

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

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Potential competing interests: No potential competing interests to declare.

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

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This manuscript is a valuable contribution to the understanding of the problem of saltwater intrusion. It provides a comprehensive overview of saltwater intrusion, its causes, consequences, and possible solutions. It highlights the importance of implementing sustainable water management practices to protect coastal aquifers and ensure long-term water supply security. The results presented in the manuscript are largely in line with the international scientific consensus on saltwater intrusion in coastal aquifers.

The case studies in Egypt show that saltwater intrusion is a complex problem that requires sustainable and locally adapted solutions. The results of the Egyptian study make an important contribution to the understanding of the phenomenon of saltwater intrusion in coastal aquifers. They confirm the trends observed internationally.

These case studies in Egypt have highlighted several key points:

The advance of the freshwater-saltwater interface: Numerical model results show that the interface between freshwater and saltwater is gradually moving inland, reducing the amount of freshwater available.

The impact of human activities: Excessive groundwater extraction and changes in land use are accelerating the salinization process. The vulnerability of coastal aquifers: Egyptian coastal aquifers are particularly vulnerable to saltwater intrusion due to their geology and anthropogenic pressures. From these studies, researchers have made several recommendations to manage this problem:

Reduce pressure on aquifers: Reduce groundwater pumping, promote the use of alternative water sources (surface water, desalinated water), and implement water conservation measures.

Improve water resources management: Establish integrated water resources management systems to optimize water use and reduce waste.

Continuously monitor groundwater quality: Establish monitoring networks to track salinization and detect early changes.

Develop numerical models: Use numerical models to simulate different scenarios and evaluate the effectiveness of management measures.

To improve the manuscript:

- Comparing the results of a specific study, such as the one presented in the manuscript, with international research on a subject as broad as saltwater intrusion is an essential step to validate the conclusions and identify global trends

- The bibliographic study at the level of Egypt is the most important part that should add value to the bibliography through

the constitution of a discussion topic: critiques and comparisons by the authors. No personal contribution from the authors apart from the raw bibliographic data

- It is important to note that scientific studies are often subject to variations depending on the methods used, the available data, and the spatial and temporal scales considered. Thus, there may be differences between the results of the Egyptian study and those of other research that had to be brought out in this bibliographic synthesis to validate this work.
- The components of a scientific article: summary, introduction, materials and methods, results and discussion, conclusion, recommendations, perspectives are not respected, and one has the impression of reading a scientific book and not an article.
- The study on saltwater intrusion in Egypt has several particularities that distinguish it from research conducted in other regions of the world. This study had to be justified by other arguments such as: 1. Specific geographical and historical context 2. Characteristics of Egyptian coastal aquifers 3. Water management policies 4. Methodological constraints
- Lack of maps: geographical, geological, hydrogeological.
- Some parts of the text need to be redone, such as the summary (no results are deduced from the manuscript and it rather looks like an introduction to the problem and recommendations)
- Change the title: instead of "in-depth study," I suggest "bibliographic review."
- Keywords: lack of "coastal zone" and "Egypt"
- . - In formula (1): h_s ??, H_f ??
- On several occasions, the author refers you to the reference, not for justification but for additional information.
- Fragmented text: several short subparagraphs.
- In subparagraph 8.7: the studies made by the authors (34,35, 36, 37, 38, 39, 40) could have been the subject of a comparison and discussion on the part of the authors and not the reader.
- What is the basis for the sampling of study sites? The heterogeneity of the parameters is a source of bias in the results.
- You are talking about the intrusion of saltwater; other causes, such as irrigation, must be eliminated.

Manuscript requiring additional efforts to synthesize it.

Sincerely.

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