

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

The Abstract presents the aim of this review article, it is clear and show the article plane.

Keywords: covers the main sections of the article.

1. The introduction showed the important and sources of Groundwater and its role in providing water for many purposes.

2. Definition of Saltwater Intrusion

The authors briefly define the phenomena of SWI

3. Handling Saltwater Intrusion Issue

The authors provide numerical models developed based on two main assumptions,

Sharp Interface Models and Diffusive Interface Models. They explain the assumptions of each model.

4. Main Causes of Saltwater Intrusion

The authors mentioned causes of occurring SWI.

5. Factors Affecting Saltwater Intrusion

They mentioned 3 categories, local scale, regional scale, and global scale. They repret these categories in a flow chart.

6. Monitoring of Saltwater Intrusion

Here the authors provided 4 techniques that can be used for this purpose:

6.1. Groundwater Head Measuring

6.2. Geophysical Investigation

6.3. Geochemical Investigation

6.4. Isotopic methods

7. Management Tools

The management techniques are provided to understand the process of SWI.

The authors present a summary of some of techniques:

7.1. Remote Sensing

7.2. Field Surveys

7.3. Modelling Methods

They presented a flow chart with 3 modelling techniques: Physical modelling, analytical modelling, and numerical modelling.

7.4. Computer Codes

7.5. Optimization Techniques

The authors provide flow chart for these techniques in Fig. 6.

8. Countermeasures to Control Saltwater Intrusion

They introduced the main methods for controlling SWI in coastal aquifer systems as follows:

8.1. Increasing Recharge of Groundwater

8.1.1. Natural Recharge

8.1.2. Artificial Recharge

8.2. Land Reclamation

8.3. Use of subsurface barriers

8.4. Reduction of Pumping Rates

8.5. Relocation of Pumping Wells

8.6. Abstraction of Saline Water

8.7. Abstraction, Desalination, and Recharge (ADR)

The authors provided a schematic drawing showing different countermeasures to control saltwater intrusion

9. Case studies from Egypt

In this section, the authors presented many studies about the SWI for different researchers in Egypt.

10. Limitations and Future Studies

They provided some limitations about applying protection techniques and suggested recommendations for future research.

11. Summary and Conclusion

The authors presented a summary and conclusion of their work.

References

They presented 72 recent references covering the whole sections of the review article.

They may add the following 2 references:

1. El Maghraby MMS 2014 Geochemical and Isotopic Evidence of Seawater Intrusion into the Shallow Pleistocene Coastal Aquifer, West Alexandria, Egypt *Life Sci. J* 2014; 11(7):749-762.
2. El Maghraby, M.M.S., El Fiky, A.A. & Nawar, A.F. Hydrogeophysical investigations on the Pleistocene aquifer, Kom Hamada area, West Nile Delta, Egypt. *Arab J Geosci* 7, 3839–3853 (2014). <https://doi.org/10.1007/s12517-013-1047-6>

Thank you