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# Assessing Socio-economic Impacts of Arsenic and Iron Contamination in Groundwater: Feasibility of Rainwater Harvesting in Amdanga Block, North 24 Parganas, West Bengal, India

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**Abstract :** The present study focuses on conducting a socio-economic assessment of groundwater contamination by arsenic and iron and explores the feasibility of rainwater harvesting (RWH) as an alternative water source in the Amdanga Block of North 24 Parganas, West Bengal, India. The region is plagued by severe groundwater contamination, primarily due to excessive concentrations of arsenic and iron, which pose significant health risks to the local population. The study utilizes a mixed-methods approach, combining quantitative analysis of water samples collected from different locations within the Amdanga Block and socio-economic surveys conducted among the affected communities. The results reveal alarmingly high levels of arsenic and iron contamination in the groundwater, surpassing the World Health Organization (WHO) and Indian government's permissible limits. This contamination significantly impacts the health and well-being of the local population, leading to a range of health issues such as skin The water samples are analyzed for arsenic and iron levels, while the surveys gather data on water usage patterns, health conditions, and socio-economic factors. lesions, respiratory disorders, and gastrointestinal problems. Furthermore, the socio-economic assessment highlights the vulnerability of the affected communities due to limited access to safe drinking water. The findings reveal the adverse socio-economic implications, including increased medical expenditures, reduced productivity, and compromised educational opportunities. To address these challenges, the study explores the feasibility of rainwater harvesting as an alternative source of clean water. RWH systems have the potential to mitigate groundwater contamination by providing a sustainable and independent water supply. The assessment includes evaluating the rainwater availability, analyzing the infrastructure requirements, and estimating the potential benefits and challenges associated with RWH implementation in the study area. The findings of this study contribute to a comprehensive understanding of the socio-economic impact of groundwater contamination by arsenic and iron, emphasizing the urgency to address this critical issue in the Amdanga Block. The feasibility assessment of rainwater harvesting serves as a practical solution to ensure a safe and sustainable water supply, reducing the dependency on contaminated groundwater sources. The study's results can inform policymakers, researchers, and local stakeholders in implementing effective mitigation measures and promoting the adoption of rainwater harvesting as a viable alternative in similar arsenic and iron-contaminated regions.

**Keywords :** contamination, rainwater harvesting, groundwater, sustainable water supply
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