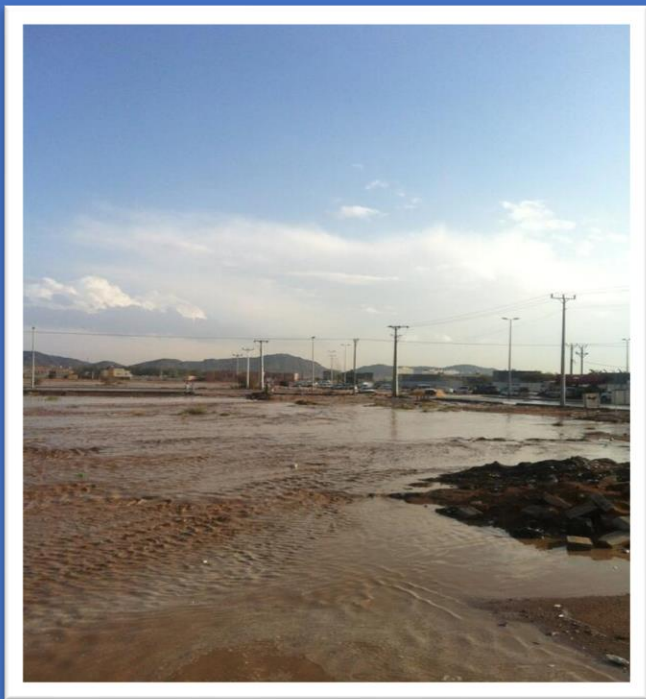


A STUDY OF THE EFFECT OF AQUATIC MICROBIOLOGY ON PROMOTING HEALTH, REDUCING DISEASE AND EXTENDING LIFE IN SUWIFLEH WATER IN HAIL .REGION



[Document subtitle]

A STUDY OF THE EFFECT OF AQUATIC MICROBIOLOGY ON PROMOTING HEALTH, REDUCING DISEASE AND EXTENDING LIFE IN SUWIFLEH WATER .IN HAIL REGION

Research presented at GLOBE International Virtual

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Summary of the Research

This research, entitled "The study of the effect of Aquatic Microbiology on health promotion, reducing disease and prolonging life in Suwifleh water in Hail region"

Hence pollution negatively affects agriculture and daily uses in the Suefila region, as water loses its natural properties in that area, and we have noticed that the suffering of the population is increasing from stagnant polluted water, and some residents of the region believe that the water is contaminated with the coliform colon bacteria, and with increasing rainwater the proportion of water increases swamps which causes damage to the population, epidemics and unpleasant odors.

The study aimed to identify the effect of Aquatic Microbiology on promoting health, reducing disease and prolonging life in Suwifleh water in Hail region.

The researchers used the experimental method and the research tools included the observation (we recorded two observations during a five-day period from 20 to 25 February) and we paid careful attention to the changes in the swamps concerned and we took accurate and clear pictures through the camera of the swamps and organized a questionnaire that was applied to a random sample of the affected population and non-residents. In addition, conducted interview in person with 4 people from the region. The laboratory analyzed 2 samples from the swirling

water. The samples were analyzed according to the bacteriological methods of the approved measurement of drinking water.

After verifying the validity of the questionnaire and analyzing it using statistical methods, we reached the following results:

- 1- There is a direct relationship between the presence of swamps and the presence of the risk of bacterial infection for the nurse.
- 2- The presence of a direct relationship between the wastewater and the presence of a bacterial contamination rate, which is apparent in Al-Suwifleh water, where , the percentage exceeds 47.8%.

In the light of these results, the study recommended the most prominent practices and to take appropriate means from Health and Environmental officials that ensure the quality of the Swalifah water and its suitability for agriculture and drinking (and the protection of water of AL-ADERA) that serve the region.



Figure1



Figure 2

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Illustration of the contents of the research

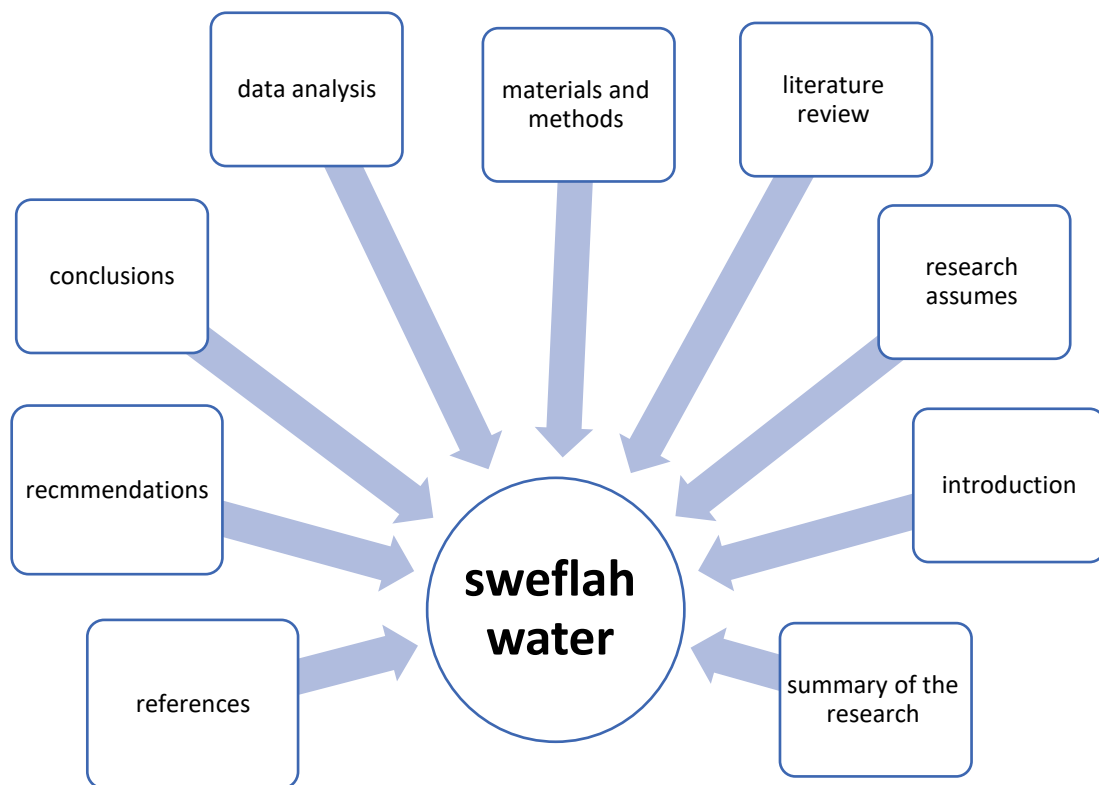


Figure 3 mind map of the content

Introduction

Water plays an important and essential role in human civilization and progress. It is needed for drinking, preparing food, bathing, cleaning, and irrigating crops and crops in addition to many other purposes. The term aquatic microbiology is called the science that deals with microorganisms found in all types of water, while the term Water Microbiology on the science that addresses the microorganisms present in Potable Water used for drinking purposes. About two and a half billion people do not have access to clean drinking water.

Raw Water may contain many pollutants that it reaches through wastewater. It is worth noting that many pathogenic and infectious organisms have their origin or their source of water, so to combat these diseases, this water must be treated to remove all pollutants, whether microorganisms or harmful chemicals

This is what Suefleh neighborhood suffers from, which is one of the governorates of the city of Hail previously, and now it is one of the city neighborhoods, as the sources also mention that the Suwayfilah is cut by Wadi Al-Adraa and the water of Al-Adraie is closer to being water that is not suitable for drinking or other uses recently, and it was valid for the use of living organisms since ancient times.



Figure 4 sweflah diagram

Research question and hypotheses

research question :

What is the effect of the study of Aquatic Microbiology on promoting health, reducing disease and prolonging life in Swefelah water in Hail?

The motive behind this research was to verify the cause of the presence of bacteria that exist only through sanitation and residues of living organisms in the water of the Suwifleh area, and the reason for the municipality of the region for preventing farmers from selling vegetables and fruits, especially leafy vegetables, even though they denied the existence of a percentage of wastewater in them, what is the reason behind stop them? What is the truth of that?

Understanding the conditions that made Suefila water (Wadi Al-Aderaa) contaminated with the most dangerous types of bacteria that have important safety implications



Figure 5. Swamp Water in Wadi Al-Adrieh Al-Swafilah, Hail, 26 February 2020

Research hypothesis

Reducing the presence of bacteria (bacteria) will increase health promotion, reduce disease and prolong life in Swefelah water in Hail region

The delay in the completion of sewage networks and their actual introduction to the service has contributed to serious environmental repercussions on Wadi Al-Adera, represented by diverting the polluted and polluted wastewater to it, leading to complete pollution and damaging the neighborhoods nearby. One of the serious mistakes committed since the beginning of the problem is that they set a way to drain sewage that passes through it, and the concrete bases and manholes became an obstacle to its flow, and when the rains fall and the valley is a danger to the population, leakage of sewage leads to its mixing with the old neighborhood's water networks, which causes great harm to the population as bacteria multiply in the used water, which increases diseases and epidemics.



Figure 6 From the swamps of the Suwayfilah area, Hail, February 23, 2020

Literature review

Theoretical framework Introduction:

Safe and readily available water is of public health importance, whether it is used for drinking, food preparation or recreational purposes.

Improving water supply and sanitation, and better management of water resources:

1) Access to water

The Millennium Development Goals (Millennium Development Goal 7) for drinking water was achieved globally in 2010. The goal was to halve the proportion of the world's population with no access to safe drinking water.

2) Water and Health

Contaminated water and poor sanitation are linked to the transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid and polio. The absence, inadequate or poor management of water and sanitation services increases the risk of infection and disease.

Previous studies:

After extensive research regarding this topic, specifically on the water of Al-Suwifleh, the researchers found that previous studies have concluded that the problem started in 1425 AH and a sample of water was sent and analyzed in Riyadh at

King Faisal Specialist Hospital for Research
Rehabilitation of the valley (the Al- Adera
rehabilitation project) The Environment, Water and
Agriculture represented by the General
Administration of Water Services in Hail, advanced
steps from implementing urgent solutions to address
the problem of Wadi Al-Adera, where work is still
ongoing to withdraw standing water, cut grass and
construct water channels to transport surface water in
Wadi Al-Adera out of the urban area.

We got this information from a specialist in this field
Nayef Al-Rashidi, director of torrential management
in Hail, and contacted the office supervising this
project.

The process of collecting and analyzing data required
a lot of effort to extract the results and previous
research information needed to solve this problem.



Fig7, Suwayfilah, Hail, 2020 February 25

After studies and research in the region it was found that there is a possibility that the cause of the water is not fit, as the residents suggested that the wastewater that comes and crosses its way to the valley is the reason, and that it was in the past suitable for use and is one of the best water in the region of Hail, and the evidence that it is The effects of the many farms around it and the remains of palm trees and shrubs were valid in one day. This problem may be more engineering than environmental mainly, but it has caused damage to the semi-permanent environment, as it requires a high effort in amending the municipal errors.

We will make it clear that the contamination of Suwailleh water was caused by the entry of part of the wastewater to stagnant water and

materials and methods

The observations were accurately recorded by analyzing the water in the laboratory for food water in the region of Hail and we found that PH of water 7,7 and TSS 15 mg\l and TDS 2700 ppm and COD 28 mg\l we took accurate and clear pictures through the camera of the swamps, and information about the weather was obtained on the last date of precipitation and we found that the size of the swamp increased with precipitation

We recorded two observations during a five-day periods from February 20 to February 25 and carefully looked after the changes in the swamps concerned and the recent rainfall patterns, and we noticed that unpleasant odors were emitted after the rains and bacteria and microscopic organisms causing damage to other organisms.

Many residents of Al-Suwifleh neighborhood were affected by stagnant polluted water and wastewater, and rain water mixed with wastewater that formed swamps carrying many harmful bacteria causing disease.

We have noticed that stagnant water is polluted and causes harm to the residents of the area and helps to multiply insects that transmit disease. Residents have incurred material losses due to the high water levels and their raiding of their homes and the destruction of

home furniture and electrical appliances in addition to many other losses. With the increase of rain and the flow of torrents, roads were washed away and the concrete layer was removed.



Figure 8 A picture of a street in Suwayfila, in Hail, 2015, March 5

After a careful study of the water of the Suwailleh region, two possible explanations emerged: The first possibility is that the water of the area is affected by epidemics, which are harmful water that affects living organisms.

The second possibility is that the water in the Suwailleh area contains leaks from a fracture in one of the sewage pipes.

As we do not have devices for measuring HP water and analyzing it to make sure the presence of kidney coliform bacteria and other organisms that are harmful to plants and humans, we have used the Water and Food Analysis Center in Hail, and we have

contacted scientists to obtain data that shows the contamination of water in the Suwifleh region, and I have offered them the answer to some Questions in the questionnaire. Also, some of the interviews were prepared for the residents of the Suwayfilah region, to ensure the validity of some information and rumors that concerned with sewage leaks and their impact on the arable water. We were greatly concerned with how harmful this water is to people and plants, and how it affects plants. Surveys were supported for residents of the region by opening a link to online surveys:

<https://docs.google.com/forms/d/1LubpgzZ5GZIa9OHYfcuOmuXjZu-iamf0VT-R-VI0mrU/edit#responses>



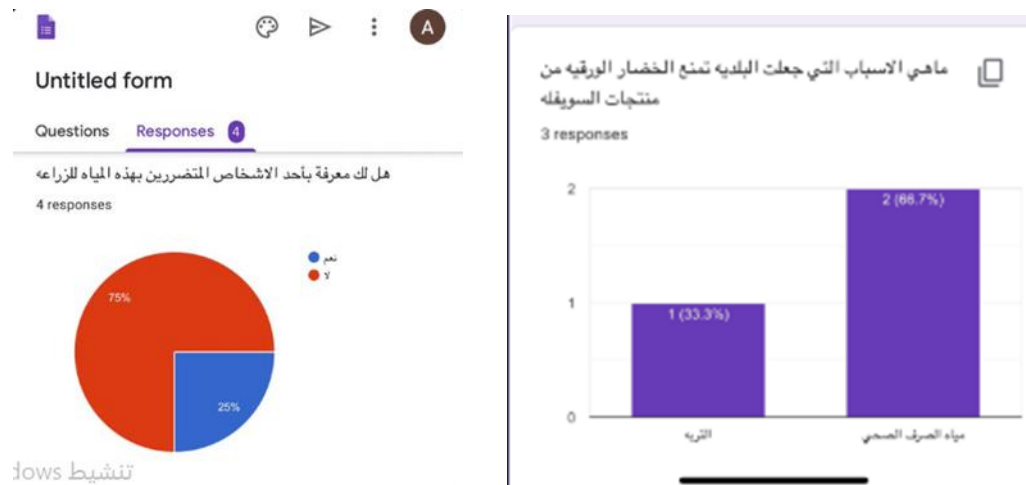


Figure 9. One of the survey statistics

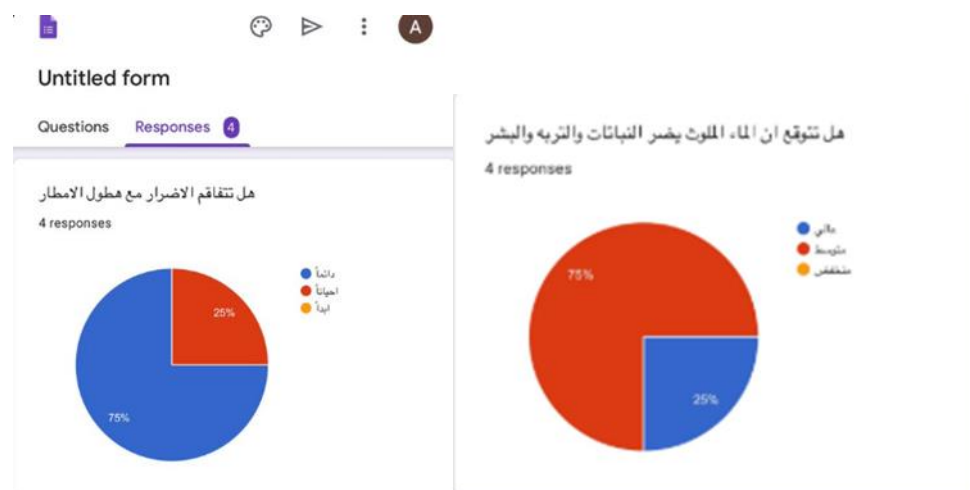


Figure 10. One of the survey statistics 2

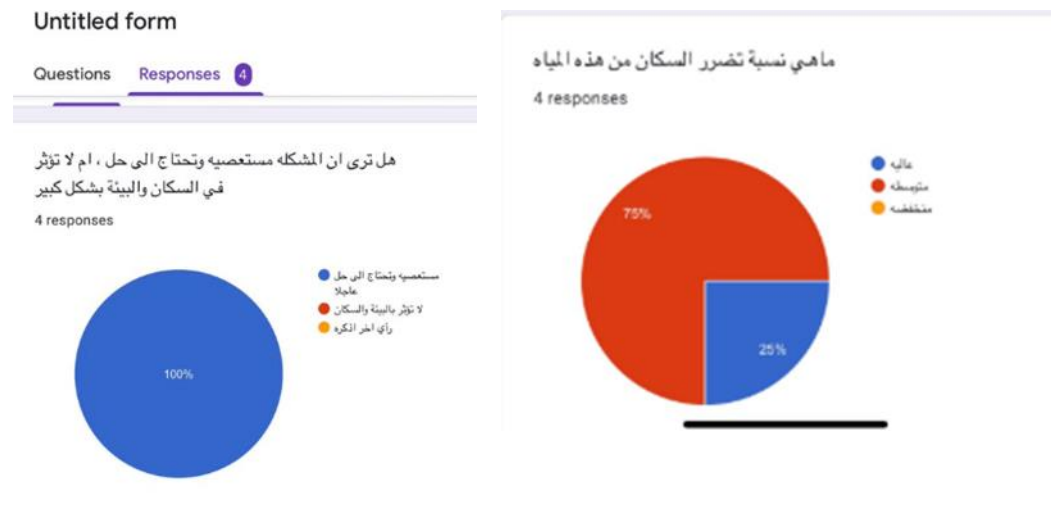


Figure 11. One of the statistics for Questionnaire 3

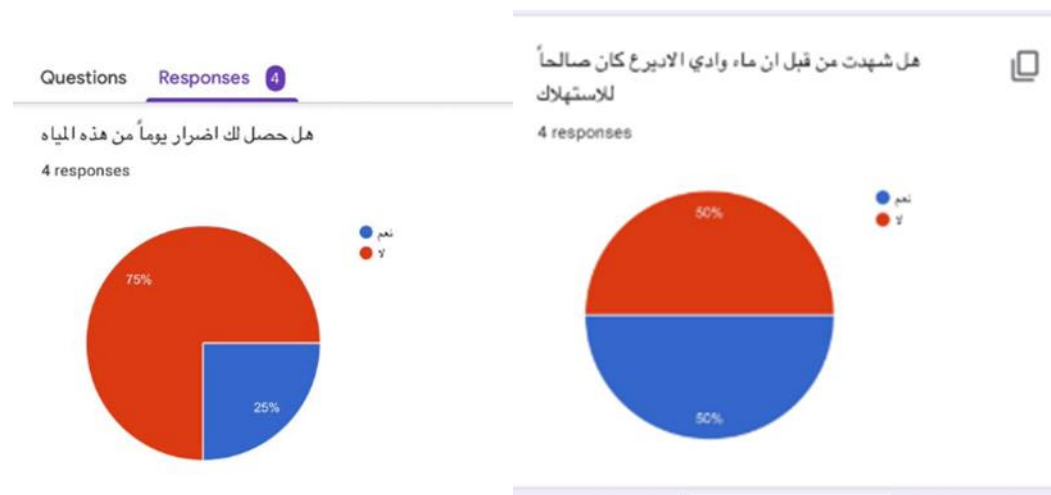


Figure 12. One of the statistics for Questionnaire 4


 وزارة التعليم
 Ministry of Education

استبيان عن احد سكان منطقه السويقله

السلام عليكم ورحمه الله وبركاته.

اما بعد:

تم اعداد هذا الاستبيان من اجل معرفة بعض المعلومات من احد سكان منطقه السويقله و الرجاء من السيد/السيدة المحترم/ة الاجابة عن الاساله التاليه:

☐ هل ترى ان المشكله مستعصيه ☐ وتحتاج الى حل ام لاتؤثر بالسكان والبيئه بشكل كبير؟	☐ مستعصيه وتحتاج الى حل عاجل ☐ لاتؤثر بالبيئه والسكان ☐ رأي اخر اذكره
ماهي نسيبه تضرر السكان من هذه المياه ؟	☐ عاليه ☒ متوسطه ☐ منخفضه
هل حصل لك اضرار في يوم من هذه المياه ؟	☐ نعم ☒ لا
هل شهدت من قبل ان ماء وادي الاديرع كان صالحاً للاستهلاك؟	☒ نعم ☐ لا ☐ جواب اخر
هل لك معرفه باحد الاشخاص المتضررين في هذه المياه للزراعه؟	☐ نعم ☒ لا
ماهي الاسباب التي جعلت البلديه تمنع الخضار الورقيه من منتوجات السويقله ممنوعه؟	نعمه لتركها في بيئتها من الملوثات فيها
هل تتفاقم الاضرار مع هطول الامطار؟	☒ نعم ☐ لا
هل تتوقع ان الماء الملوث بالبكتيريا يضر النباتات والتربه والبشر؟	☒ دائماً ☐ احياناً ☐ ابداً

الملاحظات:

صفحة بنت عبدالمطلب

Figure 13 is a questionnaire for a resident of the area.

استبيان عن احد سكان منطقة السويقله

السلام عليكم ورحمة الله وبركاته.

اما بعد:

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هل ترى ان المشكله مستعصيه وتحتاج الى حل ام لاتؤثر بالسكان والبيئه بشكل كبير؟	☒ مستعصيه وتحتاج الى حل عاجل ☐ لاتؤثر بالبيئه والسكان ☐ رأي اخر اذكره
ماهي نسبته تضرر السكان من هذه المياه ؟	☐ عاليه ☒ متوسطه ☐ منخفضه
هل حصل لك اضرار في يوم من هذه المياه ؟	☐ نعم ☒ لا
هل شهدت من قبل ان ماء وادي الاديرع كان صالحاً للاستهلاك؟	☐ نعم ☒ لا ☐ جواب اخر
هل لك معرفه باحد الاشخاص المتضررين في هذه المياه للزراعه؟	☐ نعم ☒ لا
ماهي الاسباب التي جعلت البلديه تمنع الخضار الورقيه من منتجات السويقله ممنوعه؟	☒ سبب تلوث المياه بالمرور لسيارات ☐ سبب تلوث المياه بالمرور لسيارات
هل تتفاقم الازرار مع هطول الامطار؟	☒ نعم ☐ لا
هل تتوقع ان الماء الملوث بالبكتيريا يضر النباتات والتربه والبشر؟	☒ دائماً ☐ احياناً ☐ ابداً

الملاحظات: لا توجبه.....
سفيرة بنت عبدالمطلب

Figure 13 is a questionnaire (2) for a resident of the area.

استبيان عن احد سكان منطقة السويقله

السلام عليكم ورحمة الله وبركاته.

اما بعد:

تم اعداد هذا الاستبيان من اجل معرفة بعض المعلومات من احد سكان منطقة السويقله و الرجاء من السيد/السيدة المحترم/ة الاجابة عن الاساله التاليه:

هل ترى ان المشكله مستعصيه وتحتاج الى حل ام لاتؤثر بالسكان والبيئه بشكل كبير؟	☒ مستعصيه وتحتاج الى حل عاجل ☐ لاتؤثر بالبيئه والسكان ☐ رأي اخر اذكره
ماهي نسبه تضرر السكان من هذه المياه؟	☐ عاليه ☒ متوسطه ☐ منخفضه
هل حصل لك اضرار في يوم من هذه المياه؟	☒ نعم ☐ لا
هل شهدت من قبل ان ماء وادي الاديرع كان صالحا للاستهلاك؟	☐ نعم ☒ لا ☐ جواب اخر
هل لك معرفه باحد الاشخاص المتضررين في هذه المياه للزراعه؟	☒ نعم ☐ لا
ماهي الاسباب التي جعلت البلديه تمنع الخضار الورقيه من منتوجات السويقله ممنوعه؟	☒ ... ☐ ... ☐ ...
هل تتفاقم الاضرار مع هطول الامطار؟	☒ نعم ☐ لا
هل تتوقع ان الماء الملوث بالبكتيريا يضر النباتات والتربه والبشر؟	☒ دائما ☐ احيانا ☐ ابدا ☐ ...

الملاحظات:
صفحة بنت عبدالمطلب

Figure13 is a questionnaire (3) for a resident of the area.



Figure 14, an image showing the penetration of this water into the Suwailleh region, Hail, February 25, 2020

Summary and Data Analysis

1) The percentage of yes answering a question (Do you think that the problem is difficult and needs to be solved or does it not affect the population and the environment significantly?) It is very large as it represents 75% of the questionnaire questions and it fulfills the assumptions.

2) Polluted water abounds in some places of Wadi Al-Adera.

3)The problem of the water in the Suwailleh region is not only new, it first appeared 16years ago, that is the year 1425 AH.

population affected by the water in the Al-Suwifleh area

4) A large percentage of the population of the region believes that the reason this water is not suitable for cultivation is its contamination with wastewater that contains E. coli, colic bacteria and some pathogenic bacteria in addition to fungal species.

Conclusions

Sample Analysis Report

<u>Parameters</u>		<u>Unit</u>	<u>Result</u>
PH	الرقم الهيدروجيني		7.77
TSS	المواد الصلبة العالقة	mg/l	15
TDS	الاملاح الكلية الذائبة	ppm	2700
Conductivity	التوصيلية الكهربائية	$\mu\text{S /cm}$	4480
TURBIDITY	العكارة	NTU	8.9
NO3	النترات	mg/l	23.3
NH3-N	الأمونيا	mg/l	0.31
(PO4)-3	الفوسفات	mg/l	0.5
NO2	النتريت	mg/l	0.04
Tempreture	درجة الحرارة	$^{\circ}\text{C}$	18.4
COD	الاكسجين الكيميائي	mg/l	28
P	الفوسفور	mg/l	0.2
P2O5	خامس اكسيد الفوسفور	mg/l	0.3

Figure15 After the tests are released

Recommendations

1) Increase research on the water environment in the Suwailah area and communicate with the General Directorate of Water and Agriculture in order to develop development plans to stop the water problem in Suwailah.

2) Carry out more analysis and tests necessary to know more how to deal with the water problem.

3) If there is sewage water leaking into the valley - water, then it must be repaired by setting a plan to repair the broken pipes

4) Pump out stagnant water, cut weeds (Al Qasba - plant) and construct water channels to transport surface water in Wadi Al-Ideera to outside the urban area.

5) Implementing three collection points and withdrawing water that was drilled in (3) sites and pumped into drainage fountains and building water channels in a stream the valley to facilitate the transfer and movement of surface water where a 9 km long canal was implemented along the valley

The urgent solutions work being implemented in Wadi Al-Ideera is concentrated in the most affected sites in terms of grass density and water abundance, as it is at the lowest point in the valley, which .descends to the north

Where the focus in this initial stage is from the intersection of the valley with the bridge of the ring

road in the kingdom's neighborhood to the intersection of the railroad track and the Al-Jouf highway with the valley passing through the Suwayfilah neighborhood (with a length of 15 km) to contribute gradually to reducing the level of surface water appearing in the south of the valley

On the other hand, opening the ferries in Al-Suwifleh and cleaning them by removing clay, silt, plankton and weeds that completely closed the ferries and which prevented the flow of water. Opening and cleaning of approximately (11) terms in more than one site in the valley.

Recommendations for the next research

Work should be done to complete the rehabilitation of the Valley by the Ministry of Environment and Agriculture and work for a sophisticated technical study and treatment of conditions and construction of dams for water, drainage of sewage, and take the necessary decision to solve the problem.



Fig. 14, Al-Adreea Valley passing through Al-Suwifleh region, Hail, in February 27, 2020

Sources and references

- 1- The journalist, Bashir Al-Zwimel, was contacted from Al-Iqtisadiyah newspaper



Figure 16 from the conversation with the journalist

- 2-The water analysis laboratory was contacted and some samples were sent to them.
- 3- We contacted the General Directorate of Water and Agriculture to find out reliable information.
- 4- The old research was completed and obtained by A. Nayef Al-Rashidi.

Communication with laboratories	Communication with those affected	Communication with schools	Communication with STEAM
Hail Water Analysis Center	Residents of the neighborhood: Majda Al-Damadi, Rakan Al-Abdeh, Abdul Rahman Abdullah Al-Damadi, behind Abdul Mohsen Al-Shammari	Al Naisia Intermediate School	Mr. Nayef Al-Rashidi The journalist Bashir Al-Zwimel