

# **GLOBE OMAN**

**The death of aquatic and plant organisms in the laboratory of  
Umm Thar Al-Ghafari School**

**/ Done by**

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## Abstract

The research aims to study the cause of the death of aquatic organisms that are raised in the school laboratory and the withering and death of plants that are cultivated and taking care of them in the school laboratory of Umm Dhar Al-Ghafari School with the availability of all the appropriate factors for plant growth of water, light, air and warmth. The GLOBE Environmental Program will implement the water protocol to know the characteristics of water and follow it up to ensure its impact on these organisms according to the Omani standards for water, study the vegetation protocol, as well as conduct a microbiological examination in cooperation with the municipality, Department of Water Analysis Laboratories. After applying the water protocol, it was noted that the water's properties are good in terms of salinity and conductivity, and slight differences in the pH of the water, but the problem lies in the great lack of oxygen in a way that is not commensurate with the Omani water quality standards, and during the results of the microbiological examination, the beginning of the emergence of a type of bacteria in the water was discovered. Consequently, cooperation was made with the Health Awareness Department in Al Buraimi Governorate and the STEM team, to search for the causes of oxygen deficiency in the school laboratory water and treat the problem. Research recommendations: Avoid chemical pollution of water by wiring the water with pipes made of thermal polypropylene, expanding the project to reach old homes, and assisting them in examining and treating water problems.

- **Research questions:**

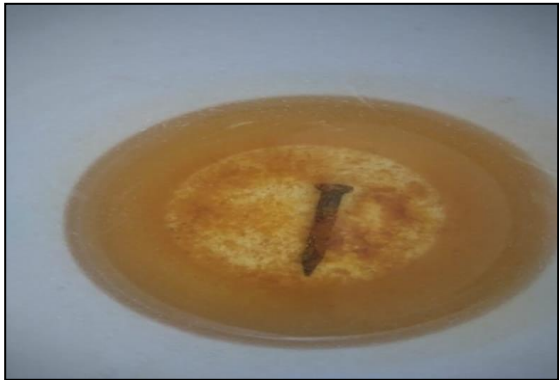
- 1. What is the cause of the death of aquatic and plant organisms in the school laboratory of Umm Thar Al-Ghafari Basic Education School?**
- 2. What is the reason for changing the properties of the water, the ratio (salinity, conductivity, pH, percentage, oxygen, perceptible characteristics, color, smell, taste, absence of microbes)?**
- 3. What are the solutions to treat this phenomenon?**



• **The time plan for preparing the research is as follows:**

Notes	Implementation Officer	the plan	the month
Addressing the authorities assigned to the school correspondence system	Mayassa Al-Rashidi, in cooperation with the GLOBE team and supervisor	<p>Defining the problem</p> <p>*Correspondence to water resources</p> <p>*Provision of project tools (and provision of water protocol tools, fenugreek seeds and legumes, aquatic organisms (fish and tulip(</p>	Nov
<p>Project tools provided</p> <p>Apply hydration protocol twice a week</p>	Student Noura Al-Rashidi in cooperation with the GLOBE team with the municipality, the hospital and the STEM team	<p>Application of the (water) protocol in the specified locations for the study</p> <p>Microbiological analysis of water in cooperation with the municipality</p> <p>Analyze data and find solutions, in cooperation with the competent authorities, make recommendations, write and review the research.</p>	Dec
<p>The cost of the poster is approximately (15) riyals</p> <p>Conducting seminars and lectures in cooperation with the school specialist</p>	Mayassa Al-Rashidi	<p>Data entry into GLOBE website</p> <p>Business Poster</p>	January
	Maysa Al-Rashidi + Noura Al-Rashidi Supervising GLOBE supervisor	Writing the research and participating in the research in a competition at the governorate, Sultanate and international levels	March





Visiting the hospital to collect information and statistics and learn about the impact of polluted water on an individual's health



Visiting the municipality and the specialized engineers to study the problem and develop solutions



Researching learning resources on the topic and searching for solutions to the problem



- **First: First experience: Why do plants die when grown in the school laboratory?**

- Table (1) Results of the experiment of the effect of water source on plants

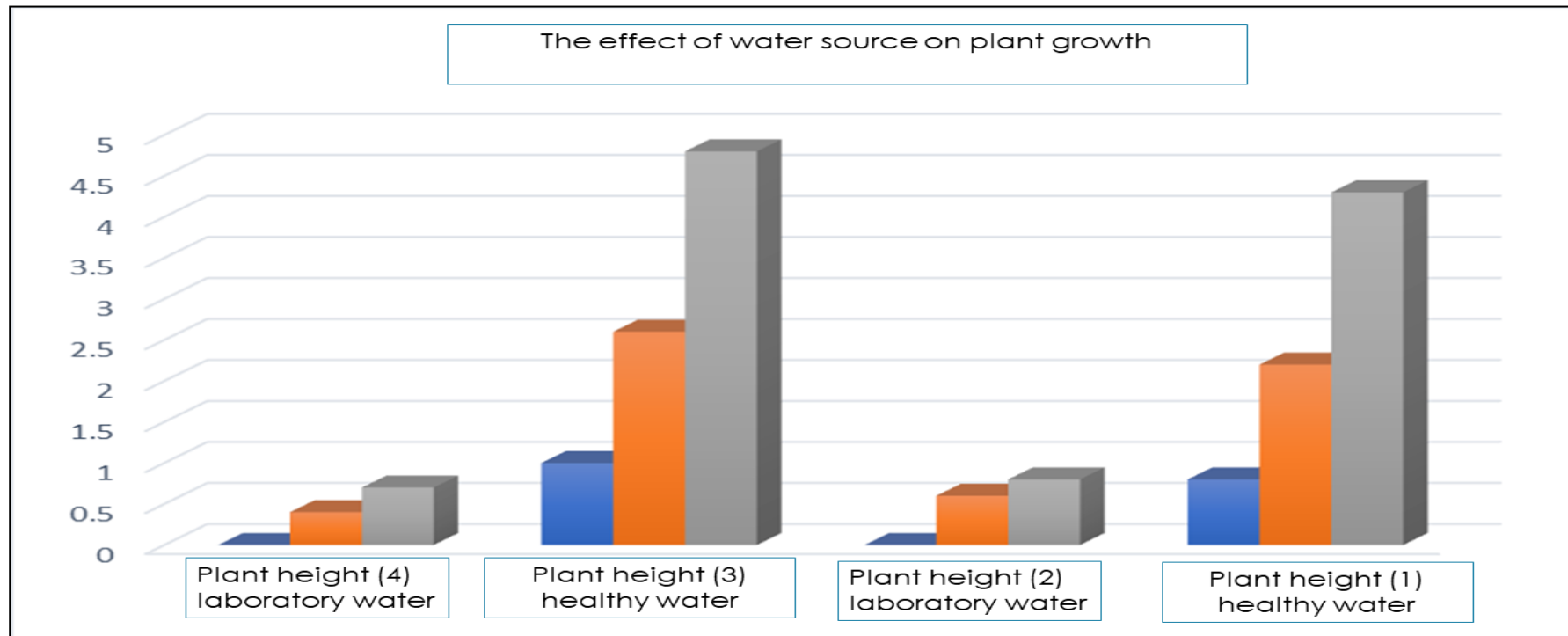
Water from a laboratory faucet						Healthy water						Duration
Pots(4)			Pots(2)			Pots(3)			Pots(1)			
The appearance	The number of seeds that have grown	Plant height (cm)	The appearance	The number of seeds that have grown	Plant height (cm)	The appearance	The number of seeds that have grown	Plant height (cm)	The appearance	The number of seeds that have grown	Plant height (cm)	
Some seeds rot	0	0	-	0	0	Healthy green	5	1	Healthy green	4	0.8	
yellowish	1	0.4	yellowish	2	0.6		5	2.6		5	2.2	second week
light green	2	0.7	light green	2	0.8		5	4.8		5	4.3	the third week



# The second experiment: why do aquatic organisms die in the school laboratory?

Table (2) Results of the experiment of the effect of water source on aquatic organisms

Water from a laboratory faucet		Healthy water		Duration
Aquarium(4)	Aquarium(2)	Aquarium(3)	Aquarium(1)	
Abu Danaiba died	The fish died	Adenibiah is in good health	Fish are healthy	Passage of 24 hours

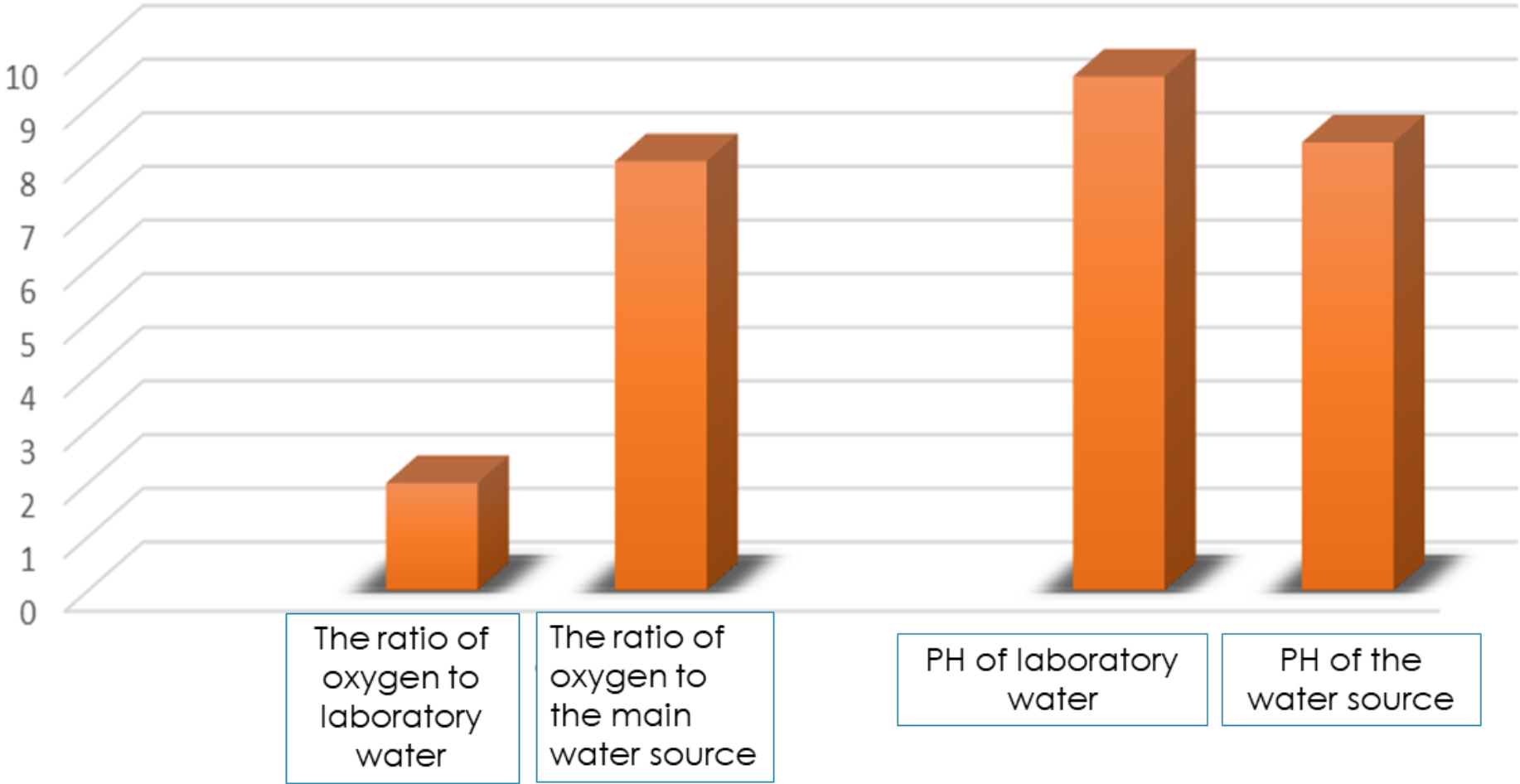


- **Fourth: Conducting a microbiological analysis of water in cooperation with the municipality, Department of Water Analysis Laboratories**

- Date of COA :14/11/2020
- Table (4) the results of the microbiological water test for the laboratory tank

NO	Parameter	Results	Specification
1	Coliform	12.4	0
2	E.Coli	0	0
3	Visual Examination	Normal	Physical
4	Total Dissolved solid	140	100<R(mg/l)<1000

Comparison of water source characteristics (government water, laboratory water)



- **Discuss the outcome:**

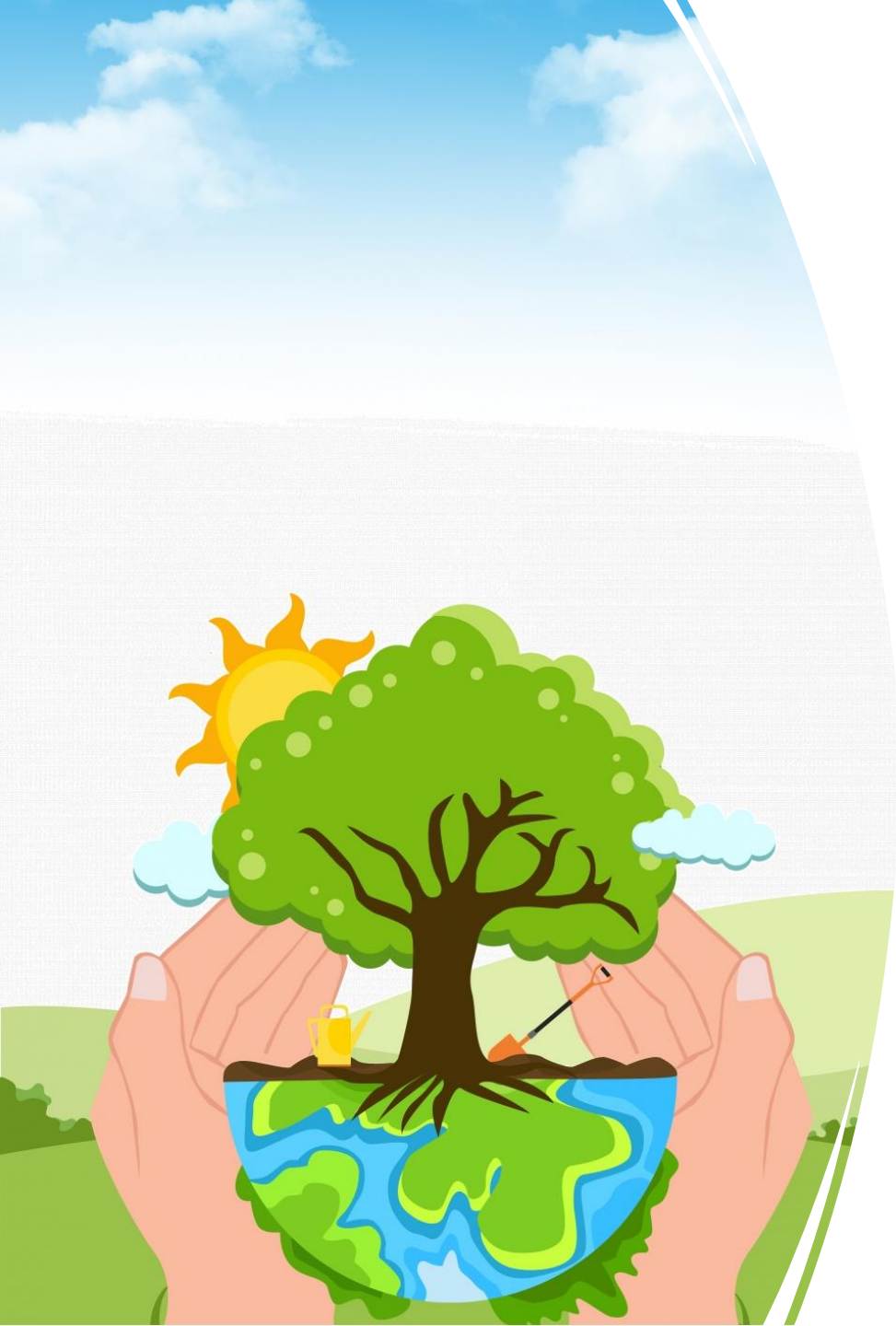
- Through the measurements and readings that were taken in Table No. (1) and Table No. (2), it is clear that the cause of death of aquatic organisms and plants that are grown in the laboratory is water. It contains a low percentage of oxygen. Table (4) shows the microbiological analysis of laboratory water in cooperation with the municipality, the Water Analysis Department, with the presence of (12.4) of coliform bacteria in the water, and this is the answer to the first question.
- By comparing the characteristics of the water from the main source, the governmental water for the school that pours into the school tank shown in Table (5) and the water that comes down from the laboratory faucet, Table (3), it was found that there is a difference in the pH and the percentage of oxygen in the water, and the reason is that the water is silent in the school It is nothing but rusted and worn iron silks, as the reaction of iron with dissolved oxygen to form iron rust ( $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ) is the reason for the lack of oxygen in the water and a reason for the stench in the water and the growth of bacteria even though the water that reaches the reservoirs is of high quality, and to be sure The formation of rust is the cause of the lack of oxygen in the water.
- As for the answer to the last question of the study, it was through a meeting with a nutritionist at Al Buraimi Hospital who explained the health effects of iron rust on human health from skin sensitivity (eczema), stomach germs and nausea, and a negative impact on other organisms, and through a meeting of the municipality department and the STEM team in the governorate to study Ways to treat the problem, so it was agreed to search for a funder from the community members to replace the school pipes, but the problem was that the old wires inside the school walls and it is difficult to replace them because that would require breaking the wall, and after studying the issue with the engineers it was agreed to make external wiring from the tank that goes directly to Drinking fridges, laboratory taps, and school toilets.

# Conclusion:

In this research, the researcher relied on the procedural approach to solve the problem of the cause of death of aquatic and plant organisms in the school laboratory by applying the application of the water protocol and microbiological examination in cooperation with the municipality in the school environment, and the problem was also engineered in cooperation with engineers from the municipality department and the STEM team in the governorate to find a way to solve The problem, as well as making interviews with a nutrition technician at Al Buraimi Hospital, from which we came out with the Eid recommendations for the community, including:

- •Continuous chemical analysis of water used for drinking and watering living organisms, especially in old homes.
- Avoid chemical pollution by wiping water with pipes made of thermoplastic polypropylene.





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