Review of: "Groundwater Potential Zone Assessment Using Remote Sensing, Geographical Information System (GIS), and Analytical Hierarchy Process (AHP) Techniques in Fogera Woreda, South Gondar Zone, Ethiopia"

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Potential competing interests: No potential competing interests to declare.

Review

Title suggestion: Assessing Groundwater Potential Zones in Fogera Woreda, South Gondar Zone, Ethiopia Using Remote Sensing, GIS, and AHP Techniques

ABSTRACT

Suggestions:

1. A more precise objective could clarify the intended outcomes or implications of the study, such as "to assess and map the groundwater potential zones for sustainable water resource management."
2. While the abstract mentions using AHP, remote sensing, and GIS, it could briefly specify why these methods were chosen over others, highlighting their relevance or advantages in this context.
3. The abstract effectively quantifies the areas of different groundwater potentials. However, it could enhance reader understanding by briefly explaining what criteria or thresholds define the categories of 'excellent,' 'moderate,' 'poor,' and 'extremely poor' groundwater potentials.
4. The results are stated in percentages, which is clear, but the abstract could briefly mention the actual implications of these findings. For instance, how does the distribution of these potential zones affect local water resource management or agricultural practices?
5. The statement about the study's value for decision-making and strategy development is very general. It could be strengthened by specifying types of decisions or strategies, such as irrigation planning, drinking water supply enhancement, or drought resilience strategies.
6. The abstract lacks a concluding sentence that synthesizes the overall significance of the research. Adding a sentence that encapsulates the broader environmental or socio-economic impact of the findings could provide a compelling end to the abstract.

INTRODUCTION

Suggestions:

1. The first sentence could be simplified to make the definition of groundwater more straightforward. For example: "Groundwater is water that occupies the void spaces within geological formations, which act both as reservoirs and conduits for water flow."
2. The introduction is dense with information. Consider breaking it into more manageable paragraphs, each focusing on a specific aspect: the importance of groundwater, factors affecting groundwater presence and movement, the role of modern technologies in groundwater research, and the specific aims of your study.
3. While citations are used to support statements, ensure they are seamlessly integrated. For example, instead of listing authors and dates in succession, blend them into the narrative more naturally, perhaps by summarizing the research trends or key findings they contribute to.
4. The aim of the study is mentioned towards the end but could be highlighted earlier and more clearly. A clearer, more direct statement of objectives near the beginning can help orient the reader. For example: "This study aims to use geospatial and Analytical Hierarchy Process methods to map the groundwater potential in Fogera Woreda, thereby addressing the increasing water demand due to population growth."
5. Highlight what makes your study unique or critical compared to previous studies. Emphasize the innovative aspects of your methodology or the specific challenges of the region that your study addresses.
6. Provide a brief background on the specific challenges faced in Fogera Woreda due to water scarcity. This helps to establish the relevance and urgency of the research.
7. The introduction briefly mentions the implications for policymakers but could expand on how the study's findings could impact water resource management strategies, agricultural planning, or urban development within the region.
8. Ensure that technical terms like "lithological stratum" or "lineament density" are accessible to readers who might not be specialists in geosciences. A brief explanation or simplification of these terms could be beneficial.

RESULTS AND DISCUSSION

Suggestions:

1. The section could benefit from better organization to enhance readability. Grouping related themes or creating subheadings for each thematic layer discussed might help maintain a logical flow and keep the reader engaged.

2. Some parts of the text are repetitive or overly detailed, which could potentially distract from the main findings. Streamlining the content to focus on key results and implications might be more effective.

3. Although the results are well presented, the discussion could further elaborate on the practical implications of these findings. How do these results impact local water management practices? What are the specific recommendations for policymakers?

4. It could be beneficial to include more detailed statistical analysis results, such as confidence intervals or measures of variability, which could provide deeper insights into the reliability and robustness of the results.

5. Expand on how these findings compare with other regions with similar geographical and climatic conditions. This could

enhance the generalizability of the study's conclusions.

6. Briefly mention potential future research directions based on the findings of this study. For example, investigating the impact of climate change on these groundwater potential zones could be a valuable next step.

CONCLUSION

Suggestions:

1. The conclusion should ideally reconnect with the study's objectives to demonstrate how the findings address the initial research aims. This can reinforce the relevance of the results and give the conclusion a more rounded feel.
2. While it mentions the percentages of areas with varying groundwater potential, the conclusion could expand on what these findings imply for water resource management in the study area. How can these results be utilized by local authorities or in planning and development strategies?
3. The conclusion could benefit from suggestions for future research or applications of the findings. What are the next steps that could be taken based on this study? Are there areas within the region that require more detailed exploration?
4. It could also discuss the potential impacts of these findings on local communities, agriculture, or industry, providing a more comprehensive view of the study's significance.
5. Mention how these findings fit into the broader environmental or economic context of the region or similar regions globally.
6. Briefly touch on any technological advancements or innovations in geospatial and AHP techniques that could enhance future groundwater studies.
7. Discuss how these findings could inform conservation strategies or sustainable water use practices in the region.

REFERENCES

Suggestions:

The list of references provided for the scientific article on groundwater potential appears well-cited, covering a range of studies relevant to the use of GIS and remote sensing techniques in hydrology.

1. Your references span from 1996 to 2022. While it is important to cite foundational research, ensure that the most current research is also well-represented, particularly in fields involving rapidly evolving technologies like GIS and remote sensing. The inclusion of more recent studies (post-2015) is good, but consistently updating this with the latest research until the current year would be ideal.
2. The sources are predominantly well-regarded journals, which is excellent. However, ensure that all sources are peer-reviewed and are considered authoritative in the field. For instance, the reference from "www.stmjournals.com" should be checked for credibility if it's not well-known.
3. The references cover studies from various geographic regions, which is suitable for a study attempting to apply methods universally. However, if your study focuses on Ethiopia, additional region-specific studies, if available, should

be emphasized to contextualize your findings better.

4. Make sure all entries in the reference list are consistently formatted.
5. Providing DOIs is excellent for accessibility and verification of digital documents. Make sure that all DOIs are correct and lead to the actual publication.

Example to improve:

- Original: "Doke, A. B., Zolekar, R. B., Patel, H., & Das, S. (2021). Geospatial mapping of groundwater potential zones using multi-criteria decision-making AHP approach in a hard rock basaltic terrain in India. Ecological Indicators, 127(September 2020), 107685. https://doi.org/10.1016/j.ecolind.2021.107685"

- Improved: "Doke, A.B., Zolekar, R.B., Patel, H., & Das, S. (2021). Geospatial mapping of groundwater potential zones using a multi-criteria decision-making AHP approach in a hard rock basaltic terrain in India. Ecological Indicators, 127, 107685. https://doi.org/10.1016/j.ecolind.2021.107685"

1. Completeness - Rating: 4

2. Clarity-Rating: 3.5

3. Methodological Rigor - Rating: 4.5

4. Relevance - Rating: 4.5

5. Overall Rating - Rating: 4

average - 4.1