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Collateral Impact of Water Resources Development in an Arsenic Affected Village of Patna District

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Abstract : Arsenic contamination of groundwater and its' health implications in lower Gangetic plain of Indian states started reporting in the 1980s. The same period was declared as the first water decade (1981-1990) to achieve 'water for all.' To fulfill the aim, the Indian government, with the support of international agencies installed millions of hand-pumps through water resources development programs. The hand-pumps improve the accessibility if the groundwater, but over-extraction of it increases the chances of mixing of trivalent arsenic which is more toxic than pentavalent arsenic of dug well water in Gangetic plain and has different physical manifestations. Now after three decades, Bihar (middle Gangetic plain) is also facing arsenic contamination of groundwater and its' health implications. Objective: This interdisciplinary research attempts to understand the health and social implications of arsenicosis among different castes in Haldi Chhapra village and to find the association of ramifications with water resources development. Methodology: The Study used concurrent quantitative dominant mix method (QUAN+qual). The researcher had employed household survey, social mapping, interviews, and participatory interactions. However, the researcher used secondary data for retrospective analysis of hand-pumps and implications of arsenicosis. Findings: The study found 88.5% (115) household have hand-pumps as a source of water however 13.8% uses purified supplied water bottle and 3.6% uses combinations of hand-pump, bottled water and dug well water for drinking purposes. Among the population, 3.65% of individuals have arsenicosis, and 2.72% of children between the age group of 5 to 15 years are affected. The caste variable has also emerged through quantitative as well as geophysical locations analysis as 5.44% of arsenicosis manifested individual belong to scheduled caste (SC), 3.89% to extremely backward caste (EBC), 2.57% to backward caste (BC) and 3% to other. Among three clusters of arsenic poisoned locations, two belong to SC and EBC. The village as arsenic affected is being discriminated, whereas the affected individual is also facing discrimination, isolation, stigma, and problem in getting married. The forceful intervention to install hand-pumps in the first water decades and later restructuring of the dug well destroyed a conventional method of dug well cleaning. Conclusion: The common manifestation of arsenicosis has increased by 1.3% within six years of span in the village. This raised the need for setting up a proper surveillance system in the village. It is imperative to consider the social structure for arsenic mitigation program as this research reveals caste as a significant factor. The health and social implications found in the study; retrospectively analyzed as the collateral impact of water resource development programs in the village.

Keywords : arsenicosis, caste, collateral impact, water resources
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