

Investigating the loss of water from government distribution networks in Samail State, its effects and the possibility of utilizing it

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Research Questions

- The current study sought to answer the following questions:
1. How much water is lost through the leakage of the water of government distribution networks?
 2. What are the effects of leakage of government distribution networks on the environment?
 3. What are the hydrological specifications for the water of government delivery networks? How can leak sites be utilized?

Research Procedures

- Identifying and reviewing the related literature of the research topic and document them.
 - Selecting and identifying study sites in preparation for the start of data collection. (Al-Madrea, Khobar, Al-Nuaima/Samail State).
 - Determining the appropriate protocols for collecting research data, mainly the water protocol and the soil protocol.
 - Determining the appropriate devices and tools to be used in the application of the protocols and select the necessary data. These devices include transparency tube, conductivity scale, pH meter, GPS, cups, water, paper, pen, smartphone, sample collection boxes, sieve, sensitive balance, stirring rod.
 - Administrating a questionnaire using Google Forms and publishing it via social media apps to the people of the State to gather the needed information and examine the existence of the problem in the stat. (Random sample was 108 respondents)
 - implementing the prescribed protocols to samples taken from the specified sites.
 - Collecting data and organizing it into tables.
 - Inserting the data at the program site. (www.GLOBE.gov)
 - Analyzing the collected data.
- Discussing the results and the recommendations

References

E-Government Development Index, Water, Electricity and Sanitation. Retrieved on 5 February 2021 from <https://omanportal.gov.om/>
GLOBE Environmental Technical Office, (2012). Field Study of Soil Research Environmental GLOBE Program
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Abstract

The aim of the study is to investigate the loss of water from government distribution networks in the State of Samil, its effects and the possibility of utilizing it..

The research was applied to several sites for water leakage of distribution networks in Samail State. The water protocol for leaking water was applied, the rate of leakage occurred at the study sites was calculated, and the soil protocol was implemented to sample from three sites of topsoil (5-20 cm) during which the water seeps. A questionnaire was also administered to a random sample of the state's population, in addition to observing and identifying some of the effects of the leaking water.

The results revealed a large amount of water loss through the leakages of government distribution networks where the average daily loss in some locations was estimated to be (11-30) gallons. Direct observations of leak sites and responses to the questionnaire also showed that the leak had effects on the buildings extending to them such as cracks on asphalt roads and some holes. The soil at the study sites was characterized mostly by a simple alkaline (pH = 8.3) and an easy-to-turn granular structure with clay tissue, which could be utilized in these sites for the cultivation of certain plants, especially if it is among the sites where leakage occurs frequently. The researchers recommend that the size of leaks in the water of government distribution networks should be reduced by continuous follow-up and rapid handling of leakage sites, as well as the possibility of exploiting frequent leakage sites in agriculture.

Results

Soil Sample	Location 1	Location 2	Location 3
Rocks	Many	medium	medium
Roots	None	many	many
Soil structure	Full-intermittent	granular	granular