



A Study of Ground Water Resources in Jalna District

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Introduction:

Groundwater constitutes 30 per cent of the world's available freshwater. A further 69 per cent is locked up in polar icecaps, while rivers and lakes only represent one per cent. Groundwater is often hidden deep in aquifers, permeable rocks and sediments and is extracted using pumping wells. Often, aquifers can be renewable water resources, slowly replenished by rainfall infiltration over hundreds up to many thousands of years.

A growing global population, coupled with more intensive agriculture and increasing industrial use, have led to an ever-rising demand for groundwater. Water managers in many regions have had to deal with an over-exploitation of accessible aquifers and are often forced to rely on deep ancient groundwater sources for reliable freshwater supplies. Added to this are threats emanating from the spill of contaminants and toxins into the groundwater, for instance from agriculture, industry or urban activities. Dealing with pollution in groundwater is more complex as aquifer contamination is extremely difficult to remediate. Stable and radioisotope tracers (nitrogen-15, carbon-13 and tritium) are used to help fingerprint the sources of contaminants and to quantify the transformations and biodegradation of pollutants in aquifer systems.

Study Region:

The region is socio-economically developing in which agriculture is the backbone of the economy. The district is located in the central part of Maharashtra State in Marathwada region. It is located between 19° 15' to 20° 32' North latitude and 75° 36' to 76° 45' East longitude. The north-south extension of Jalna district is 150 Kilometers and east-west stretch of the district is 110 Kilometers. Jalna district has a significant location on Deccan plateau. Except



Ajanta and Satamala ranges and river basins, major part of the district comes under plateau region. The region has major portion under flat topography, hence it supports high concentration of population. Jalna district comprises eight tahsils, four sub-divisions, and eight panchayat samities.

The geographical area of Jalna district is 7727 Sq. Km. According to Census- 2011; there are 4 cities, 970 villages and 781 grampanchayat's in Jalna district. According to 2011 census, total population of Jalna district was 19,59,046. Out of this total population, the male population were 10,11,473 whereas female population were 9,47,573. Sex ratio of the district is 937. The population density of the district was 254 per sq. km. As per 2011 census, district ranks 23rd and 5th in the state and Marathwada respectively in terms of area; similarly the district ranks 26th in the State in terms of population. Literacy percentage of Jalna district is 71.52%.

Groundwater Status in Jalna District:

Major parts of the district are showing falling ground water level trends in northern, southern and eastern parts comprising almost entire Bhokardhan, Jafrabad, Ambad, and Partur talukas and major parts of Jalna taluka in central part of the district. Thus, the future water conservation and artificial recharge structures needs to be prioritised in these areas. on these areas. Ground water quality is adversely affected at many places due to high concentration of some parameters specially nitrate. Adequate sanitary protection to the wells may be provided to control the nitrate contamination.

Groundwater occurrence and movement in the area is influenced by its rock formations. Groundwater potentially depends upon porosity and permeability (both primary and secondary) of rock formations. Jalna district is underlain by basaltic lava flows and alluvium only.



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