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# The natural and environmental resources in the marshes and the means of their investments (Chebaish as a model)

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**Abstract.** The marshes are possessing natural economic capabilities and environmental resources and unique biological diversity. It inhabited by thousands of citizens for thousands of years, as these residents relied heavily on the natural environmental and economic resources which they depend on them as a basis for their livelihood, and given the increasing continuous demand for these resources as well as the frequent government neglect for this environment, for these reasons the research problem resulted from the weak investment of natural and economic environmental resources and their excessive and unsustainable exploitation, which led to an imbalance in the environmental and economic balance of the region. The main goals of the research were to maintain the natural resources in sustainable and sustainable economic activities for the residents and to achieve the goals of sustainable development, and the research adopted the hypothesis that natural and economic resources can be sustained through sustainable spatial development by activating institutional aspects as well as environmental awareness, which will enhance their sustainability in the present and the future. To achieve this, a complete survey of villages and human settlements in the study area was conducted, as well as a determination of the proportions of the economic activities and their geographical distribution. The research concluded that there is unsustainable use and un-environmentally sound methods for some natural resources through some economic activities such as fishing for fish and birds, as well as a lack of interest and governmental neglect for some of the economic activities, such as buffalo breeding and milk production. The research reached the most important recommendations of the necessity of activating sustainable spatial development and the existence of great opportunities to invest better and sustainable natural and economic resources as well as developing the eco-tourism aspect, to achieve the well-being and prosperity of the inhabitants as well as to preserve the marshes, their integrity and their sobriety within the list of world heritage and their international environmental agreements.

## 1. Introduction

The marshes are a great national wealth that possesses many unique characteristics, natural and environmental resources, and due to its distinguished geographical location between three governorates in the southern regions, it has made this region an outstanding environment, which has been inhabited by thousands of citizens over thousands of years, and they have relied on their livelihood and source of livelihood on this natural environment. Moreover, the marshes possessing some international standards that helped them to include on the World Heritage List, due to the existence of the exceptional global



value, and that these resources need care, special attention, and sustainable methods for the purpose of preserving them from deterioration, as well as losing their sobriety and integrity within the most important conditions required in order to preserve this environment within the World Heritage List. The research aims are 1- Preserving natural resources in a sustainable manner and the economic activities of the inhabitants, in order to achieve the goals of sustainable development, 2- Choosing sustainable methods that are compatible with the nature of the natural and environmental resources and in harmony with the nature of the economic activities in the region. The scope of the study will include the city of Chebaish can e considered locally but their effect regionally and internationally. The last literature studies discussed the marshes on general topics without taking into account the sustainability of its natural and environmental resources; the research specialized in utilizing the natural and environmental resources in a sustainable manner.

### *1.1. Research problem*

Weak investment of natural and ecological resources and their excessive and unsustainable exploitation, which led to an imbalance in the ecological and economic balance of the region.

### *1.2. Research hypothesis*

Natural and economic resources can be sustained through sustainable spatial development by activating the institutional aspects as well as environmental awareness, which will enhance their sustainability in the present and in the future.

### *1.3. Research Methodology*

- 1- A field survey of villages and human settlements in the study area was conducted.
- 2- Conducting a questionnaire on the most important topics of special interest in natural resources and means of sustainable investment.

## **2. Marshes and it's classification**

The Iraqi marshes are one of the largest wetlands in Southwest Asia, and their range extends over an area of more than 20,000 square kilometers. This is due to its unique biological diversity and cultural richness, and permanent habitat for birds and one of their migration paths, in addition to being a habitat to the Arabian Gulf fish that live in freshwater, and despite its environmental importance mentioned above; The marshes are distinguished by their occupying a prominent place in the cultural and global heritage, as most scientists believe that it is the "Garden of Eden" mentioned in the Bible [1].

The marshes are slightly lower than the river, and their area is close to or greater than the previously mentioned area, the area of some countries such as Qatar, Lebanon, Kuwait, Bahrain and others, and they are characterized by environmental, climatic and hydrological characteristics. Plants, water, fish, birds and other organisms, which are the outcome of natural selection for tens of thousands of years, represent a moving natural museum that connects us with ancient and ancient civilizations. We can consider marshes as part of wetland. Ramsar Convention defined as: ‘Peat land or water, whether natural or industrial, permanent or temporary, and whether it contains constant or flowing water, fresh, stagnant or salty water, including areas of marine water whose depth does not exceed at the minimum height of six meters. (Article 1 of the Ramsar Convention on Wetlands, 1971) [2] [3] The marshes “are lowlands that are covered by water, whether at all days of the year or in some of them, and there is no clear difference between the marshes and swamps” [4] The marshes are considered ancient In Mesopotamia, a distinct human civilization belong to about 6000 years was established on it. It is also called the cradle of civilizations, as in the last years of the twentieth century it became a home for more than (500,000) marsh dwellers [5].

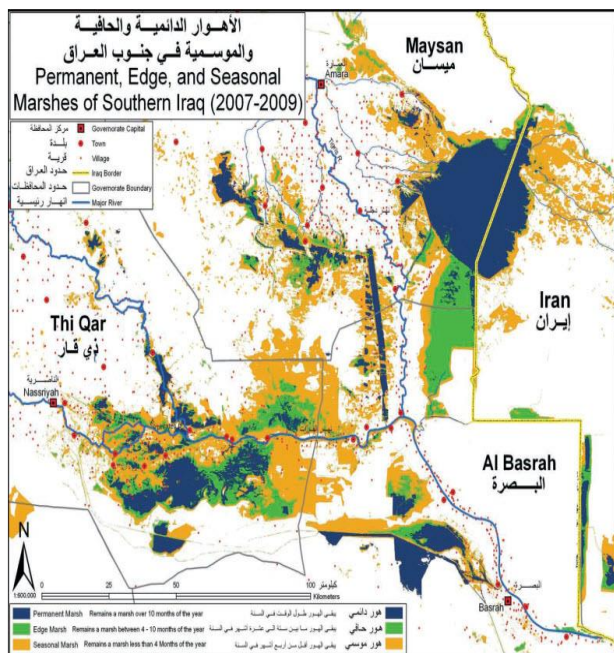
### 3. Geographic location of marshes

The marshes in southern Iraq are wetlands with a unique ecosystem located between and on both sides of the Tigris and Euphrates rivers. The marshes include large areas in each of the three southern governorates (Maysan, Dhi Qar, and Basra) and they are formed in the form of a triangle anchored in Basra and the ends of its base in each of Dhi Qar and Maysan [6] and gradually create the area between the two rivers as it begins to divide into several branches, as the marshes in the lower Mesopotamia stretch from Samawah on the Euphrates and Al-Kut side on the Tigris side of Basra to the Shatt al-Arab side, since the marshes consist of a series of groups of Small lakes and marshes that drain from one to another, and as a result, some marsh units merge with each other to form larger marshes. The heart of the marshes is concentrated in the area around the confluence of the Tigris and Euphrates rivers. [7] See Figure 2 representing the main marshes and their geographical location in southern Iraq. The marshes consist of three interconnected systems of the central marshes, the Hammar marsh and the al-Hawizeh marshes, which are linked to the Arabian Gulf by the Shatt al-Arab. The Iraqi marshes have been drought, for the most part, through deliberate actions by the former regime. Many engineering facilities were built within more than 30 dams along the Tigris and Euphrates rivers over 100 years to control water flow, irrigation, public water supply and electric power generation. As a result, this led to a significant decrease in the amount of water coming into the marshes, especially the facilities built in years. 1990, which was mainly intended to drain the area. [8] The marshes are mainly spread in the three southern governorates, namely Dhi Qar, Maysan and Basra. Its marshes constitute more than 80% of the total area of the Iraqi marshes in general. The areas of the marshes vary and vary naturally between seasons and between years according to the levels of water levels in the Tigris and Euphrates rivers and their branches, which originally count on the amount of precipitation in the sources and basins of these rivers. The neighborhood, with the highest level,



**Figure 1.** main marshes in Iraq  
Resource: Hamdani, Abdulmir (2011) "Archaeological survey of marshlands of southern Iraq", UNEP and UNESCO, p3

forms shallow water bodies whose height in some places does not exceed one meter, and there are also the edge marshes that cover some months of the year. [9] See Figure 2 representing the permanent, seasonal, and edge marshes of the marshes of southern Iraq.



**Figure 2.** Seasonal, permanent and edge marshes in southern Iraq

Source: Canadian Initiative for the Revitalization of the Marshlands of Iraq (2010): "Atlas of the Iraqi Marshlands", Canada, 2010, p. 39.

#### 4. Global significance of marshes

As for the importance of the marshes in general, it can be summarized as follows: (10)

- 1- It contains a large number of energy sources such as oil and gas.
- 2- The possibility of getting rid of harmful pollutants (minerals and floating materials) in the water, as soil life decomposes organic waste to reduce its harm.
- 3- It is characterized by natural environmental beauty and Iraqi cultural heritage and its possession of immortal archaeological sites, as well as observatories for observing wildlife, traps and bird watching, so it is an important site to attract tourists
- 4- It can be considered as a large warehouse for raw materials, including papyrus and reed, and the possibility of using them in paper industries and housing.
- 5- It is characterized by being an environment with unique biodiversity (fish, benthic fauna, plankton, birds)
- 6- Storage and preservation of water flowing from the Tigris and Euphrates rivers, estuaries and tides.
- 7- They reduce desert encroachment and the formation of dust storms and contribute to moderating the atmosphere.
- 8- It is considered a link between salt and fresh water.



## 5. Study Area (Chebaish marsh)

The study area in the central marshes was chosen for the city center of Chebaish district, for the rural human settlements adjacent to the marshes, which are part of the central marshes. As the central marshes extend in general, and as mentioned previously, between the governorates of Dhi Qar and Maysan, between the Tigris and Euphrates rivers, with central coordinates (37 05 07 N-E 47 03 15) and the southern border extends along with the Euphrates River, and the Tigris River is located east of the marsh, bounded on the east side also the Basra Governorate (West Qurna), the area of the main central marshes (core area) is 83958 hectares, and the area of the safe zone (buffer zone) 14393 hectares. [11]. As for the study area, it will be limited to the specified area within the administrative boundaries of the city center of the Chebaish district within the central marshes mentioned earlier.

It is worth noting that in Dhi Qar governorate there are five important sub-marshes that are part of the three main marshes (the central marshes, al-Hammar and al-Hawizeh). These marshes differ in their characteristics and the way they are fed with water, which is each of [12]

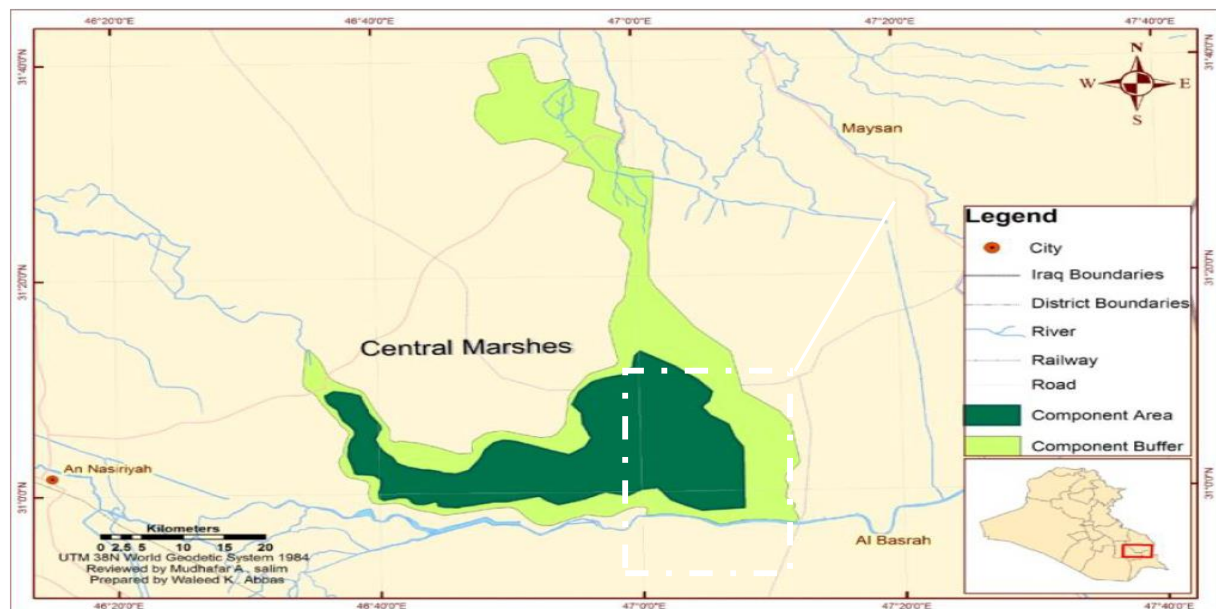
- Al-Senaf marsh: fed from the Euphrates River, with an area of 206,000 dunams, and it extends between the Karmashiya area, south of the Al-Shuyoukh district, to the Karma Bani Said district.

- The Adel marsh: it extends from the administrative district of Al-Tar to the district of Suq Al-Shuyoukh and fed with water from the Euphrates River.

- Al-Hammar marsh: Al-Hammar marsh is located along three cities (Al-Tar, Al-Fahood, Al-Hammar, and Al-Chebaish) , and it is concentrated in Al-Manar district (Al-Hammar previously), with an area of 485,600 dunams.

- Al-Chebaish marsh: It is located in the city of Chebaish and feeds mainly from the Euphrates River through several branches, and through Abu Zark marsh from the Al-Gharraf River.

Abu Zark marsh: The lake is located in the Islah district and covers an area of 64,000 dunums. Water from the Tigris feeds through the Al-Gharraf River.



**Figure 3.** The location of the Al-Chebaish marsh component and its vicinity

Source: Iraqi Ministry of Environment (2014) “*The Marshlands of Southern Iraq: A Biodiversity Refuge and Remaining Landscape of Mesopotamian Cities (Management Plans for Natural Components)*”, p 32 .

## 6. Natural and environmental resources in study Area

The study area, in general, has many natural and environmental resources that have given this site great economic, social and environmental importance, and the most important of these resources are:

### 6.1. *Agricultural lands*

The agricultural sector occupies a prominent position in the region's economies due to its diversification of production. The beginnings of this activity go back to the early settlement of the indigenous Sumerians and the practice of primitive agriculture in the region. Agriculture, trying to take advantage of the soil's moisture, especially since it depends on irrigation, which made it a catalyst to urge people to solve complex problems related to the delivery of water to their farms, and this was the beginning of the stage of civilization [13]. Agriculture is represented in the marshes isn't guaranteed the results because the people are unable to control water resources, the rice cultivation is limited to areas that are submerged in water during the flood season. The high-level areas from which water recedes before others in the summer season are planted with strategic crops and commercial vegetables. As for palm cultivation, it is restricted to the banks of the marshes, and the central marshes are considered among the distinct areas at the level of the marshes in southern Iraq are agricultural production and the diversity of agricultural crops such as fruits, vegetables and grains. In terms of agricultural production that has been overflowing with need, creating commercial awareness and creating a new social situation in the region, according to the statistics of the Agriculture Directorate of the Governorate (Dhi Qar, Maysan Governorate, and Basra Governorate), the crops of cereals, rice, dates, leafy vegetables and sidr are among the five main agricultural products in the region. Villages of the central marshes, that the total harvested areas actually amount to (28580) hectares, and their total production reaches (114540) tons/year.

### 6.2. *Biodiversity*

The marshes in general and the study area, in particular, are characterized by a unique biological diversity, and this is what made them home and home for thousands of people for thousands of years, and that the most important components of biological diversity are:

#### 6.2.1. *Natural plants*

The environment of the marshes, including the study area, is characterized by the presence of certain varieties of plants that grow naturally, and the plants in the marshes are divided into several types, some of which are immersed plants in the water and parts of them may appear outside the water, and there are floating plants that float on the surface of the water and extend their roots through the water to settle At the bottom and sometimes they extend over the surface in a continuous manner to prevent the sun's rays from reaching the water. With the exception of the deep ones, and less or no in the temporary marshes in the areas close to the population settlements, as for papyrus it is considered one of the main and important types in the marshes and its importance comes after the reed plant, and they spread together in the permanent marshes, and the papyrus spread separately in the temporary marshes. [14]

#### 6.2.2. *Birds*

The marshes and the study area are especially famous for their biodiversity and cultural richness, as they are a permanent habitat for millions of birds and paths for millions of migratory birds between Siberia and Africa. There are more than 130 species of birds found in the marshes and most of the rare species there are, for example, 40% -60% of the marbled teal birds of the world population congregate in them, and also 90% of the number of birds of The Basra reed warbler is one of the world's largest congregate, which is believed to be on the threat of extinction, as well as many other common and endangered bird species. [15] See Figure (4) photos of the two birds previously mentioned.

Due to the importance of biodiversity in general and its privacy in the marshes, Iraq has joined many international agreements, including the Convention on Biological Diversity (CBD).



**Figure 4.** Birds of marbled teal birds and Basra reed warbler  
Source: Muzaffar Salem, Nature Iraq

#### 6.2.3. *fishes*

The abundance of fish species found in the marshes has a great contribution to the value of biodiversity in them, as it is a habitat and the main food area and care for small, dichotomous fish species (that migrate from fresh and salt water) coming from the Arabian Gulf, and the abundance of fish species has led to the enhancement of the presence of The fishermen are local residents, and as such, it constitutes a resource base and a unique lifestyle for the Marsh dwellers. [16] And it was considered a source of food for all districts and sub-districts of Dhi Qar Governorate, as well as exceeding its local and regional borders in the country's governorates, and there are many and common types of fish in the study area.

#### 6.3. *livestock*

Cattle are an essential wealth to sustain the life of the population, and with the partial return of the marshes. After 2003, there is a noticeable increase in the number of livestock (buffaloes, cows, sheep), and this wealth was distributed in different numbers between one region of the marshes, according to the appropriate environment for it, and can be listed as follows:

##### 6.3.1. *Buffalo*

The buffalo is one of the most important animals that are related to the water environment of the marshes of southern Iraq, and the geographical distribution of buffaloes in Iraq has passed through multiple time stages. This animal has settled in the environment of the marshes and swamps in southern Iraq for thousands of years [17]. Including in the production of milk and its products and meat, and the buffalo comes at the forefront of the animals of economic importance that are unique to the marshes environment by raising them for the abundance of water, which is the basis of the sustainability of their life., large part of them are exposed to perish due to water scarcity, lack of food and diseases, and what remains of them have moved with their breeders to other areas (researchers reviewing). The number was (477,000) in 1982, and by 66%, we see an increase in the number of buffaloes compared to the rest of the livestock due to the large area of the marshes in them compared to the grassy areas that are suitable as pastures for raising livestock. The climatic conditions are good and the water is fresh, while the number of buffaloes in 2018 reached (58,316) 27%. The inhabitants of the marshes are interested in raising a female buffalo because



she is a source of livelihood for what she generates from milk, as she produces between (4-5) liters/day if the feeding is based on reeds only, while she is more than (5) liters/day if her nutrition is varied from reeds, corn remnants, wheat and bran [18].

#### 6.3.2. *Cows*

Cows are one of the most important animals that have economic returns, and they occupy the second place after buffalo, and cows vary in their numbers, and this discrepancy in numbers is due to the fact that cows and livestock need grassland and not water, that is, the provision of natural and human conditions for their breeding. One of the most important of these is the provision of natural pastures, especially near the banks of rivers, so such an environment does not accommodate large numbers for their breeding, so these numbers were limited, whose existence is economically complimentary to buffaloes, especially selling them or making use of cows' milk to meet the needs of the local market [19].

### 7. **Industrial potential (local and folkloric industries)**

The local handicrafts depend on the available local raw materials, which were in response to the requirements of the water environment and meet the requirements of the local market. There is no doubt that the existence of such industries is one of the encouraging factors for the process of spatial development or nature tourism, and it also contributes to providing a material return for the people who live in the marsh areas. Because the tourist is keen to see or acquire some of the popular manufactures because the popular industries in any place reflect a person's stimulation of his environment and the extent of his ability to harness it to serve his goals and interests. The popular industries in the marshes will be divided according to the primary materials used in the industry:

#### 7.1. *Local industries that depend on reeds and papyrus*

##### 7.1.1. *The mats industry:*

This industry has great importance for the inhabitants of the marshes for its economic returns and it supports large numbers of the population, as it has become not limited to the local market in the marshlands, but has been exported to the districts and cities adjacent to the marshes, in addition to the reeds being included in the decoration and furnishing of houses of a special heritage. In the environment, it is often used as a raw material for building and roofing houses by residents with low economic incomes. As for the marshes of Dhi Qar, the manufacture of the mat has been concentrated in the district of Chebaish and Al-Hammar, and its production ranges between (300 - 450) mat per day, but after 2003 to the present time the number of the factory from mats has (2,400 - 2,700) sheets per day. Most of the mat production is marketed to the districts and cities adjacent to the marshes and distant governorates in addition to city centers ( Dhi Qar,) and the rest of the districts and areas surrounding the marshes and since the marketing process of the product needs other places to spread of the product, this means that there is an integrative process between the study area and other areas outside the area.

##### 7.1.2. *fruit making*

It is a food industry that depends on the fruits of papyrus, and the raw material is ears that appear in the pulp of the papyrus tree during the spring season, often followed in the markets, and its market is popular during the spring season [20], as the quantity of production varied due to drying processes and climatic conditions.

### *7.2. The industries that depend on the date palm:*

Palm trees are spread in the areas adjacent to the marshes and in the high lands located on the cliffs of the marshes, which are similar to the island areas. Palms are used for roofing barns and huts, while palm fronds and palm leaves are used in many industries as follows:

#### *7.2.1. Pressing dates*

Date palm trees are spread in the Euphrates River and the surrounding areas, and this industry is concentrated in the marshes of Dhi Qar in the area of Al-Fahood and Al-Chebaish. For the inhabitants of the region, however [21], this industry has deteriorated due to the destruction of large areas of palm trees due to the high salinity of the soil and the drying that previously accompanied the area, and that most of the date production is exported to the districts and sub-districts surrounding the marshes and the rest of the governorates, in addition to exporting to the Arab Gulf states.

#### *7.2.2. Mats making*

It is an industry that mainly relies on palm fronds as main and only raw material, some of which are used for bedding purposes and are called (mat) and they differ from the mat made of reed, and among them is what is used for the purpose of carrying the purposes and is called locally (Zabeel), and some of them are used for the purpose of pressing dates and are called locally (Safyfah or Gassafah)

#### *7.2.3. Other industries that depend on palm leaves:*

It is represented by the manufacture of cages and chairs, which is one of the industries that depend on palm leaves, and there are other industries that combine palm wicker and running as raw materials and make beautiful folkloric shapes, especially since palm wicker is dyed in bright and beautiful colors.

### *7.3. Industries related to the aquatic environment*

#### *7.3.1. Manufacture of boats (Mashhoof)*

Because of the water environment, the boating industry has flourished because it is the main tool of transport in those areas. Al-Huwair region is an important area for this industry in the marshes of southern Iraq. Despite the fact that this area is outside the study area and the area's residents need boats because it is the most used method in their areas and because it serves them and serves their business, it is necessary to shop for the product from outside the study area (in this case) as it achieves the integrative process of the region [22].

#### *7.3.2. Ship tar*

This industry is considered the last stage of the ship's work, where the person responsible for placing the tar on the outside of the ship and the contact with the bitumen will prevent the entry of water into the ship's interior and are used in the marshes of the south and the branches of the Euphrates [23].

#### *7.3.3. Salt collection and drying:*

There are other industries in the marshlands, but they are of limited importance, such as the salt extraction industry. These salts are deposited at the edges of the marshes, after which they are collected by the inhabitants after the shallow water is exposed to evaporation, leaving the salts on the ground and then collected and transferred to factories to be manufactured into salts used for human consumption, unless Most of the production is consumed in industries most of which are produced locally, such as dairy products, and the other part is marketed to the districts and areas surrounding the marshes to be used by the ice plants without treatment [24].

## 8. recreation Tourism

In general, the marsh is a unique aesthetic site as a natural scene, which can be used in general for the purposes of tourism and entertainment, as the natural landscape of the marsh with the presence of most of these development potentials combined, as well as the spread of the local population within the marsh and the presence of livestock, reed bushes, papyrus, canals and waterways as a hydraulic system. It gives a beautiful mosaic and panorama with wonderful natural scenery giving a wonderful picture of environmental beauty.

The natural environment of the marshes in southern Iraq and its unique characteristics create a vital tourist facility visited by tourists and enjoying its views and unique life from inside and outside Iraq, and to become a force of attraction, entertainment, and recreation, and here consider as the economic and social importance of this unique natural environment as well as what it contains economic benefits. Others, on the way to investment, in addition to the swamp marshes, providing the appropriate conditions for the presence of large animal wealth and many numbers and types of birds, as well as the natural aquatic environment gained the area an attractive force for many types of fish and due to the beautiful natural characteristics of the study area, it provides great pleasure for the beautiful nature tourists and amateur hunting by organizing local, regional or international competitions for catching fish and birds, which abound in the region with its many and varied types.

## 9. Villages, human settlements and economic activities in the study area

Through the field survey carried out by the two researchers, it was found that there are 14 villages distributed outside the basic design of the city of Al-Chebaish, which is located on the outskirts of the Chebaish marsh, and through the research it was found that the people depend directly on the marsh, and it is worth noting that the economic development scientific is strongly and closely related. In the workforce, and therefore the economic structure occupies great importance, as there is no doubt that there are no development plans without being accompanied by plans for developing the workforce. and knowing the contribution of individuals in economic activities, will reflect the living and economic reality that will expand in light of the available job opportunities in the study area, which in turn is an indication of a degree of population stability for those human settlements.

For the purpose of determining the economic activities of most importance to the residents of the study area, it requires knowledge and determination of the percentage of workers in economic activities there, and undoubtedly it will contribute to the development of their settlements and their suitability to the available human and material capabilities. It is also possible to determine the age group that is from 15 to 64 years by the labor force, which is also represented by the economically active population, as their percentage, according to the field survey, reached 57%.

The economically active population can be defined as: "Population of both sexes at the age of (16) years and over, who are able to work, and who represent the available supply of work for the production of goods and economic services, whether they are working or looking for work." [25] Through the survey the fieldwork for the researcher was an inventory and survey of the most important economic activities practiced in the study area and the number of workers in it, and the data were as follows:

**Table 1.** Number of workers for economic activities in the study area

Name of village	No. of persons	Fishing and hunting birds	Animal husbandry	Reeds cutting	Agriculture	Fooding manufacture	Handicraft	Employment percentage%

Sabbaghia	550	160	110	30	25	20	3	63
Al-Rawajeh and Kasrah	1000	130	105	120	0	50	40	46
Al Sahaki and Al Breij	250	50	40	95	5	5	2	79
Abul-Narsi	1300	110	160	30	10	30	20	28
Abu Juilana	400	70	65	15	15	20	6	48
Al-Saraihat	530	100	125	30	2	35	30	61
Mawajid Abu Njeim	404	60	40	15	4	5	3	31
Mawajid Al Boucherji	400	80	60	10	2	7	2	40
Sumeida	225	15	10	3	0	3	2	15
Mawajid Al Buhawigm	1250	40	30	3	2	4	3	7
Al-Hasjah	540	20	170	80	10	90	3	69
Abu Sobat	520	80	40	20	2	3	3	28
Al bahhar	675	300	150	100	3	5	5	83
Al shateet	160	15	10	10	75	5	4	74
Summation	8204	1230	1115	561	155	282	126	
Percentage		15	13,6	6,8	1,9	3,4	1,5	

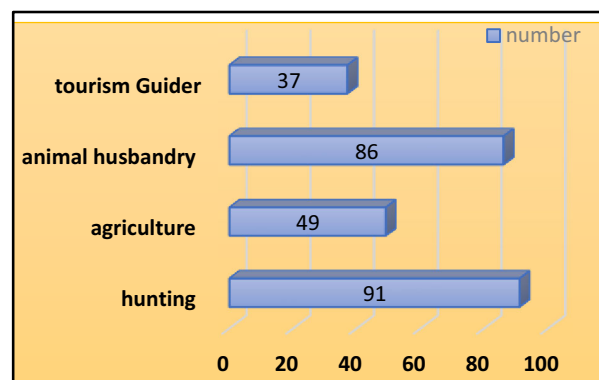
Resources: researchers depending on field survey

## 10. Questionnaire of dwellers and its results

A questionnaire was made for the people of the study area with regard to natural and environmental resources and some related topics, for the purpose of knowing the opinions of the people regarding the topics mentioned above, as the questionnaire consisted of six questions, as the community sample reached 1398 families and the research sample was approximately 212 samples, Appendix (1) Represents the questionnaire form for the people of villages and human settlements in the marshes.

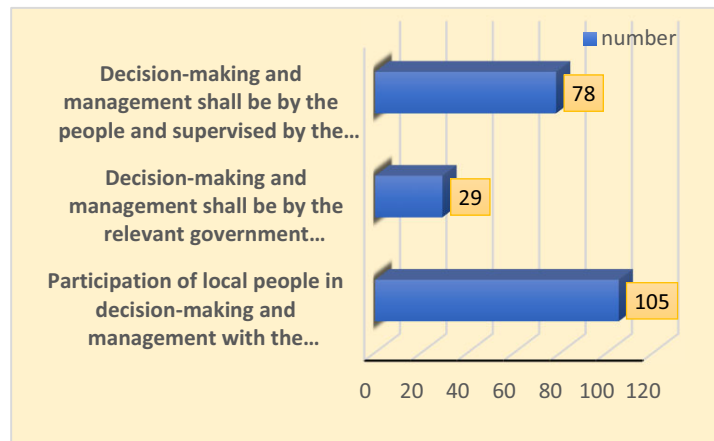
1- If the government contributes to providing job opportunities or supporting a means of subsistence, what is your favorite work or living:

Hunting	91
Agriculture	49
Animal husbandry	86
Tourism guider	37



2- Do you see that for the purpose of preserving the natural resources in the marshes (such as fish, birds and plants) and ensuring their survival, current and future sustainability, can be done through:

Participation of local people in decision-making and management with the government	105
Decision-making and management shall be by the relevant government departments	29
Decision-making and management shall be by the people and supervised by the government	78



3- Do you see any of the following things in the marshes and (according to importance and priority) that can be invested to contribute to the development of the villages and marshes?

Natural assets (fish, birds and plants)	First priority	94
Livestock (buffaloes and cows)	Second	104
Agricultural lands	Third	119
archaeological and tourist areas	Fourth	155

4-What are your favorite occupations to practice in your village?

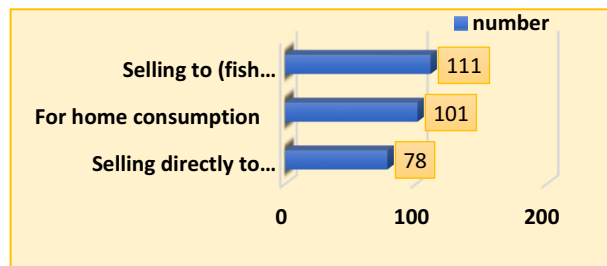
Note: The answer is according to the importance and priority of the numbers (1-2-3-4-5-6-7) and the number 1 represents the first priority, and so on

Cultivation	third Priority
Animals husbandry	first Priority
Fishing	second Priority
Tourism guider	fourth Priority
Reeds mat making	Fifth Priority
Grassing selling	Sixth Priority
Birds hunting	Seventh Priority



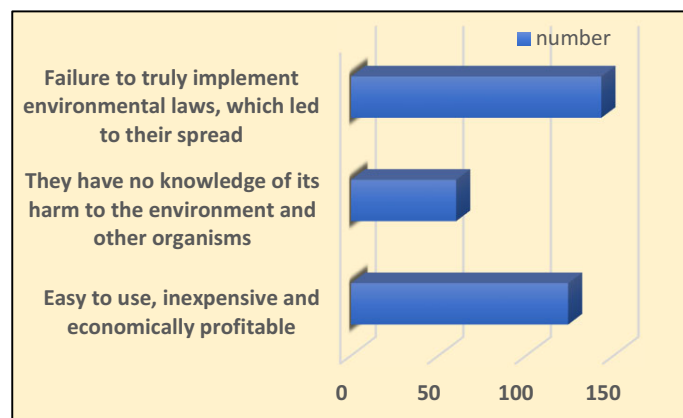
### 5- What do you do with the fish and birds caught?

Easy to use, inexpensive and economically profitable	124
They have no knowledge of its harm to the environment and other organisms	60
Failure to truly implement environmental laws, which led to their spread	143



### 6- In your opinion, which of the following reasons led to the spread of the phenomenon of electric fishing in the marshes (more than one reason can be chosen)

Selling directly to people and markets	78
For home consumption	101
Selling to (fish promoters)	111



## 11. Conclusions

1. Through the first question in the questionnaire it was found that the practice of fishing and birds and animal husbandry is one of the most desirable job opportunities for people, knowing that these two opportunities are natural resources and must be invested in a sustainable way by providing sustainable fishing methods for fish and birds using high-quality nets. Medium sizes and prohibit the use of nets with very small openings.
2. In the second question in the questionnaire that includes the preservation of natural resources in the marshes, such as fish, birds, and plants, the largest percentage reached the need for the participation of local people in decision-making and managing these resources in cooperation with the government. This requires the formation of associations for the people within the region. In the case of thinking to take any development investment project, it should be in coordination and cooperation with the people due to the need for sustainable preservation of the natural resources available in the region.
3. Through the third question, which includes the priority of investing in some natural and environmental resources, as natural assets such as fish, birds, and plants were the first priority in the field of developing villages, especially sustainable investment for them. As for livestock

(buffaloes and cows), it was a second priority, and agricultural lands a third priority. To invest in a sustainable manner through protected agriculture as well as establishing integrated agricultural projects.

4. In the fourth question, which includes what are the preferred occupations among the people of the study area, as animal husbandry was the first priority, fishing a second priority, in addition to agriculture a third priority, a guider and a tourism guider a fourth priority, and mats making the fifth priority, selling grassing a sixth priority, and hunting birds the seventh priority, These occupations represent the main use of natural and environmental resources in the study area, and all the tools used and methods used must be within the principles of sustainability, as well as thinking that the products of some professions complement and overlap with the products of other professions in order to preserve the natural resources from depletion.
5. The fifth question was about what fish and birds are caught, so most of the people's opinions were to invest in selling these natural resources, so the decision-makers should think about fish canning projects as well as providing places for the purpose of collecting fish and that these places be the infrastructure in which they are built from reeds and the possibility of The floor of the place was also covered with reeds, and thus we achieved sustainability from natural resources and not to include artificial resources that might affect the sobriety of listing the marshes on the World Heritage List.
6. To preserve these resources and know what are the most important causes of the spread of poaching phenomena, whether about fish or birds, as these two resources are considered the most important resource in the study area, so the question was what are the reasons for the spread of the phenomenon of electric fishing or any other negative phenomenon in the study area affecting the origin of natural and environmental assets, the largest percentage of answers was that environmental laws were not truly applied and government control was weak, as well as fishing with electricity is easy to use, is not financially costly and economically profitable.
7. One of the most important of these traditional craft industries is the mats industry, as this industry is a completely sustainable environmental industry by making use of the raw materials available in the study area, as the reed plant is used in it and is used in all stages of its emergence in the formation and manufacture of mats that can be used in many of the work in the study area, such as building houses and shelters, which are sustainable homes, or for other uses as mats for mats, and this process goes through stages, which are peeling and fluffing, then knocking, and then the final stage of knitting
8. Some villages are well-known for their production of such industries as Al-Saraih, Al-Rawajeh and Kasrah. There are other traditional industries that existed previously, but are currently spread very little, namely the industry (tabik, baskets, etc.). This industry is considered one of the most important folkloric and environmentally sustainable industries, which can be used as a product for sale to tourists or for household uses. There are other industries that are almost simple, but they exist and are used by the people in earning a livelihood and household uses, such as industries that depend on clay, such as making the (clay oven (tanoor)) for the purposes of baking bread, in addition to that there are some industries that have become extinct and scarce greatly, such as weaving and spinning wool to make folkloric woolen textiles that used to be A house is not without it in rural and non-rural areas.
9. Most of the infrastructure facilities are concentrated in the districts and sub-districts centers, and thus their distance from the villages and the difficulty of reaching them.
10. Most of the region's residents raise animals, the most important of which is the buffalo, which is the main source of their income, and it is one of the historical crafts inherited over the generations in this region.
11. A change in the housing pattern inhabited by the local population in the villages, moving away from building houses of reeds and resorting to the use of bricks and bricks in their construction,

and this affects the pattern of known housing in these areas. Most of the houses in the depths of the marshes are deserted by the people, who are currently inhabited by fishermen and buffalo breeders. Either their families live in other areas on the banks of the marshes.

12. Low protection of natural resources and their decline, the prevalence of the phenomenon of overfishing that threatens many types of fish and birds with extinction, in addition to the weakness and lack of centers for collecting milk and marketing their products, the lack of veterinary centers to care for buffaloes and livestock, low interest in agriculture, and the absence of centers for collecting milk, which leads to the spoilage of large quantities of it.
13. The presence of large quantities of two dairy products in the study area that can invest in a better sustainable way and be a developmental opportunity to employ unemployed people.

## 12. Recommendations

- 1- Encouraging the sustainability of folk crafts and traditional knowledge and enhancing its production in a manner that contributes to raising the level of family income in the marshes by opening marketing outlets by local governments and benefiting from the sale of local products by women.
- 2- Activating environmental laws to curb the phenomenon of overfishing or harming the ecosystem, which is a source of livelihood for the local population.
- 3- Developing fish wealth by preserving it, preventing overfishing, and following up and holding those who transgress and deal with toxic materials and electrical devices.
- 4- Developing the cultivation of reeds and sedge and taking measures that help spread them due to their importance and establishing handicrafts that provide job opportunities for the people of the region.
- 5- Activating the role of environmental policy to preserve the ecosystem. And impose strict fines for anyone who violates the environmental laws that have been published in all southern Iraq marshes in general and the central marshes in particular.
- 6- Protect the fertile lands on the banks of the marshes from the inundation, encourage their investors and support them to supply tourism with their agricultural and animal production, and encourage those who are willing to host tourists in their farms and establish a village similar to the Pharaonic village in Egypt and the city of Gaochang and the city of Jiaoha in China and make a hologram show of plants and animals that were domesticated in these areas and their dates that go back to the Sumerian eras or earlier.
- 7- Holding tourist-cultural festivals on a regular basis in the region with the aim of tourist attractions and in coordination with the relevant authorities and departments, whether at the local or international level, as one of the most important elements of the marketing mix.
- 8- The desire of most of the region's residents for tourism development, and they prefer tourism or activities. Most of them refuse fishing because they fear for their environment and their sources of livelihood, but they do not mind tourists taking their boat tours, and thus environment-based bio tourism can be activated.

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