Differences between chemical properties of rain water and well water

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ABSTARACT

Rain water and well water are used for drinking and agriculture. This study investigated their conductivity and pH using samples from Madinah city, Kingdom of Saudi Arabia (KSA). The study found both type of water was alkaline with small differences. Conductivity of well water was higher than that that measured of rain water. More samples from different areas of Al-Madina city should be tested to confirm these results.

Key words

Rain water - Well water - Conductivity - pH.

1. Research Question and Hypothesis

When rain fall it run on earth surface to feed rivers or lakes ends up in seas and oceans. Part of the rain water penetrates soil and rocks to form groundwater reserves (A summary of the United Nations World Water Development Report 2, 2006). Hence, rain water is one of the main resources of drinking water for human and animals and growing plants in KSA. Groundwater could be extracted as wells. This study investigated the differences between rain water and well water in two properties, conductivity and pH. value despite the fact that wells water is originated from rain water. The study proposed that rain water and well water differ in conductivity and pH values.

2. Materials and Methods

100 ml of rain water was collected from the site located in the West area of Al-Madinah city, KSA (Figure 1.). 100 ml of well water was also collected from a well located 90 km west of Al-Madinah. One sample was tested from both water types for their conductivity and pH. Globe protocols were followed to measure both conductivity and pH. Globe instruments provided by Globe for both measurements.

Figure 1. Site of the school where rain water were collected.

3. Data Summary

Table 1. Conductivity and pH of rain water and well water.

Water type	Conductivity	pH
Rain water	480	8.4
Well water	590	8.7

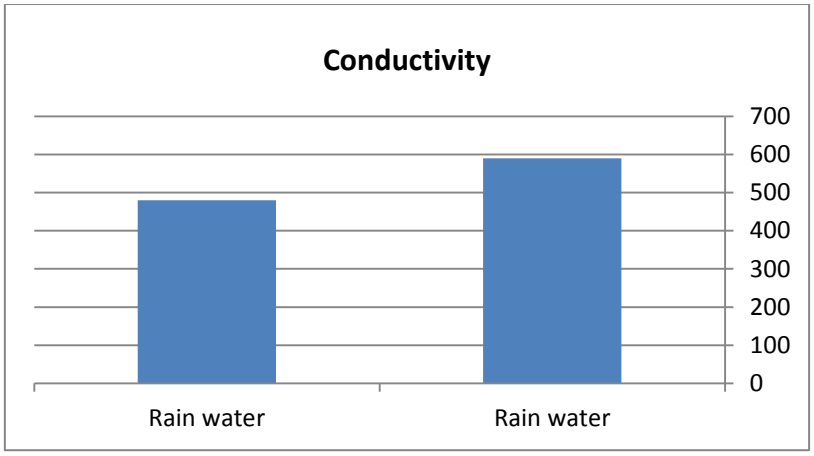

Figure 2. Conductivity of rain water and well water.

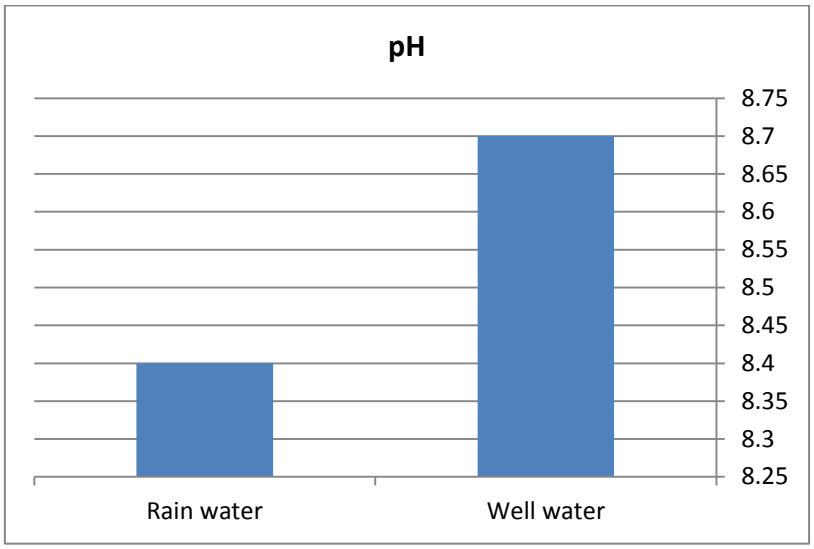

Figure 3. pH of rain water and well water.

4. Results, Discussion, and Conclusion

The study found that conductivity of well water was higher than conductivity of rain water (Table 1and Fgure 2). Conductivity refers to the amount of salts dissolved in water. The higher conductivity, the higher dissolved salts are (https://www.daf.qld.gov.au/business-priorities/plants/fruit-and-vegetables/farm-management/interpretation-of-water-analysis-for-irrigation). So that means well water have more salts than rain water (https://www.waterboards.ca.gov/water_issues/.../docs/.../3130en.pdf). That could be because of well water have more contact with rocks dissolving minerals from them.

pH of both types of water was slightly alkaline (Table 1and figure 3). But, well water had higher pH than rain water although the difference between them was small. That could be explained again by well water having more alkaline minerals that raise its pH (https://www.watersystemscouncil.org/download/wellcare_information_sheets/potential_groundwater_contaminant_information_sheets/9709284pH_Update_September_2007.pdf).

Difficulties

It was difficult to have more than one sample of rain water because the amount of precipitation was low in Madinah city and most of it was lost due to evaporation. More samples well improve further studies.

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