

The Geological simulation of water Shortage from Jifara Plain Basin of North-western

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Abstract

Libya is among the countries suffering surface water supply shortage Due to scarcity of rain and snow era, and the formation mature, the vast Libyan lands (1.700.000km) of which 95% arid lands, in this study our focus will mainly be on Jifara blain basin with such a complicated geological formation higher to the south and lower to the north with extreme slop towards the sea, this area was exposed to cleave movement resulted in two fractures, the first fractures heading north-east toward Tunisia borders as for as Jabal Abu-kirsh , 100 to 200 meters , the second fracture is heading west and called , the greater Azizia elevate , such movement led to fold and slop towards the sea forming three rock units :

- 1- Mountain front sequence extending from homes to missiles to the west where it includes gargarish formation constituting sand lime sediments, such sediments formed water reservoirs of great subterranean water reserves.
- 2- Mountain front sequence extending east and west to Tunisian borders, this line of sequence includes Abu-Gailan and Abu-Shaiba being covered by sand and limestone soil sedimentary containing underneath lime sediments it is around 700 meters over sea level, this formation also contains deep and wide gulfs including Mjineen and Essirt valleys being the main feeder to most north west area.
- 3- Hadba surface sequences include the 4th era formations scattered in most edges and centre of the area with rock masses in which much low water exists. It is believed that such rock units moved back to its present place by reason of different erosion factors, the basin is believed to be covered by lime and sand rock

that led to the birth of lime water accumulations reaching 2.4×10^{10} cubic km. Also the occurrence of low level water reservoirs scattered in the centre of the basin which was exposed to up and down and fracture movement contributed to the lowering of the north part of the basin most parts of this basin have been flooded by sea water during the Miocene and Oligocene resulted in the formation of rock Hollows consisting large quantities of water most of which are accumulated in the sea it is also believed that there is a large water basin branching from Jifara plain, it is also believed that the low level in the underground reservoirs is attributed to the low level of the north part of the basin where water flows from the south part towards the lower north part to flow into the sea water forming fresh water reservoirs inside the sea if we examine the way taken by water during the water cycle we find the movement indicates that it originates from sea to land , then land to sea again , once again it is believed that most countries will produce fresh water from sea in future as a result of water cycle of water returning to its original source.

The 4th era sediments are considered to have contributed to the basin surface and underground features formation during Holocene containing water carrying sediments such as Quaser El-haj formation consisting of lime and grain rocks where reservoirs of Al-Azizia Abushaibs and Abu-ghailan are located where water is being pumped from Miocene layer as well as gargarish

Formation which contains Ber El-Ghanam and kikla reservoirs that are covered by lime sediments, water is being pumped towards south of the basin, the south area of the Jifara plain . there are also saline sediments being spread south and west of the basin such saline's were as result of dropping of Oligocene the matter which led to the salinity of the soil by effect of infiltration of salts contained in the rain water by this study we expect to find a trace of water flow from Jifara plain, towards sea, through a hollow in its north part, this matter resulted in creation of severe water shortage in the area.

In this study, it is proposed that 3D three dimension surveys be carries out in the basin to find out the geological structure which led to this natural phenomena resulting in deformation to the

installation of water distillation units for the purpose of refilling of such underground water reservoirs for the increase of its pressure and water reserve and increase of pressure.

Introduction

1. Through this study we hope to know places of fresh water Immigration of Its direction in the seawater and the exploration in of the flooded area Tripoli and Zwaarah this area has in the past been exposed to cleaving movement and Descending resulted in major fault systems of fractures that Contributed to the Immigration of huge Quantities of water to the Sea and vice versa salt water to Jifara Plain basin forming large of We also believe that system faults beds to the spread of large Quantities of water in the sea water in this form of water springs And Basins immigrated from Azizia and Abughelan water reservoir Through Azizia cleave and Other Small Rifts extending north east .

Two refract have been attributed to inclination and crack monument:

The first Refract It's in the direction of North West south east at distance of 100-200 m to knish mountain .**The second** Refract It's from El Azizia in the east to About Ghilan in the east.

As a result of this movement, AI Jifara plain is inclined towards the sea and huge amounts of water gathering formed in basin extended from khoum is to Zuwarah.

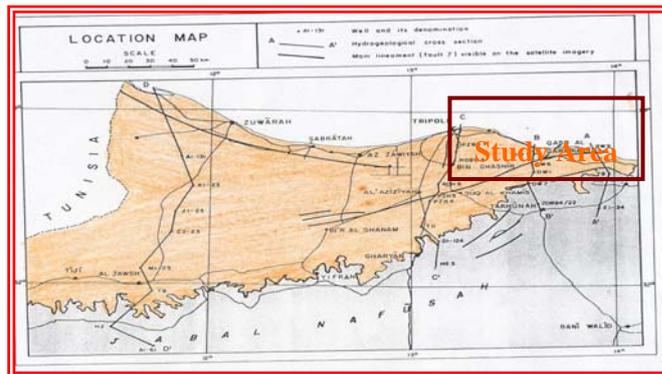
It's believed that ground water flowing through those cracks towards the sea may form water springs.

At the beginning of fourth era, sediments and alluvium have been formed in the area from north east to southwest during the raining era. The inclination is rated 2 –4 richer scales

LOCATION GEOGRAPHY

The Study Area is situated in the western area of Jamahiriya. On area of 13500 km, being bordered by Mediterranean sea from the

northern and hit etude 32, 00 to the south and between 12, 00 – 13,300 to the Mediterranean Sea .

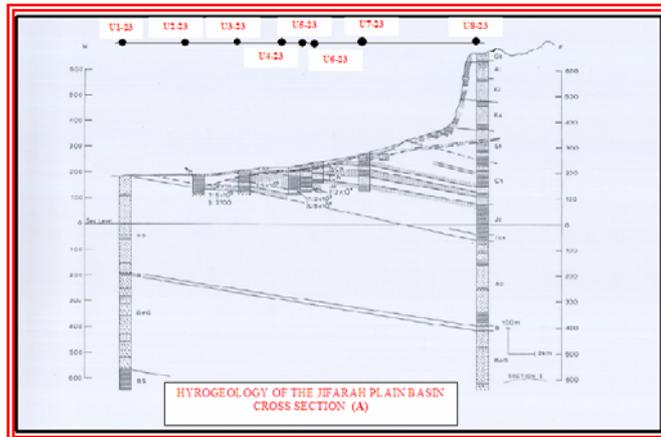


Location geography Jifara plain

1 OBJECTIVE STUDY

This study aims at finding out of areas of fresh water immigration through cleaves towards the sea and Interpenetration areas threatening agricultural areas by thought and collapse.

- The study also aims at locating areas of fresh water among salt water which can be utilized in filling groundwater reservoir to increase its pressure.
- * finding out the Geological position of the area for construction of seismic observation posts along the coast line.
- * finding out the environmental position of sea bed for study of pollution problems.



DESCRIPTIVE STUDY SEDIMENTATION

Study of surface Geology (geomorphology and topography), And its sediments is very important in different areas because it is provides clues about subsurface geology and structural geology that give good indication about Mineral mines (coal, iron, gold, Diamond, phosphates and radioactive elements).

We also believe that system faults beds to the spread of large Quantities of water in the sea water in this form of water springs And Basins immigrated from Azizia and Abughelan water reservoir Through Azizia cleave and other small Rifts extending north East And South-West in the area of study this area has also been .

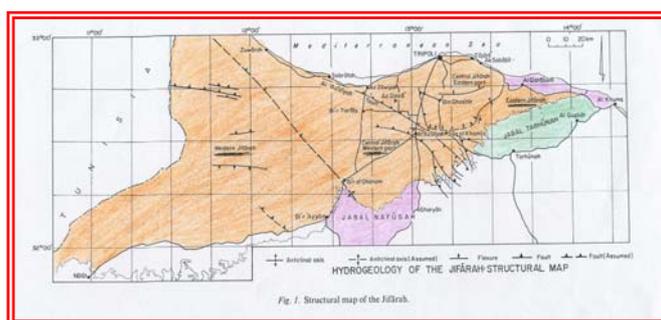


Fig. 1. Structural map of the Jifarah.

Structure Geological & Ssimulation **Jifara plai**

2 GROUND WATER SOURCES IN THE AREA

The area is covered by rocks containing mender ground water reservoir containing fresh water namely:

1- The north part of Jifara plain pumping water from reservoirs in the Holocene age and Miocene where water is found in sandstone and limestone which contains mud non porosity lagers.

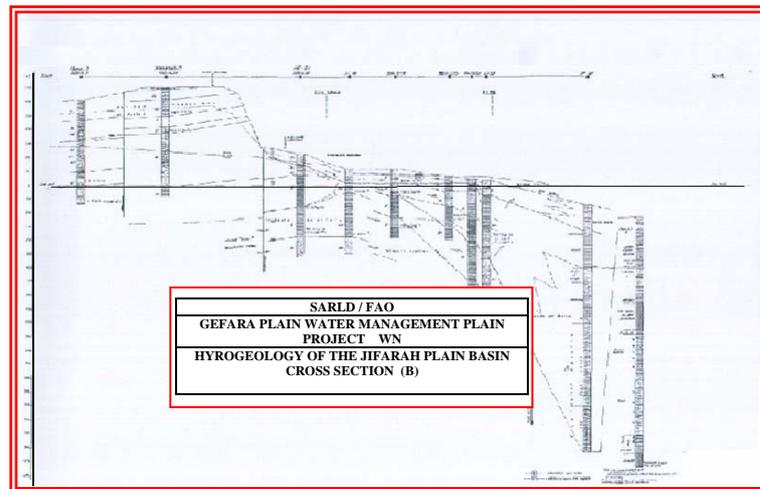
2- The southern port pumps water from Abu-kersh formations, Azizia and Abushaiba, where depth water wells

Is not less those 70 meters at Bier El-Ghanam area and 325 meter at Azizia area.

3- The western part in this area is being pumped from kikla formation where depth of well is not less than 200 meters.

Number of water springs such as been El-Haj water springs in Gharion area, and aim tuba water spring.

These resources are the main feeders to the area and most water have immigrated towards the sea through cleaves and faults forming water springs in side the sea which can be utilized



STRATIGRAPHY

@Through Azizia cleave and other small Rifts extending north -East And South-West in the area of study, this area has also been Exposed to water valley sediments during Rating Seasons.

@ System Faulty of Paleozoic and Mesozoic Rocks that occur in the surrounding It consists of three rocky unit:

1- Al-Jifara plain :

- It stretches from mountain is adjacent to the sea to Tunisian borders. Its about 150 km wide. The plain costal line is covered by sediments of the fourth era carrying water including Gargarsh and Jifarah formation where AI Jifarah plain is located which includes Azizia and abou Sheiba reservoirs.

As for the middle part of the plain is covered by AI Jifara formation sediments sand hills 100m above sea level. The southern part is covered by foot of Nafousa Mountain from which water flows towards the reservoirs and AI Jifara plain during rainfall season.

2- front of hill or mountain :

Its stretches from al khoumis in the east to the Tunisian borders in the west and it known as Nafousa Mountain and consists of lime-silicate rocks mud and plaster, it's about 400-700 m high above sea level.

The front of a mountain is formed in high prominences by Elmjaneen and elusory valleys.

Its believed that the southern part of this mountain has been moved to its present place due to denudation where as the northern part has been formed as are salt of sea denudation and moved to its place due to sequential denudation

SEDIMENTS OF THE FOURTH ERA CARRING WATER IN THE AREA .

The most important sediments in the area since they are the base of water basins and layers carrying water. These sediments are divided into rocky units as follows :_

1- Qasr El-haj formation;

it consists of differently consists tent pebbles along with caliche layers as well as it includes Qasr El-Haj water spring AI Jifara .

2- AI Jifara formation ;

It covers AI Jifara plain and consists of sand SEDIMENTS, silt and caliches rocks as well as it includes reservoir in Azizia Abou sheiba and abou ghilan .

3- karkarsh formation :

it forms littoral foots and consists of kainite used for gravel .

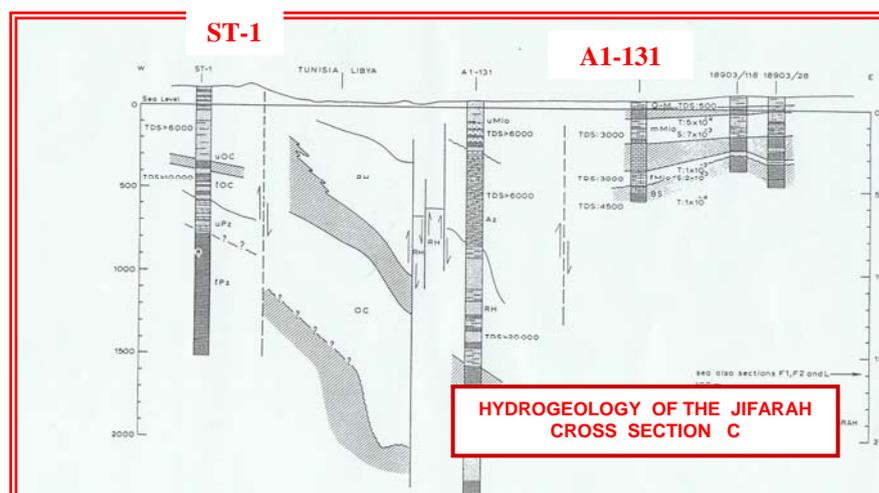
4- moor sediments :

the locate in the coastal zone between Sabrata and Zuwarah . It consists of calciferous crust with sand and silt .

5- windy and water sediments they cover low parts of hill foot and consist of silt and soft sand

6- Sediments of sand dunes the cover the mid part of AI Jifara plain and sometimes cover the beach the consists.

7- Sediments of recent valleys they consist of pebbles, silt and soft sand.



FORMS OF AQUIFERS IN THE AREA :

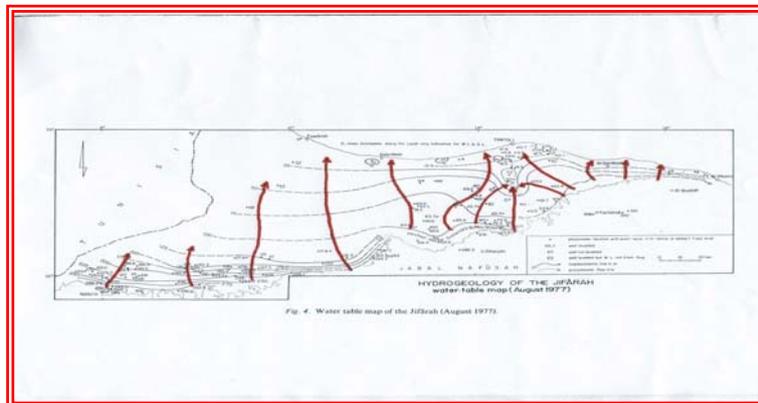
1- Non -confined aquifers

they are large mounts of water under earths surface and subsurface as well as equalize the atmospheric pressure and opened on the atmosphere .

2- confined Aquifers :

water flows out vertically to semi-confined Aquifer and they are fed by rainfalls.

This sort of Aquifers locates in the middle area in Jamahiriya

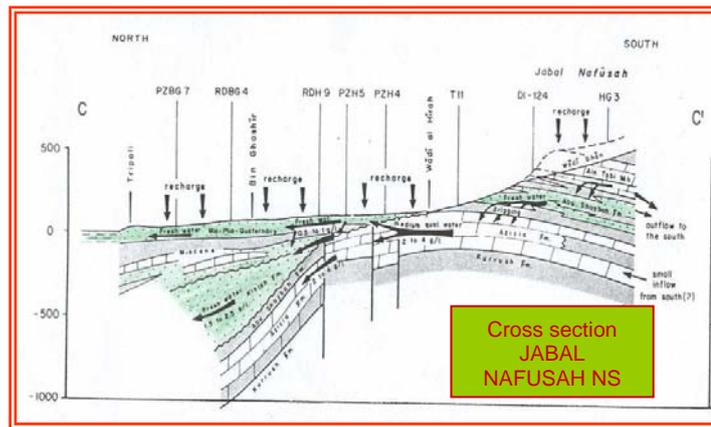


Flower water to north Jifare Basin

PROBLEMS OF PUMPING GROUNDWATER IN THE AREA:

The pumping of ground water may cause to form crocks with sharps edge and refracts in earths surface . these crocks consist of refracts parallel generally with contour lines and they may block surface water ranging towards arable lands in AI Jifara plain.

Inundation running water is to deepen the cracks and lead to join them together. Consequently the distance for these cracks increase as well as differential subsidence due to non identical sedimentation in AI Jifara plain which leads water flow to the sea.



Simulation Reservoir Jifare plain Basin

CONCLUSION

Finding out places of salt water immigration towards the land, and To Implement all ways and methods possible to slop this Immigration through filling the wide spread deep water reservoirs In the area for the creation of pressure partier to prevent sea water From infiltration to land, by pushing it back towards the sea.

It is suggested that scientific study for the exploration of the Libyan territorial waters through short term aerial surveying Electric sound of infra Red, this would enable us to know the Structural Geological situation along the North coast of Great Jamahiriya.

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