

Socio-economic effect on socially-deprived communities of developing drinking water quality problems in arid and semi-arid area of central Rajasthan

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Abstract Rajasthan is well known for its Great Thar desert. Central Rajasthan has an arid to semi-arid environment. The area faces either scarcity of water or poor quality of drinking water. In some areas water is transported 2 km or more, which uses time, energy and money. Rich people have their own sources, which is restricted for use by others. Such conditions are affecting socially-deprived communities, both socially and economically. Groundwater is a major source of drinking water due to the unavailability of surface water. There is a lack of groundwater quality knowledge in the community and the data available is hard to understand by consumers. The CCME Water Quality Index is a tool to simplify the water quality report by rating the water on quality standards. It provides meaningful summaries of overall water quality and trends, which is accessible to non-technical lay people. In the present study the objective is to examine the groundwater quality of six districts (Ajmer, Bhilwara, Pali, Rajasamand, Nagaur and Jodhpur), centrally located in Rajasthan, with arid and semi-arid conditions. CCME WQI is also evaluated to produce quality data in a form to be understood by the community. A total of 4369 groundwater sources in 1680 villages from six districts (76 546 km²) were collected and examined. Results are outlined in the Bureau of Indian Standards (BIS: 10500, 2012) and 2952 sources are unsafe for drinking. According to CCME WQI groundwater of 93 villages is poor, 343 villages are marginal, and 369 villages are fair in quality. Toxicological studies of unsafe drinking water and their remedial measures are also discussed. A tentative correlation between prevailing water-borne diseases and quality parameter has also been shown.

Key words groundwater; water quality index; fluoride; nitrate; central Rajasthan, India