. In the beginning, Bombay continued to be an industrial center for the growth of textile industry. This growth has played very important role in speeding an industrial culture in the hinterland of the state. This has further laid to an emergence of many agro base industries like Sugarcane, Distilleries, Paper and Pulp, Dairies etc. in the rural area of state. These industries, especially in Maharashtra hold key position in governing the economy, education and politics of the state. Maharashtra is one of leading state having 183 sugar factories owned by private and cooperative sectors. In spite of the fact that, the agrobase industries are backbone of rural economy of Maharashtra, subsequently a need has arise to review and take cognizance of the other associated problems of environment like soil, air and water pollution etc. Recently, identified severe stress on natural water in rural
areas is the agro base (especially, Sugarcane, Distilleries, Paper and Pulp etc.) industrial development. The disposal of wastewater emerging from these industries with or without proper treatment has been cause of deterioration of groundwater quality, adversely affecting water supply for agricultural use and even soil quality. The comprehensive account of chemistry of surface as well as on groundwater and soil have been carried out by number of workers during last few decades in the rural part of our country as well as in the state of Maharashtra. However, limited data are available regarding the effect of agrobase industrial effluent on the groundwater quality and hence soil chemistry. Taking into account, several factors, affecting the water and soil quality in rural areas, the present investigation was undertaken to assess the impact of agrobase industries on the basic quality of groundwater and soil from the Sonai area, in the Ahmednagar district of Maharashtra state. The work includes the hydro geological investigation, sampling and collection of ground water, soil and effluent, physicochemical characteristics, spatial variation, hydrochemical facies, quality of water for different use and water properties in relation with soil.

In hydro geological investigation a short account of geology and hydrology of area under study is given. Similarly, well inventory of the dug wells has been conducted during study period from the area to know the diameter, depth of water table, depth of well and number of lined and unlined wells which was essential for understanding the groundwater movement in the area under study.

The planning of sampling was done by knowing the topography, agricultural practice (pattern), environmental behavioral pattern of area and operational period of Mula sugar factory. In all 25 sampling stations
(dug well/bore wells) were selected and samples were collected monthly during the year 2003-2004 for analysis. However, soil sample were collected only once during the off period of Mula sugar factories from 9 stations in May 2004. The effluent sample from flowing stream was collected twice during the operational period of factory.

All samples were subjected to physicochemical analysis by adopting appropriate and standard methods to determine pH, Electrical Conductivity, Color, Total Dissolved Solids, Hardness, Alkalinity, Acidity, Dissolved Oxygen, Biological Oxygen Demand, Chemical Oxygen Demand, Chlorides, Sulphate and Nitrates. Results obtained after analysis were correlated with each other to find out spatial and temporal variations of chemical constituents in the terms of hydro chemical facies. The results (Values) of chemical parameters was used to assess the quality of water for different purpose by correlating with standards and adapting index like Sodium Absorption Ratio, Residual Sodium Carbonate, Kelly’s Index, Soluble Sodium Percentage, Scholler index and salinity hazard diagram. Correlation matrix of soil and ground water (water used to irrigate same soil) is done and impact of water on soil was assessed. Similarly, attempt has been made to categorize soil in different types on the basis of Exchangeable Sodium Percentage with spatial variations.

The work on different aspects has been presented in the form of thesis, which includes preface, introduction, material and methods, results and discussion with reference to quality of water and soil properties in relation with water and references.

With the hope that the finding arrived in this work will be valuable to others who may be subsequently investigating different areas.
elsewhere in more details form different angles. Similarly findings may have some practical importance in planning and management of water and soil for various purposes, particularly in the agrobase industrial areas of the Maharashtra state.