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# Assessment of Groundwater Quality-Related Damage Costs: A Study in Jaffna District

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## Abstract

Groundwater found in the Karstic aquifers are the most crucial and only reliable source of freshwater for Jaffna Peninsula. Anthropogenic activities including overextraction, closely built toilet pits, and excessive use of fertilizers have led to groundwater degradation in the peninsula, both in terms of quality and quantity. Hence, a significant economic burden is exerted on the community due to agrochemical and microbial contamination. Though the existing literature highlights the presence of groundwater degradation and its impacts, few studies have addressed the cost incurred by the society due to this issue. Hence, this study mainly focuses on assessing the damage costs associated with degrading groundwater quality in Jaffna, which is achieved through two specific objectives namely, estimating the damage costs associated with health issues caused by groundwater contamination in Jaffna peninsula and identifying the preventive measures and estimate the associated costs in households. Cost of Illness (COI) approach was used to estimate health damages and cost of preventive measures was estimated using Averting Behaviour Approach. A questionnaire survey was conducted in 80 households from Nallur District Secretariat Division. Information on demographics, health issues associated with poor drinking water quality, and mitigation measures to avoid polluted water consumption were gathered from the sampled households. The annual total estimated damage cost incurred due to health issues and preventive measures was approximately USD 11 million for the entire peninsula. Only 30% of the sampled households had experienced Diarrhoea. The total annual COI extrapolated to the population of the peninsula was USD 2.4 million. Boiling water and purchasing filtered water bottles were the two prominent preventive measures. Out of the sampled households, 87.5% have responded that they practice one of the preventive measures to avoid consuming polluted water. The annual total cost of preventive measures was USD 8.8 million. This study highlights the social cost incurred due to poor groundwater quality and emphasizes the importance of estimated values in justifying the investments in water supply projects.

***Keywords:*** Groundwater, Cost of illness, Damage cost, Averting behaviour approach, Household survey