Study of the characteristics of water resources and their suitability for agriculture in Al-Deriz village (Ibri)

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Abstract

This research was applied in the village of Al-Dreiz in the Wilayat of Ibri, to study the causes of the problem through field visits and questioning some of the villagers, as well as interviewing some farmers to deduce a problem for the study.
Through this, it became clear to us that farmers and residents are suffering from a sudden increase in the salinity of groundwater. Compared to the salinity of the waters (Note that the salinity of Al-Masarat water was previously higher than that of groundwater).
The main water sources in the village are Al-Masarat water and groundwater, and the acidity of the groundwater and Al-Masarat water was almost moderate (as the proportions were close to each other). Through the samples taken from the groundwater and Al-Masarat water, we applied the water protocol in the school laboratory to measure the salinity and acidity properties of the water samples. The research results indicated that there is a difference in the properties of the water, as it indicated the following:
The characteristics of the groundwater were different from those of Al-Masarat water; the salinity was higher in the groundwater (716ppm), in contrast to that in the water of Al-Masarat, where it was approximately (515ppt), and the acidity of the two types of water was similar and moderate (ranging from 8pH to 8.80pH).
Based on the research results, the researchers recommend that the relevant authorities intensify campaigns to monitor and examine the characteristics of groundwater and well water to determine their suitability for agriculture, as well as to ensure that citizens are aware of the use of modern irrigation methods, while setting guidelines to protect the water protocol from pollution that may result in a change in the basic characteristics of the water.

Abstract

At the first, we identified the sources of water in the village, and we found that; the well water was the most common in terms of use. We concluded that farmers and villagers suffer from the problem of high groundwater salinity. Then, we conducted interviews with farmers and residents of the village to identify the reasons that might have led to this and to collect information about the research topic from various sources.

Second, samples of both types of water were taken, and the water protocol was applied in the school laboratory, and the well site (for groundwater) was visited. The maps below show the geographical location from which both the well water (groundwater) and Al-Masarat water samples were taken.

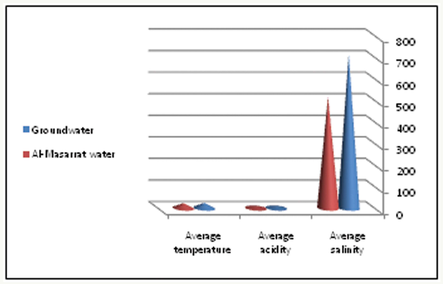
Third, the work of each student in the team was determined through a schedule that specifies the work of each student and the protocols that they will implement.

Research questions

- What are the reasons for the high salinity of groundwater in the village of Al-Deriz?

- What is the difference between the salinity and acidity of groundwater and well water? Which is more suitable for agricultural use?

Results



Flowchart (1): Comparison of Water Protocol Properties (Software Hardware)

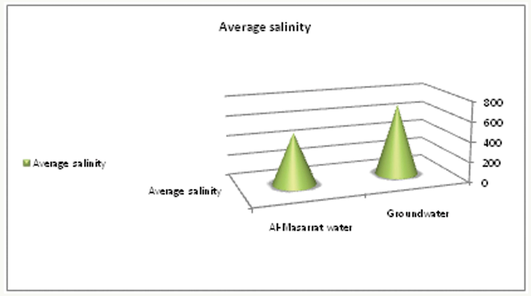


Chart (2): Comparison of salinity characteristics (store devices)

Abstract

In this research, we tried to identify the salinity and acidity characteristics of both types of water in the village, their suitability for agriculture, and the reasons that may have led to the current high salinity of groundwater. We conducted a practical experiment in the school laboratory. So, we took water samples to examine them with different devices in the Sahara Al-Masarat store, as well as field visits to the farms in the village.
We concluded that:
External factors affecting the depletion of large quantities of water during consumption, which is a factor that greatly affects the increasing of water salinity, and there are may be some other human factors that have affected the changing of water properties.
From this, we conclude that the properties of well water differ from the properties of groundwater, as:
-Properties of Al-Masarat water: Moderate salinity and moderate acidity (alkaline water).
-Properties of groundwater: Very high salinity and moderate acidity (alkaline water).
Based on these results, the researchers recommend:
-All segments of society are working hard to find solutions to the problem of high groundwater salinity in the village.
-Requesting the concerned authorities in each governorate to follow up on the water characteristics in the villages from time to time, and to provide the farmers' requirements for following up on the water characteristics.
-Conduct other research in different places to compare the results which have been obtained.

Introduction

The problem of high water salinity is considered one of the most important environmental problems at the present time, and the residents of Al-Dhuwairiyah villge suffer from a sudden increase in the salinity of groundwater, as the salinity of groundwater was moderate in the last three years. What is meant by high water salinity is the increase in the percentage of salts in the water, which sometimes makes it unsuitable for agricultural use.
Groundwater in the village is almost the secondary source after Al-Masarat water, as most farmers depend on groundwater to irrigate their crops. Therefore, the high salinity of groundwater poses a threat to the life of crops.
Some of the wells in the village had previously dried up due to the lack of rainfall, as rainwater is a major source of groundwater in the village. The drought lasted for about a month or more, but after that, thanks to God, water returned to the wells again, but with environmental problems that we had not known before, such as high salinity of the water.

Therefore, this topic was chosen for study to ensure the suitability of this water for agriculture, and to identify the reasons leading to the high salinity of groundwater in the village by applying the water protocol.
God willing, in this study we will try to reach correct conclusions, to contribute in solving this environmental problem.

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