

# Review of: "Saltwater Intrusion in Coastal Aquifers: A Comprehensive Review and Case Studies from Egypt"

Harshita Jain<sup>1</sup>

<sup>1</sup> Amity University

**Potential competing interests:** No potential competing interests to declare.

The article "Saltwater Intrusion in Coastal Aquifers: A Comprehensive Review and Case Studies from Egypt" gives a thorough review of saltwater intrusion (SWI) in coastal aquifers, with a specific emphasis on Egypt. It covers the basics of SWI, such as definitions, causes, factors, and management strategies. The study also looks at several modelling techniques and strategies for controlling SWI. The extensive case studies from Egypt clearly demonstrate the actual issues and solutions associated with SWI, providing significant insights into the country's distinctive environment. However, the essay may benefit from a more critical examination of the efficacy of various management systems, as well as a deeper investigation of creative approaches to SWI reduction. Overall, the review is well-structured and informative, adding greatly to our knowledge of SWI in coastal aquifers.

Comments for improvement:

The authors could investigate a variety of innovative approaches to SWI reduction, such as using novel materials and designs to build underground barriers, using advanced techniques for Managed Aquifer Recharge (MAR) with treated wastewater or stormwater, and incorporating green infrastructure such as coastal wetlands and permeable pavements. Furthermore, smart irrigation methods based on precision agriculture and IoT technology, as well as artificial recharge wells outfitted with modern filtration and desalination systems, provide intriguing alternatives. Furthermore, a more thorough assessment of management methods such as seawater desalination, groundwater management plans, and Integrated Coastal Zone Management (ICZM) is required. Evaluating desalination's long-term economic viability, environmental impacts, and energy consumption, assessing the adaptability and effectiveness of current groundwater management strategies, and analysing stakeholder integration and coordination in ICZM can all help to identify gaps and opportunities for improvement, resulting in more resilient and sustainable approaches to SWI mitigation.