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Study the economic importance of salted reeds and the factors affecting it geographically

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Abstract:

The importance of studying Qasab Salt Flats as an internal sabkha is since it represents a unique model in the Al-Washem region in the Kingdom of Saudi Arabia. It is also characterized by distinctive morphological features surrounded by some of an aerial origin, others of a flood origin, and the third group of rocky appearance. All these factors have combined with the climate in forming this geomorphological phenomenon, This is what we observe in the sabkha al-qasb, one of the internal composts in the Kingdom of Saudi Arabia's arid environment.

The salinity of the al-qasb is located in the Al-Washem area, west of Tuwaiq mountain, and has an area of 33.6 km2. The climate, geology, topography, and the internal drainage system are the main factors that led to its formation.

The study area includes four terrain units: the first is the salted ground itself, the second is flood features, floods, and squares, the third is dunes and sand beds, and the fourth is the leveling surfaces covered with saline soil of little thickness.

Saline weathering is one of the most critical dangers to which buildings, facilities, and roads are exposed in the study area, and the salt crust above the sabkha is the essential source of the saline weathering process as the rate of evaporation increases on the rate of precipitation, especially in the summer, which increases the precipitation of salts, the thickness of the salt crust in the sabkha increases.

The field study clarified the current use of sabkha and the possibility of benefiting from the marsh environment through industrial development and making use of the mineral and chemical elements from sabkha deposits.

Key words*: Qasab Salt Flats, geography, economic importance, factors*

I. Introduction:

The phenomenon of marshes and salts is one of a dry environment's characteristics, which has received little attention in studies except to a relatively limited extent.

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Sabkha forms a distinct geomorphological aspect, and sabkha is defined as the land near the groundwater level or sea level. It is divided according to its location into coastal sabkha and internal sabkha, according to the shape and geographical location, and the sabkha is an Arabic term given to the salty land from which water infiltrates and sinks. Feet, and in the surrounding dictionary, "a land of salt and oozing." Sabkha is also known as salty land, and sabkha is where salt grows, and salt grows and feet dirty, Al-Sabkha Al-Nashsha is also referred to as the wet, salty land whose richness does not dry out, nor does its pasture grow.

[1](Al-Humaidhi, 1988) dealt with the internal sabkha as atomization pits whose axes run parallel to the prevailing winds, formed by the wind, approaching the groundwater level, and with the increase in the temperature and the rise of the water with the capillary characteristic, the rates of evaporation increase and the marshes are formed, as the continental groundwater plays a role in Configured.

Objectives:

This study focuses on the economic importance of reed marsh. The objectives of that study include:

To identify the factors of salinization in this position and reveal the role each factor played until it appeared in its current form.

Study the economic importance of the sabkha and the factors affecting it geographically.

Studying the dangers to which the sabkha is exposed as a result of human intervention, to find appropriate solutions to it, and determine the potential for future development and optimal use of marshlands.

II. Methodology

The study relied on several quantitative analysis methods and using it in processing quantitative data, then analyzing it with statistical methods.

Objective Approach: It is based on the study of sabkha as a geographical phenomenon in terms of the factors that led to its emergence and its phenomena.

Analytical Approach: It was used by dealing with the geology of the sabkha, recording field observations, and analyzing some morphometric measurements of the subtle phenomena on the sabkha's surface.

The historical approach: It was used to identify the developments and changes that occurred in the sabkha and the extent of the human factor's interference in the occurrence of these changes, through data, maps, and satellite visuals for various dates (1986-2002-2018), in addition to the amount of economic production and its indicators of rising or fall Over the years.

Study hypotheses:

There is a statistically significant relationship between the dangers to the sabkha resulting from human intervention and the means to reduce sabkha risks in the Al-Qasb city.

Study population:

The study population consists of (30) families, including (100) individuals of different ages, who are Al Qasab City residents.

The study sample:

Due to the small sample size, the questionnaire was distributed to approximately (100) residents of the city of al-Qasab, of different ages, and those concerned with the marshlands.

Study tool:

In addition to using secondary information tools such as studies and research, the questionnaire was used as a study tool to collect information from the study vocabulary and apply it to the field side of the study.

III. Results and Discussions

3.1. GENESIS FACTORS OF THE QASAB SALT FLATS

3.1.1. Al-Qasb City:

The town of al-Qasab, in central Saudi Arabia, is one of the oldest settlements in the Arabian Peninsula, and it has kept its current name for tens of centuries and has been famous throughout its history for its production of wheat and salt crops.

From ancient times to this day, they used to call it what could be called a "food basket" through the production of its land (brown wheat) and table salt (white gold), and the topography of the city, Moreover, the efforts made by the government and private agencies in the city to develop it have made it eligible to become a tourist attraction for its residents and visitors from all parts of Saudi Arabia and outside. **[2]**

It is located northwest of the city of Riyadh (160 km) between longitudes 25.17.25 north and 45.30.17 east, east of the Tuwaiq side and west of the Nofood Al-Ariq and the north of it Rawdat Al-Akarsha, at an altitude of 671 meters above sea level, and it belongs to Shaqra Governorate administratively.

Al-Qasab is an ancient town since the pre-Islamic era, mentioned by Yaqut al-Hammoudi and others, and it is several reeds, including the Qasbah al-Tarfa, the Qasbah of salt, the Qasbah of al-Ramada, the Qasbah of the Oud, the Qasaba of al-Ruqibiyya, the Qasaba of Burj al-Huwaish, the Qasaba of the Shu'bah, and other scattered reeds.

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Moreover, the reeds and the reeds are a collection of a reed, which confirms that there were several residential communities, each of which was called a kasbah and a qasbah, each of which was inhabited by one or more tribes, among them the ash-ash, and among them (al-Qasiba) that was near the ash-ashramah, and including the town of al-

Oud, which is located north of Sabkha al-Malah and south of The current plan of the reeds, which has ceased to exist, including the Qasbah al-Tarqa, the Qasaba of the Salt, the Qasbah al-Ruqaybiyya, and the Qasaba of Burj al-Huwaish. **[3]**

The city of reeds (Al-Qasab) has been famous since ancient times and to this day for the production of edible salt through the salts in the suburban lands near the town, which exceeded twenty salted ones, as it produces one-third of the Saudi market needs of edible salt that is extracted from these salts**. [4]**

Since its discovery, salt has been the main product in reeds since ancient times, and it supplies cities and villages across the country with the needs of the population from this product, and it is even exported to Yemen and the Arab Gulf states.

And it was transported previously on the back of camels, then on cars. The "Zad" salt refining factory was established in the reed with the highest specifications and the latest technology for the production and packaging of table salt in different sizes and with high quality

In the past, salt was extracted in arduous and costly ways, and after the availability of mechanisms and pumps, the cost decreased and the number of manpower decreased, and the method used now to refine salt is easily achieved. **[5]**

The Qasab Salt Flats is a "sabkha" fed by almost all "Hamada" valleys, as it heads from all directions to settle with its loads of silt, sand, and salts, forming a middle ground of low agricultural and vegetation, where no plants live, and no trees grow except for the " Tamarix " shrubs, and some shrubs that She was paralyzed in her growth due to the presence of highly concentrated salts that significantly impeded her,

As for the weeds, they do not exist at all, as the land is completely flat in the marshland, and this flatness is a natural result. The sediments formed the surface, and the water made it level, and these marshy lands were surrounded by less salty land, and due to the quality of their soil, they became farms that harvested their crops of wheat, mostly when the rains were heavy, such as places of "Hujaira" and "Ayuj." Soil with increased salinity. **[6]**

3.1.2. Factors of the genesis of salted in this mode:

The sabkhas usually form in the lowlands, which are usually a collector of torrential waters that carry large quantities of salts with them as a result of their dissolution during their passage over many types of soil types.

Qasab Salt Flats is located in the west of Tuwaiq Mountain and to the southeast of the modern city of Al-Qasab, about five kilometers east of the road leading to the city Thurmada. It has 50 square kilometers, a length of 11 km, a 4 km breadth, and a depth of 5 km. Several main factors helped the Qasab Salt Flats formation in this situation, and they are:

1. The climate.

2. Geology.

3. Topography.

4. The internal drainage system.

The Salt Flats "al-Jafara" is said to have been in the past a lake of water, and its waters dried up. Because of the lack of rain, and its land became muddy: because water comes to it from all sides and does not come out of it, and when it dries up it is marshy, and they found salt in it, and they sweep from the top after it dries up, then they dug in it about a meter, and the water came out, and it evaporated from the heat of the sun and froze, And it became salt, and they extracted a lot for it, and the land became muddy: because it is lower than others, so water collects in it and does not come out of it.

The salting reed extends between latitudes 14 45 ° and 45 17 25 ° north, and between longitudes 20 32 45 ° and 39 45 ° east, and thus it is located in the heart of the Arabian Peninsula in the arid zone in which the rainfall is less than 25 mm. Generally, with a height of 650 meters above sea level, it is the lowest part of the basin region, surrounded by the edges of Mount Twaiq from the north, east, and southeast and ancient countries from the west and southwest. **[7]**

The water discharges from the edge of Twaiq Mountain and the Ariq Al-Baldan of the highest, flowing towards salinity through clear valleys or low parts between the Ariq Al-Baldan dunes.

It has been mentioned in the heritage books that the valleys of Ragam - meaning the sand located east of Al-Tashm and called Ariq Al-Baladn - lead their waters to ash, which is marsh near the reed, which has now become the reed**.** **[8]**

This indicates the Ariq Al-Baladn role, with its various dunes, in supplying Qasab Salt Flats with water since ancient times. The breadth of the two countries reaches 6.9 km and approaches the southwestern tip of the saline so that the distance between them does not exceed 1-2 km. The height and porosity of its sandy sediments play a role in the drainage of the water towards the saline, provide it with part of the water, and the gradient's average gradient between Ariq Al-Baladn and Qasab Salt Flats is 3.5 degrees.

3.2. The economic importance of the sabkha and the factors affecting it geographically.

3.2.1. The economic importance of the sabkha:

Qasab Salt Flats is one of the essential salts in Saudi Arabia and the Arabian Gulf due to its fame, the abundance of production and quality, and it was and still is the primary source for feeding the markets with salt in the region, The stages of salt production and marketing have gone through several stages and developments with the advancement of production machinery and technology.

The Qasab Salt Flats is a type of coarse raw salt known as sodium chloride. It varies in shapes and colors, ranging from light blue shades to red and orange shades, and this type of salt is considered the purest form of salt according to several American studies because it is free from environmental pollutants and chemicals that are added to other types of salt such as fine table salt.

3.2.2. Production:

Salt production requires time, effort, and constant follow-up, as it used to be a matter in the past to choose the appropriate land first so that it becomes a marsh, then put earthen barriers to prevent torrents from storming them. A circular hole is made like a well in order for the water to come out a few meters away due to the proximity of the water. The well's depth was not more than 3 meters, but due to the frequent water drainage, it is now 9 meters deep.

After drilling the circular surface well, ponds of different sizes are placed, 15 m wide and 30 m long, and others with larger sizes reaching 30 m by 60 m.The “surface well” and the “ponds” are supplied with salt water, as the “ponds” are filled with water from the “well” and left to dry out due to the heat of the sun. After that, workers begin to extract pure white salt from those ponds, and it may sometimes have dusty impurities in which the workers are forced to wash it With saltwater until it is white.

3.2.3. Estimated production quantities:

It was mentioned in the book of Al-Qasab by Nasser Al-Humaidhi from the series (This Country): “The amount of salt transported from the marsh of the reeds during one year amounted to (44880) forty-four thousand eight hundred and eighty tons, which is equivalent to 8,976,000 bags of 5 kg capacity (eight million nine hundred and seventy-six thousand), Looking at the price of this quantity, we find that it is sold on the site at a meager price, sometimes reaching one riyal as a value for a 5 kg bag, but when it is distributed, the price doubles to two riyals, (These prices and quantities were prepared and collected upon printing the previous book years ago, and it is striking that the quantities produced are enormous and the return is suitable for large quantities). **[9]**

Decades ago, the ancestors were suffering from the marketing of salt after extracting it from the "ponds," as the process of marketing it was by carrying it in bags of cloth or leather and transporting it on the backs of camels to the markets - before the emergence of cars - and it was sold by weight.

After the cars' appearance, it was transported in the car sump - its rear trunk - in bulk, and then it was sold to the shopkeepers by weight, and the marketing process was laborious. Where the car owner waits days to market his salt.

The people continued in this primitive method of extracting salt for several centuries, and it was considered a hardship that exhausted the people, so they left it years ago due to their hardship, That was after the availability of expatriate workers, which formed low-paid laborers and could work hard without paying attention to life's concerns. Where they lived near Al-Malaleh, their preoccupation became the production of salt diligently and diligently.

3.2.4. Production level:

Qasab Salt Flats contains several types of salts Flats, which are called "Al-Jafara," and its ownership belongs to a number of citizens, as one citizen often owns a shallow well and some ponds,

One medium-sized pond yields about 100,000 kilos of salt; Where it is dried on its sides to be transported by medium-load cars, which transport about 4000 kilograms in one response, packed in plastic bags, the weight of the bag is about 3.5 kilograms, and there are more than 50 medium transport cars, in addition to large cars that transport

bags with the most packaging of up to 30 Kilos and 50 kilos are exported inside and outside the Kingdom, as they are exported to all regions of the Kingdom and the Gulf countries.

3.2.5. Primitive Marketing:

After the salt was extracted from the ponds, it was marketed by transporting it by camels before the appearance of cars in bags of cloth or leather, and then heading to the market and sold by weight. Then it was sold in the shops by weight, which was about a kilo per Riyal, and the issue of marketing it was not easy. The car owner waits for days to market his salt, and as a natural development, salt is now sold in plastic containers and bags of small sizes, and this method has increased the marketing of salt. **[10]**

3.2.6. Modern technique and price reduction:

After the emergence of modern technology and advanced heavy equipment, the hardship of workers in the production of salt decreased, and the amount of salt extraction increased in large and commercial quantities, which contributed to reducing the cost of production after reducing the large number of workers that were required to work, as the equipment now takes over digging ponds at great depths and broad areas. After the ponds dried up, the equipment became the one that produced the pure salt, and the task of the workers began to work on operating this modern equipment and in manual packing and loading into cars for marketing. This, in turn, reflected on the economic return and increased the quantity and abundance of production.

Perhaps production in large quantities has dramatically damaged the price, which made it drop continuously from three Riyals since four years ago to one or two Riyals, per bag weighing 3.5 kilos, so the salt pile reaches 20 thousand kilos, which can be filled in consecutive sessions of salt workers, and cars are transported first-hand. So that the car carries about 1500 bags or about 400 kilos.

Among the manifestations of the technical development that has occurred in the salt extraction process is the establishment of a citizen of a factory for the refining and production of salt. The factory undertakes the production of coarse salt in attractive new packages in addition to the production of fine salt in plastic containers of multiple sizes. The need was urgent to find such this factory, as it provided the fine salt packages needed by the local market and it was importing them from several countries despite the availability of salt in large commercial quantities that prepared them to feed the local market and the markets of many neighboring countries. **[11]**

3.2.7. Factors affecting sabkha geographically:

1. The sabkha is exposed to torrential torrents due to the slope of the Hamada valleys towards it, which leads to the formation of lakes that lead to the burial of salt and dirt with water, dirt, and silt, which causes significant losses to the producers and the lakes may last for several months, which increases the losses for the investors.

2. The amount of salt produced is inconsistent with what is consumed, which causes the producers to increase the stock and expose it to damage when the storage period is prolonged due to the sun’s heat and its effect on the plastic bags or the stock is exposed to rainwater and torrential torrents and sometimes its final damage.

3.2.7. Main production problems:

1. The lack of life essentials in salt production sites such as electricity, water, and telephone, despite its proximity to the Al-Qasb town.

The lack of asphalt roads connecting the sabkha to the Qasb town also the places of production need asphalted internal roads to facilitate transportation, especially during the rains, as the land is muddy and it is not easy to walk on it. This profession suffers from citizens' abandonment of work in salt production and the low selling price, which affects producers' income. **[12]**

3.3. Studying the dangers to which the sabkha is exposed due to human intervention and determining the potential for future development and optimal use of marshlands in the Qasb city.

A questionnaire on studying the dangers to the sabkha resulting from human intervention and determining the potential for future development and optimal use of marshlands in the Qasb city

3.3.1. Data source and data collection tools:

3.3.1.1. Study variables.

The study consists of an independent variable and dependent variable, which are as follows:

- The dependent variable: means of reducing the risks of sabkhat in the Qasb city.

- The independent variable: the dangers to which the sabkha is exposed due to human intervention.

3.3.1.2. The paragraphs of the questionnaire and its scale

The questionnaire consisted of three items, as follows:

The first paragraph includes demographic data for the study sample, such as (name, age, gender, educational level).

The second paragraph: determines the dangers to which the sabkha is exposed as a result of human intervention among the sample members.

The third paragraph: concerning means of reducing the dangers of sabkha.

3.3.1.3. Stability of the tool

The stability factor calculation using Cronbach's alpha was relied on to achieve consistency in the study results.

3.3.2. Statistical methods used in data analysis

To answer the central question of the study, we used the Statistical Packages for Social Sciences (SPSS) program to analyze the questionnaire data statistically, and the following statistical methods were used in order to answer the study's questions:

- Frequency distribution in order to identify the characteristics of the study variables and describe their trends.
- Correlation coefficient to find the relationship between the dangers to the sabkha resulting from human intervention and the optimal use of marshlands in the sample's Qasb city.

3.3.2.1. Data reliability test

Table No. (1) Shows the data stability test results for the study axes using Cronbach's alpha coefficient.

Axis	Cronbach alpha coefficient
Demographic features and basic characteristics of the sample	0.970
Dangers to sabkha resulting from human intervention	0.973
Means of reducing the dangers of sabkha	0.976

The previous table shows the high reliability of the data for all study axes, as the Cronbach alpha coefficient for all axes ranged between (0.970 - 0.976), which indicates the possibility of using different statistical methods to analyze the study axes.

3.3.2.2. Analysis of metadata and study results

This part is concerned with analyzing the metadata and the results of the study for all study axes using tables and graphs as follows:

3.3.2.2.1. The demographic features and the essential characteristics of the sample

Table No. (2) Shows the results of testing the percentages, arithmetic means, and standard deviations of the sample's demographic characteristics and essential characteristics.

Table (2): Results of testing percentages, arithmetic means, and standard deviations of the demographic characteristics and essential characteristics of the sample.

Axis	Axis items	Percentages	Arithmetic Mean	Standard Deviation
Type	**Male**	48%	1.52	0.50

	Female	52%		
Educational level	**Primary School**	%16	2.64	1.08
	middle School	%34		
	High school	%20		
	diploid	%30		

It is clear from the previous table and the following diagrams:

- 48% of the respondents are males, and 52% of the females, meaning that the study sample under study is concentrated in females. Figure (1)

- The majority of the sample members are registered in the preparatory stage by 34%, then holders of a diploma by 30%, followed by those enrolled in the secondary and primary stages at 20% and 16%, respectively. Figure No. (2)

Figure (1): the type of sample members

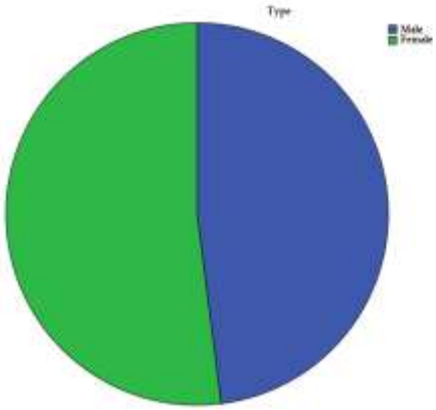
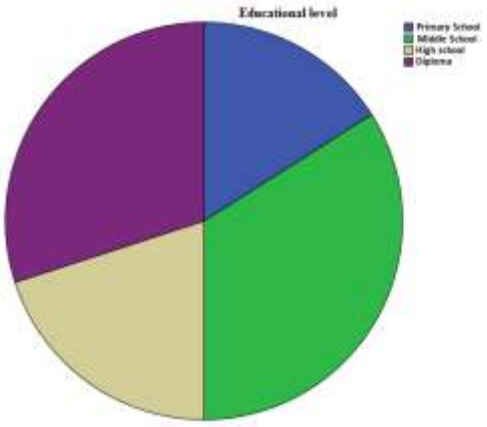


Figure (2): The educational level of the sample members



3.3.2.2.2. The dangers to which sabkha are exposed due to human intervention

Table No. (3) Shows the results of testing the percentages, arithmetic averages, and standard deviations of the dangers to which the sabkha is exposed due to human intervention.

Table (3): The percentages, the arithmetic mean, and the standard deviation of the risks to which sabkha are exposed due to human intervention

Axis	Axis items	Percentages	Arithmetic Mean	Standard Deviation
The sabkha soils sink as a result of human intervention	I totally agree	27%	2.21	1.12
	I agree	45%		
	Neutral	15%		
	I do not agree	6%		
	Never agree	7%		
The use of saline areas in the construction of	I totally agree	29%	2.26	1.19

buildings	I agree	40%		
	Neutral	15%		
	I do not agree	8%		
	Never agree	8%		
Negative impact on the environment and roads as a result of human intervention in the sabkha	I totally agree	30%	2.12	1.11
	I agree	47%		
	neutral	11%		
	I do not agree	5%		
	Never agree	7%		
Buildings cracked and foundations eroded due to soil instability	I totally agree	27%	2.24	1.15
	I agree	44%		
	neutral	14%		
	I do not agree	8%		
	Never agree	7%		
Not identifying buildings by determining saline areas	I totally agree	26%	2.24	1.13
	I agree	45%		
	neutral	15%		
	I do not agree	7%		
	Never agree	7%		

From the previous table and the following graphs, it is evident that all sample members agree to the dangers to which the sabkha is exposed as a result of human intervention.

The marshes of marshes have subsided as a result of human intervention. (72%). Figure No. (3)

The use of saline areas in constructing buildings. (69%). Figure No. (4)

Negative impact on the environment and roads as a result of human intervention in sabotage. (77%). Figure No. (5)

Buildings are cracked, and foundations eroded due to soil instability. (71%) Figure No. (6)

Not identifying buildings by determining saline areas. (71%) Figure No. (7)

Figure (3): The sabkha soils sink as a result of human intervention

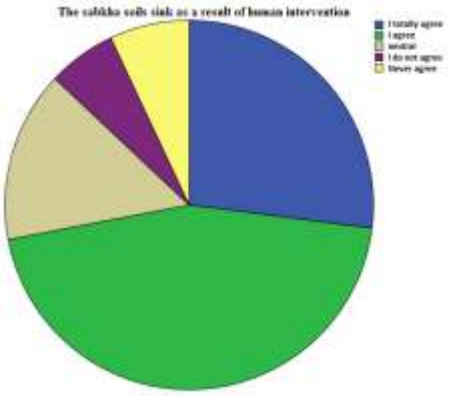


Figure (4): Using saline areas in constructing buildings

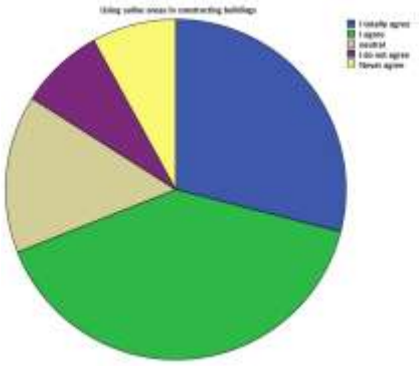


Figure (5): The negative impact on the environment and roads as a result of human intervention in the sabkha.

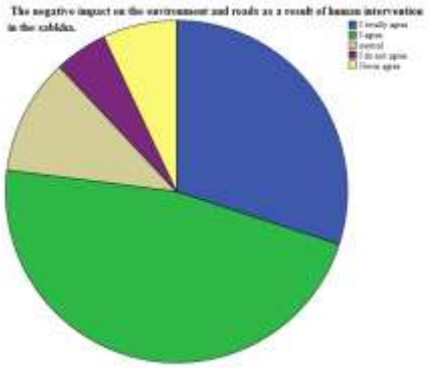


Figure (6): Fractured buildings and erosion of their foundations due to soil instability

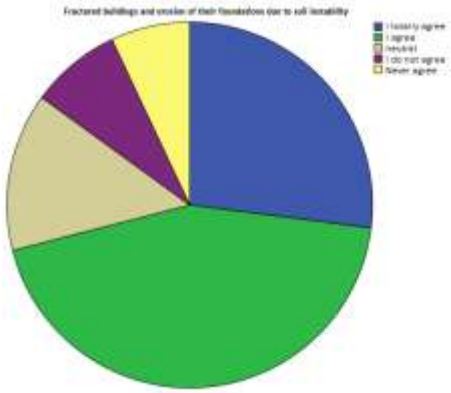
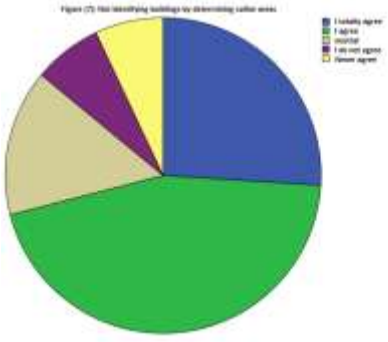


Figure (7): Not identifying buildings by determining saline areas



3.3.2.2.3. Means to reduce the risks related to sabkha

Table No. (4) Shows the results of testing the percentages, arithmetic averages, and standard deviations of the means to reduce risks related to sabkha.

Table (4): The percentages, the arithmetic mean, and the standard deviation of the means for reducing risks of sabkha.

Axis	Axis items	Percentages	Arithmetic Mean	Standard Deviation
The possibility of replacing sabkha deposits with good ones	I totally agree	**30%**	**2.14**	**1.10**
	I agree	**44%**		
	neutral	**14%**		
	I do not agree	**6%**		
	Never agree	**6%**		
Fixing marshy soil to reduce soil subsidence	I totally agree	**28%**	**2.19**	**1.09**
	I agree	**43%**		
	neutral	**16%**		
	I do not agree	**8%**		
	Never agree	**5%**		
Expanding the digging of	I totally agree	**29%**	**2.18**	**1.11**

agricultural drainage canals with their regular cleansing	I agree	**43%**		
	neutral	**15%**		
	I do not agree	**7%**		
	Never agree	**6%**		
Building foundations for houses in villages near sabkhas from basalt rocks available in the area	I totally agree	**35%**		
	I agree	**37%**		
	neutral	**15%**		
	I do not agree	**7%**		
	Never agree	**6%**		
Failure to build the lower parts of the walls of houses close to the surface of the earth from the sediments of the scorching, due to their rapid erosion	I totally agree	**34%**	**2.13**	**1.14**
	I agree	**38%**		
	neutral	**15%**		
	I do not agree	**7%**		
	Never agree	**6%**		
Painting various lighting poles with insulating paints	I totally agree	**31%**	**2.16**	**1.10**
	I agree	**39%**		

	neutral	**18%**		
	I do not agree	**7%**		
	Never agree	**5%**		
The construction of roads on a level higher than the level of the sabkha roofs, at a level not less than a meter, and providing them with a thick layer of gravel.	I totally agree	**28%**	**2.26**	**1.14**
	I agree	**39%**		
	neutral	**18%**		
	I do not agree	**9%**		
	Never agree	**9%**		
Use of certain types of rebar available in concrete	I totally agree	**33%**	**2.17**	**1.16**
	I agree	**37%**		
	neutral	**16%**		
	I do not agree	**8%**		
	Never agree	**6%**		
Changing the prevailing flood irrigation system and using new styles such as	I totally agree	**31%**	**2.19**	**1.13**
	I agree	**38%**		
	neutral	**18%**		

sprinkler and sprinkler irrigation	I do not agree	**7%**		
	Never agree	**6%**		
Soil structure amendment and soil wash	I totally agree	**32%**	**2.13**	**1.12**
	I agree	**41%**		
	neutral	**15%**		
	I do not agree	**6%**		
	Never agree	**6%**		
Add appropriate fertilizers and plant suitable crops	I totally agree	**35%**	**2.14**	**1.15**
	I agree	**35%**		
	neutral	**17%**		
	I do not agree	**7%**		
	Never agree	**6%**		

From the previous table and the following graphs, it is evident that all sample members agree to the means of reducing the risks related to sabkha, which are as follows according to the different percentages of approval:

The possibility of replacing sabkha deposits with good ones. (74%). Figure No. (8)

Fixing marshy soil to reduce soil subsidence. (71%) Figure No. (9)

Expanding the digging of agricultural drainage canals and clearing them periodically. (72%). Figure No. (10)

Building foundations for houses in nearby villages of sabkhat from basalt rocks available in the area. (72%). Figure No. (11)

Not building the lower parts of the walls of houses and close to the earth's surface from the sediments of the scorching due to the speed of their degradation. (72%). Figure No. (12)

We are painting the various lighting poles with insulating paints. (70%). Figure No. (13)

Construction of roads on a level higher than the level of sabkha roofs, at a level not less than a meter, and providing them with a thick layer of gravel. (67%). Figure No. (14)

Use of certain types of rebar available in concrete. (70%). Figure No. (15)

Change the prevailing flood irrigation system and use new styles such as sprinkler and drip irrigation. (69%). Figure No. (16)

Modify soil structure and wash soil. (73%). Figure No. (17)

Add appropriate fertilizers and plant suitable crops. (70%). Figure No. (18)

Figure (8): The possibility of replacing sabkha deposits with good ones

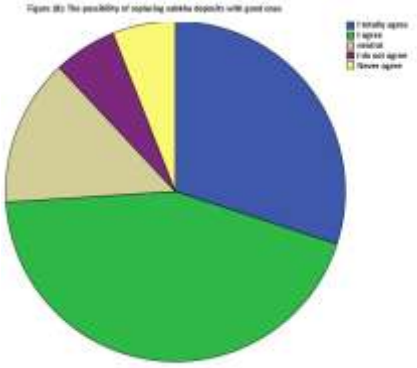


Figure (9): Fixation of marshy soil to reduce soil subsidence

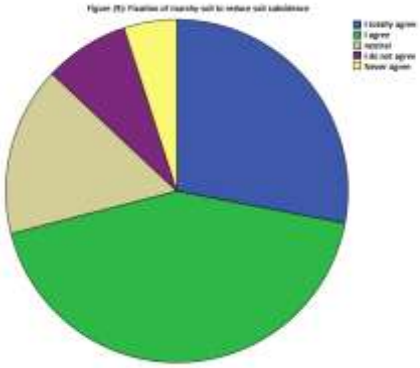


Figure (10): Expanding the digging of agricultural drainage canals and clearing them periodically

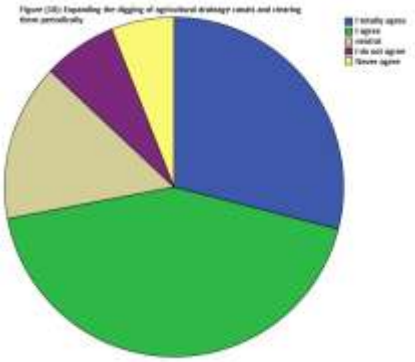


Figure (11): Building foundations for houses in nearby villages of sabkhat from basalt rocks available in the area

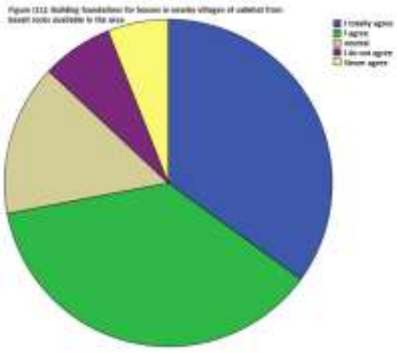


Figure (12): Failure to build the lower parts of the walls of houses close to the surface of the earth from the sediments of the corchif due to the speed of their decline

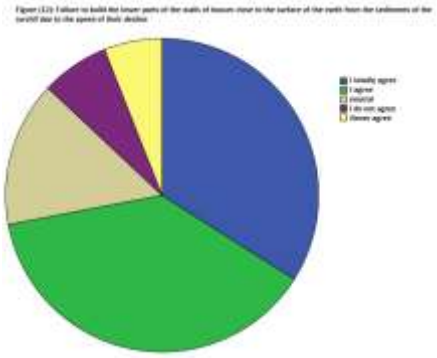


Figure (13): Painting the various lighting poles with insulating paints

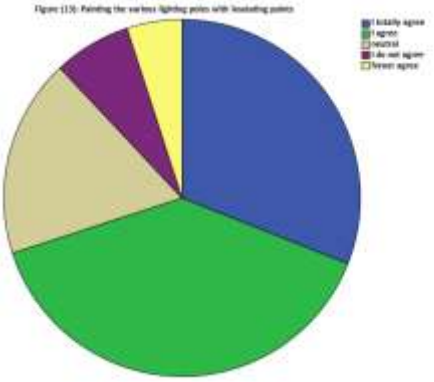


Figure (14): Building roads at a level higher than the level of the sabkha roofs at a level not less than a meter, and providing them with a thick layer of gravel

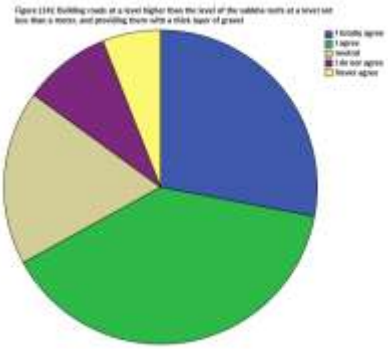


Figure (15): The use of certain types of rebar available in concrete

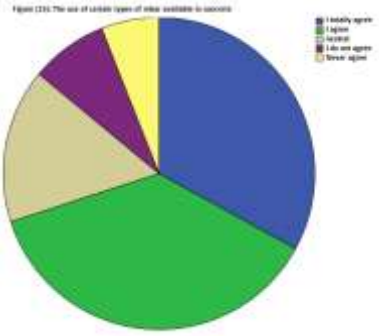


Figure (16): Changing the prevailing flood irrigation system and using new patterns such as sprinkler and drip irrigation

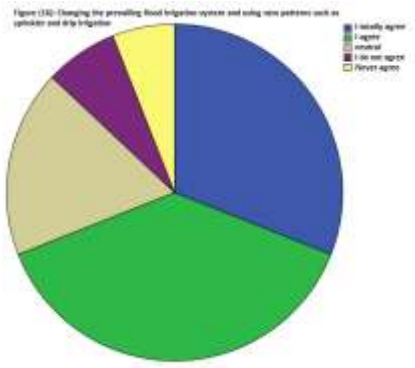


Figure (17): Modifying soil structure and washing soil

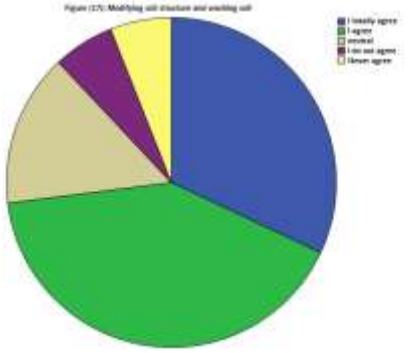
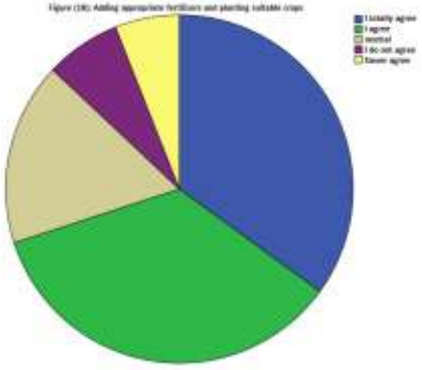


Figure (18): Adding appropriate fertilizers and planting suitable crops



3.4. Analysis of the study hypotheses

There is a statistically significant relationship between the dangers to the sabkha resulting from human intervention and the means of reducing the risks of sabkha in the Qasb city.

Table No. (5) shows the Pearson correlation coefficient results between the dangers to which sabkha are exposed as a result of human intervention and the means to reduce the risks of sabkha in the Qasb city.

Table No. (5)

	Means of reducing the hazards of marshes in the Qasb city
Hazards to sabkha resulting from human intervention.	0.827

It is evident from the previous table that there is a positive relationship of statistical significance (0.827) between the dangers to which sabkha are exposed due to human intervention and the means of reducing risks related to sabkha in the Qasb city.

Table No. (6) Shows the results of the Spearman correlation coefficient between the dangers to which sabkha are exposed as a result of human intervention and the means to reduce the risks of sabkhat in the reed city.

Table (6): the results of the Spearman correlation coefficient between the dangers to which sabkha are exposed due to human intervention and means to reduce the risks of sabkhat in the reed city

	Means of reducing the hazards of sabkhat in the reed city
Dangers to sabkha resulting from human intervention	0.774

It is evident from the previous table that there is a positive relationship of statistical significance (0.774) between the dangers to which sabkha are exposed as a result of human intervention and the means of reducing risks related to sabkhat in the city of the reed.

IV. Conclusion and recommendations

4.1. Conclusion:

This study focused on analyzing the relationship between the dangers to the sabkhat resulting from human intervention and the means of reducing the risks of sabkha in the Qasb city. in an analytical framework by analyzing

a questionnaire on studying the dangers to the sabkha resulting from human intervention and determining the potential for future development and optimal use of the marshlands In the Qasb city.

The study concluded that there is a positive relationship of statistical significance between the dangers to which sabkha is exposed due to human intervention and means of reducing the risks related to sabkha in the Qasb city.

4.2. Recommendations:

Since the study found that there is a positive statistically significant relationship between the dangers to the sabkhat resulting from human intervention and the means to reduce the risks of sabkhat in the Qasb city, the study recommends a greater focus on finding ways to reduce the risks of sabkha in the Qasb city.

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