Review of: "MCDA - Groundwater prediction analysis for Sustainable Development using GIS Supported AHP in Okeigbo, Southwestern Nigeria"

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Potential competing interests: No potential competing interests to declare.

The research topic is very interesting, however, i have the following observations:

1. There is a need to clearly demarcate weathered/fractured zones from the fresh basement zone in Quartzite, Quartz schist, and Metadiorite region. This is because Quartzite and Metadiorite rocks are not typically considered aquifers, meaning they don't have the ability to hold and transmit significant amounts of water. However, they can play roles in influencing groundwater movement and storage.
2. A lot of favourable estimated hydraulic parameters for rocks such as Quatzites and Matadiorite in the study area that are known to have very low porosity and permeability are sort of confusing and misleading.
3. The work was conducted in a basement environment where the supposed aquifers should be fractures and not the entire lithology as a whole. This fractures are often verticals and sub-verticals in geometry. Characterizing the entire basement rock as an aquifer in the study area may be misleading.
4. The porosity of the supposed aquifers should be estimated and maps should be produced.
5. Figure 9 is sort of regional, the figure should be adjusted to only show the stream networks passing through the study area alone.
6. In Figure 11, Weathered/Fratured basement should be separated from the fresh basement.
7. Looking at the Table 3, Table 4, and Figure 15, one can see that the depths of the borehole wells are within the overburden zone. These show that the whole interpretations are within the overburden zone that are predominantly clay, clayey sand, and sandy clay. These aquifers will have variation in porosity and permeability values due to variation in clay contents. The authors should please not interprete the geology (as shown in Table 3) as Quartzite, Quartz Schist, and Metadiorite, as the depth extents show that these productive zones are quite within the overburden zone.
8. Basement aquifers differ from typical sedimentary aquifers, which are composed of layers of porous sedimentary rocks like sandstone or limestone. In contrast, basement aquifers are often characterized by the fractured nature of the crystalline rock, which provides the primary pathway for groundwater storage and movement. The permeability and productivity of basement aquifers can vary widely depending on factors such as the density and connectivity of fractures, the degree of weathering, and the mineralogy of the rock. Can we havefracture density and networks models within the basement complex of the study area.