An environmental assessment of the non-living natural resources and the available capabilities and their investment in Al-Najaf Governorate

Khalid R. Kadhim[1], Safaa Almudhafar[2], B. A. Almayahi[3]
[1]AL-Qasim Green University, Collage of Ecology, Department of Ecological Pollution, Iraq
[2]University of Kufa, College of Arts, Department of Geography, Najaf, Iraq
[2]University of Kufa, Faculty of Science, Department of Physics, Najaf, Iraq
Corresponding Author Email: basim.almayahi@uokufa.edu.iq

Abstract
It turns out that there are many raw materials, and these resources are involved in many industries, and among these industries are the extractive industries (gravel and sand factories) and the manufacturing industries (plaster and bricks) that depend on the available natural resources in the region, which are involved in the building and construction process, as well as the establishment of other industries Given the availability of these natural resources. As for the types of gypsum soils, silty clay soils, and existing clays, they are included in the plaster industry for the first type, and in the brick industry for the second type. These materials are used in the building and construction process and are marketed to different regions within and outside the province of Najaf. The province is also characterized by having mineral wealth that can be invested in industrial and productive projects, especially the cement industry, the glass and ceramic industry, and the brick, thermostone and lime industries, due to the availability of natural resources (raw materials) for these industries, represented by gravel, sand, limestone, feldspar, and clays represented by palliore slate and zeolite, which are present in high proportions in Bahr Al-Najaf area near Al-Tar area, which helped these minerals and raw materials in the development of many industries. Adopting the governorate and neighboring governorates with their needs of al-Nourah, the main material for the manufacture of limestone bricks and thermostone, in that the governorate has the ability to develop these industries and establish new construction industries that meet the growing market needs.
Keywords: Plaster and bricks, zeolite, Al-Tar area, minerals and raw materials

1. Introduction

Natural resources are of great importance in the continuity of life on earth and in its various forms, which determine the economic level of the population and contribute to determining well-being. All development plans depend on the size and quality of natural resources, and the state's strength and political weight depend to a large extent on natural resources. The importance of natural resources has increased in light of the large increase in population numbers and the accompanying increase in demand for natural resources, which prompted specialists to intensify efforts in study, research and writing for the purpose of defining the importance of natural resources, showing their types and spatial variation, and identifying the problems they suffer from in order to maintain them, which contributes to the attribution Planning for its investment, as well as raising awareness among members of society, which contributes to their partnership in the sustainable development of natural resources and the reduction of waste and environmental pollution. And man has been associated with natural resources in a dialectical relationship since time immemorial, since he was found on the face of the earth and he has been trying hard to exploit them in one way or another to cover his necessary and luxury needs.

Studying the natural resources of any region is necessary in geographical studies, including studies that deal with natural resources. To form a clear picture of the environmental conditions under which these resources were formed and existed. Natural resources are among the important sources in establishing development projects in the province of Najaf, because most of the development activities depend on them, especially agricultural and industrial activity, as well as tourism, and thus enhance the economy of the region, in addition to the fact that the province has clear natural capabilities at the level of availability of primary resources. Which makes its optimal investment a means to create a developed economic base, and according to the variation in the characteristics of the natural geographical capabilities in the province, the natural resources vary, so the study of the geographical capabilities in Najaf province was of great importance in investing the natural resources present therein (1).

2. Study Subjects

First - the geographical location of Al-Najaf Governorate

Second: Non-living natural resources in Al-Najaf Governorate

Third - the problems and obstacles that investors

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suffer from due to the current reality of natural resources in Najaf Governorate (the decline in the status of natural resources and the difficulty of investing them)
Fourth - (responding to challenges) to preserve natural resources
First - the geographical location of Al-Najaf Governorate
Al-Najaf Governorate is located in the southwestern part of Iraq, map (1), and it is in fact part of the western Iraqi plateau, but its borders do not exceed the administrative borders of Al-Najaf Governorate, and it occupies (90.06%) of its area of (28824) square kilometers. That is, it extends over an area of (25960) km² and takes in its extension a shape resembling a rectangle whose short southern side composes the political borders of Iraq with Saudi Arabia, while it is bordered from the north by Karbala Governorate and from the west by Anbar Governorate, while from the northeastern side the borders of the study area continue with The western edge of the sedimentary plain (west of the Euphrates River) and in the southeastern part it is bordered by the Muthanna Governorate, and it can be counted astronomically by two lines of longitude (−44°42 - −45°44) and two latitudes (−45°29 −19°32) (2).
Second - Natural Resources in Al-Najaf Governorate

The concept of resources

Know natural resources are everything in nature that man depends on in his life and achievements (3)
Natural resources are the cornerstone from which the importance of other aspects of human resources and cultural resources emanated. Natural resources were and still are the first incentive for human wealth resources, and human energy to work in order to benefit from them, that human progress and development depends mainly on natural resources that meet his demands and satisfy many of his desires and needs since the emergence of the human race on planet earth
The average per capita income and standard of living depend to a large extent on the state's possession of natural resources, in quantity and quality (4).

Types of natural (non-living) resources in Najaf Governorate

Non-living natural resources
They are represented by soil, water resources and minerals:

Soil

Soil is defined as the fragile layer that covers the rocks of the earth's crust with a thickness ranging from a few centimeters to several meters, and it is a mixture or a complex mixture of mineral and organic materials, air and water (40). Soil is considered one of the important natural resources as the main source upon which man depends for his food. Soil varies in its quality and suitability for agricultural production, and thus its ability to provide for the population in the region (41). This resource is exposed to continuous depletion, due to human interference in its irrational exploitation of it, and the consequent deterioration of agricultural production. The sedimentary plain is the product of primarily water sedimentation processes as well as some aerobic sedimentation (6).
The soils of Najaf governorate are dominated by sandy soils, but the percentage of sand varies from one place to another in the governorate depending on climate, geological factors and natural vegetation. The types of soils in the governorate can be distinguished Fig. (1):

The soils of the sedimentary plain region:

The soil of the sedimentary plain is formed through the sedimentation processes of the network of rivers and irrigation streams of crumbled rock materials and dissolved salts, as well as sedimentation brought by the wind, which enters it within the transported soil (7), and it is divided into:

The banks of rivers:

These soils extend on both sides of the Kufa and Abbasiya banks and the streams branching from them, and their height ranges between (2-3) meters approximately, and this height is clear in the north of the study area, especially at the Kufa district (42). from the riverbed. This soil is considered one of the transportable soils that were formed by the transfer of sediments as a result of frequent floods, and evaporation is relatively less than the soils of the shoulders of rivers, due to what is available to it from the remains of palm trees and orchards (8)

Soils of river basins

The soil of the river basins extends geographically within the lands that are located next to the shoulder areas of the rivers, and in the lands with a relatively low level, which ranges between (2-3) m from the level of the shoulders of the neighboring rivers (43). The soil of river basins is one of the oldest types of soils in which the agricultural investment process was practiced, and it includes what is known as the soil of poor drainage river basins. This soil is suitable in most of its sections for the cultivation of grains and vegetables, and the rapeseed crop is grown on a limited scale after carrying out reclamation operations in it, and it is distributed geographically in the region within (44). The area adjacent to the Kutuf al-Nahar area in the northern part of the governorate is from the lands located to the east of Shatt al-Abbasiya and west of Shatt al-Kufa (9).

Soils of marshes and swamps

These soils cover an area of 75% of the sedimentary plain, and include the soil of the lands of Mar Ibn Najm, Bahr al-Najaf, Mar al-Tawk, and Mar Salib, which were covered with marsh and marsh waters, but were recently dried as they were exploited for agriculture (45). Its surface is mostly covered with an alluvial layer, and it is located in the lowest region of the river basins. The degree of steepness, and cracks appear in it in the event of its drying, as well as some salt deposits appear in it, forming (sabkha). (10)

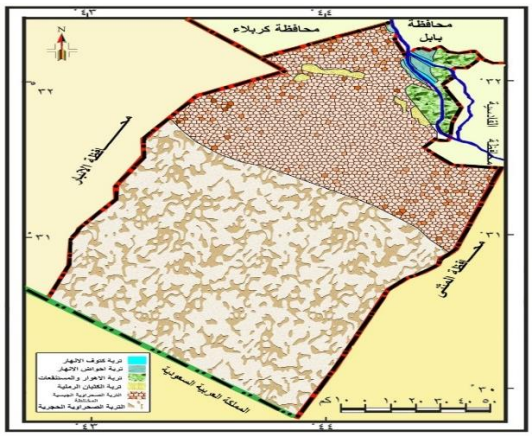

Figure (1) Soils of Najaf Governorate
Source: P.Buringh, soils and soil conditions in Iraq, (wagenigen: H. veenman and Zonen N.V, 1960) Map,1.

Soils of the Western (Desert) Plateau

The soils of the Western Plateau region cover large areas of the study area and its surface is covered with limestone and is considered poor in its organic matter, which amounts to less than (1%). Including that it contains a percentage of gypsum ranging from (0.1-81%). This is due to the small amount of rainfall that is not sufficient for soil washing operations, as well as the large thermal range and the accompanying weathering processes that make it in the form of rings or crystals, and the percentage of lime varies From (20-30%), which is also due to the continuous dredging operations mediated by what falls from the rains, and is characterized by the fact that it is loose soils consisting of the rocks of the same area and its vicinity, as the dry valleys during the rainy ages transported and deposited them over layers of calcareous, clay and sandy rocks.
The soils of this region are divided into three main types (11):

Gypsum desert soil

It is located in the area located to the west of Shatt al-Kufa within the Lower Valleys region (46). It is part of the sediments of the Euphrates River, characterized by its coarse texture. It consists of clay, silty and sandy crumbs of varying sizes, in addition to some calcareous materials and gravel. Within this range there are chains of sand dunes. This soil is characterized by a high The content of gypsum in it reaches (25%). The high percentage of gypsum is due to the evaporation of groundwater near the surface laden with calcium sulfate salts.

stony desert soils

These soils are located within the area of stones and are covered with stones and coarse limestone rocks with sharp angles (47). The predominant soils are sandy soils. They include about half of the area covered by the soil in this region and extend in the form of a wide range from the center of the region to the borders of the Republic of Iraq with the Kingdom of Saudi Arabia. The thickness of this soil is between (10-20) cm. It consists of limestone and sand (48). It is a shallow soil with a maximum permeability of 10 mm/hour. However, this low rate of permeability prevented the rainwater falling on its surface from leaking into the groundwater, which made it flow onto The form of sweeping torrents of fine soil atoms to the low areas on which they settle, which is also impermeable, which helped to lose them by evaporation.

sand dune soil

This soil is located within the range of sand dunes, which extends at a distance of (15-25) km from the west of the city of Najaf and to the southwest of it, and it rises above the neighboring lands by about (12) m.
From the foregoing, we conclude that the soil, being one of the natural resources in Najaf Governorate, has multiple importance and benefits (49). Soil is considered one of the important natural resources for humans, as it is the incubator environment for all plants and their source of food. It is a medium for the growth of plants and agricultural crops in which it is established and found in it, water, mineral salts, and organic matter. It is necessary for its growth, as it is a storehouse of water and a dwelling for many living creatures, which made it the main component of agricultural activity, which is the most important profession practiced by the population, and therefore the soil indirectly affects the geographical distribution of the population through their association in agricultural activity, especially as it is the approved raw material In the manufacture of most of the construction materials that are used in residential buildings and the basis for the construction of urban facilities (50). The soil also contains many mineral resources, which made it gain importance in industrial activity. Soil also has a direct effect on water resources through the volume of internal leakage. Soils with a coarse texture have large porosities, which increases the volume of water leaking into the depths of the soil. Therefore, the volume of groundwater recharge increases while the volume of surface water decreases. Otherwise, in soft soils, the volume of runoff increases. Surface and groundwater recharge is reduced due to the decrease in the volume of internal leakage (12). In addition, the soil contributes to influencing the distribution of natural plant species and some animals, and the soil and the organisms that live in it purify the water from pollutants such as viruses, oils, minerals, excess amounts of nutrients and various sediments.
It became clear that man has an important role in changing the properties of soil through the investment of land in agriculture, as tillage operations contribute to changing the structure of the soil and increase its permeability, and man also works to increase soil fertility by adding fertilizers and chemical fertilizers, and he also works to wash the soil and establish drainage projects, which rid the soil of Salts and excess water (51). In addition, agricultural activity contributes to raising the percentage of organic matter in the soil. On the other hand, the ill-

considered agricultural activity may stress the soil, deplete its resources, deteriorate its fertility and increase its salinity, especially in arid and semi-arid regions. Therefore, the soil is a limited resource, and this means that it is not possible to recover its losses and treat its deterioration easily. And in the end, in order for the soil to perform its various functions and provide its benefits to the entire ecosystem, we must preserve it, by avoiding dumping waste in it or burying it in the ground, and reducing the amount of materials and chemical fertilizers added to it; Because it will lose a lot of its fertility (13).

Water Resources

The water resources in Najaf governorate include all forms of water sources such as rain, surface water (rivers and lakes) and groundwater.

The water resources in Najaf governorate are divided (14):

Surface water

The surface water is represented by the Euphrates River and its branches, which enters the governorate from the northern side after its branching to the south of the city of Al-Kifl at a distance of (1 km), as it splits into two parts, the western part of which is known as Shatt Al-Kufa, while the eastern part of it is known as Shatt Al-Abbasiya Fig. (2), so attention With water resources as one of the natural resources, it is vital to cover the life uses of man and to secure the requirements of plant and animal life, agricultural, mining and industrial purposes (52).

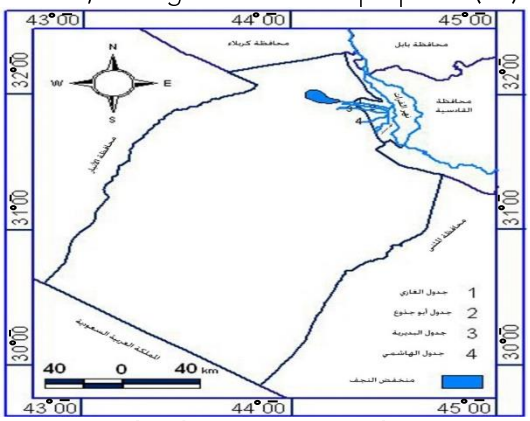

Figure (2) of surface water in Najaf Governorate

Source: Ministry of Water Resources, Directorate of Water Resources in Najaf Governorate, Department of Water Significances, unpublished data, look at Ahmed Yahya Abd's master's thesis, Using Geographic Information System to Study the Spatial Variation of Natural Resources in the Western Plateau in Najaf Governorate, College of Arts, University of Kufa, 2008 (53).

Shatt Al Kufa

The Euphrates River (Shatt al-Hindiya) enters the Kufa district, as it reaches a length of about (75,200 km) in the province of Najaf, and is called by the names of the cities that it runs through. The beginning of its entry into the district of Kufa to its last point in the province, a creek and a secondary river.

Shatt al-Abbasiya:

Shatt al-Abbasiya enters al-Abbasiya sub-district and al-Hurriyah sub-district, and branches from Shatt al-Abbasiya from the beginning of its entry into al-Abbasiyyah sub-district to the last point (al-Hurriya sub-district) a group of streams and secondary rivers amounting to (23) streams and sub-rivers.

underground water

Groundwater is that water that is below the surface level of the earth and occupies all or some of the voids in the rock formations, and it is originally part of the rain water, river water, or water resulting from the melting of ice. It is represented by artesian wells and water springs, which vary in depth from one region to another. As for the governorate, groundwater is frequently used in the western plateau region, due to the lack of rain and its seasonality and the absence of a source of surface water in the region. It is made of sand, gravel, sand rocks and mud, with good permeability, which facilitates the movement of water through it (54).

It relies on groundwater to irrigate agricultural areas in arid and semi-arid regions on the grounds that it is a second source of irrigation. It is distributed in Najaf Governorate in three regions (15):

The first area: It is located in the area that extends between the cities of Najaf - Karbala, and groundwater is present in it in two layers:

The first layer: water depths range between (15-60) meters, productivity rates range from (5-15 liters / second), stable water levels within (7 meters) or more, and the total dissolved salts ranges between (2500-4500) mg / liter (55).

The second layer: the depths of the arbors range from (100-320 meters) and the rate of productivity is high, more than 15 liters / second, in which water flows automatically and the group of dissolved salts in it ranges between (3000-5000) mg / liter

The second region: It is located geographically within the Najaf Sea, and the depths of wells range between (25-200 meters) on the eastern side, where water flows and productivity rates range between (10-35 liters / second) and the total dissolved salts range between (2000-4000 mg / liter).

The third region: It is represented in the Western Desert, where the depths of the wells range between (120-250 meters), and their productivity is estimated between 4-10 liters / second, and a part of the dissolved salts was recorded in it, ranging between (2500-4500 mg / liter) (16)

Groundwater, being one of the natural resources, affects the preservation of development projects through the possibility of a rise in the groundwater level to a certain level with which the types of rocks can be saturated with water, which leads to an enlargement of the size of the rocks and their fragmentation, and this naturally affects negatively the establishment of development projects, especially the establishment of facilities, including facilities buildings and roads,

The possibility of exploiting these areas to dig wells and provide water will revitalize the area and revive

its abandoned lands and make it suitable for cultivation and the establishment of economic projects in it and the settlement of nomadic Bedouins and the establishment of large natural pastures and provide a source of water to attract the population to it and encourage the thinking of establishing artificial lakes that can be invested in different aspects after providing services. Which attracts the population to it and provides the requirements it needs, as the groundwater in the region is currently not exploited except for agricultural use, as it is possible to invest it in the tourism aspect, especially with the availability of good chemical properties that it enjoys instead of the beauty of the region and the open environment of the horizons of the desert and the large number of springs with Standard specifications and successful characteristics and their investment in the establishment of medical tourism resorts.

Studies show that most of the springs in the region are either idle or have a limited flow so that the water does not exceed the mouth of the spring. And it prevented its flow from the springs, and also because of the neglect that these springs were exposed to, as it requires follow-up irrigation of their openings from air and water sediments.

In summary, water resources are considered as one of the natural resources in the province, the focus on which the economic and social development activities depend. It is represented by the Euphrates River that passes through the region and is in the form of two branches (Shatt al-Abbasiya and Shatt al-Kufa). It also contains a number of wells and springs spread in the western plateau region, as well as some marshes represented by Bahr Ibn Najm and a number of small marshes spread south of Najaf in the areas of Bahr al-Najaf and Abu Sakhir However, these sites are not currently exploited and lack the necessary services for them, to form an attraction factor and to contribute to finding a kind of water services, recreational or therapeutic, which depend on the presence of water. Among other aspects in which water is indispensable, water is an essential element in industry and in the irrigation of plants and agricultural crops, parks and gardens. Water and other uses Most activities (such as agriculture, energy, industry, and mining) affect not only the quantity of water resources, but also their quality, and thus lead to a reduction in the availability of water. Allocation of limited water resources among competing sectors and environmental needs for water becomes an increasing challenge. This further exacerbates environmental pressures.

Although water resources are renewable resources, the water reserve of groundwater is constantly decreasing, which may threaten the environmental balance, especially since there is no clear picture of the extent of the risk of disturbing this balance (17)

Third: mineral resources

Mineral resources throughout the ages represent an important source in supplying man with what he needs of the raw and necessary materials, and because of the importance of mineral resources and their impact on the course of human civilizations, some eras were named after them, such as the modern and ancient stone ages, the bronze age, and the iron age, which is believed to extend to the present time. Mineral resources constitute the basics of the current industrial era and the mainstay of human civilization at the present time until it has become the cornerstone of the planning and development processes, and minerals are included as a basic material in most industries such as the manufacture of cars, trains, planes, ships and household utensils, and no modern industry can be established without the availability of energy sources and deposits Mineral deposits in the province of Najaf are linked to the nature of its geological framework. The investigation and excavation operations have achieved the discovery of many of these deposits or the monitoring of evidence from them. The possibilities remain in making other discoveries. Here is a presentation of some minerals and industrial rocks discovered in the province of Najaf (18) Fig. 4:

Limestone

It is one of the sedimentary rocks that were formed in marine conditions, and the western plateau in Iraq is rich in limestone rocks, as it is present in the form of many sedimentary layers exposed on or near the surface, so it can be obtained in the form of open mines. The region contains important reserves of limestone, which mainly go back to the Euphrates and Dammam formations, and represent about (18)% of the total reserves of Iraq, and there are good possibilities to find new reserves of them (19)

The uses of these rocks and their importance are wide, as they are included in the cement industry, where the rocks of the Euphrates Formation near the city of Najaf are currently being extracted (the Kufa cement plant quarry in the Oyoun al-Shujeej area). On limestone rocks for use in internal construction and facades, some of them are suitable as substitutes for marble and have appropriate physical specifications in terms of color, hardness and porosity. It is broken and classified into different sizes, and hard layers are often used for this purpose. Limestone is invested for the purposes of crushing and arbitration from the regions of Shabaka, Al-Khamsat, Al-Rahimat, and the Southern Salt Valley. soil,

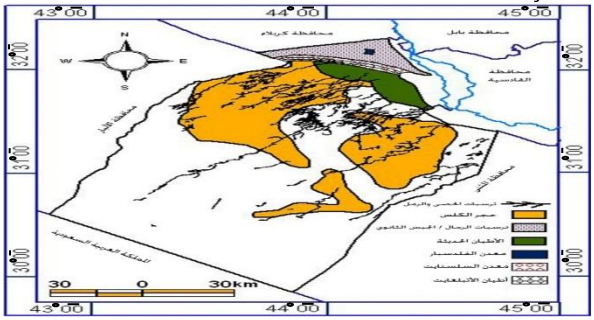

Figure 4 Geographical distribution of mineral resources in Najaf Governorate

Source: Republic of Iraq, Ministry of Industry and Minerals, General Corporation for Minerals, General Directorate of Geological Survey and Mineral

Investigation, Najaf Economic Map, 1984. See Master's Thesis, Ahmed Yahya Abd, Using Geographic Information System to Study the Spatial Variation of Natural Resources in the Western Plateau in the Governorate Najaf, College of Arts, University of Kufa, 2008

Clays

Clay from an industrial point of view is a complex group of minerals that can be single or a mixture of different types in their crystalline and chemical composition and in the nature of their formation and conditions of their sedimentation.

Modern Clays

It generally consists of a mixture of several clay and non-clay minerals, the most important of which are calcite, dolomite (30-40)%, quartz (20-25)%, and clay minerals (30-35%), including kaolin, illite, chlorite, and palegorskite. Burial does not require a specific specification, while the clays of the brick industry must be suitable for that industry, and this is confirmed according to laboratory tests conducted by the General Company for Geological Survey and Mining

Atbelgaite clays

These muds are known locally as (Khawa mud) and are found in some areas of Tar Al-Najaf to the west of the city of Najaf in the form of lentils within successive layers of sandy and muddy rocks and in the lower part of Injanah formation. The thickness of the lenticular layers ranges between half a meter to one meter, and these can be distinguished The clays are in the field through their greasy texture and their color, which often ranges from bluish-green to gray. It has a fibrous crystalline structure, which gave it the property of absorbing impurities and trapping them in the fibrous channels with high efficiency compared to other types of clays that take the lamellar form in their crystallization (20).

Atbelsite clays are among the important industrial clays, as they are used in several fields, including

- Drilling fluids in oil wells in saline places as an alternative to bentonite clays.

High viscosity prevents the formation of gaps in the salt layers.

- Paraffin wax has a short color.
- Shortening sunflower oil as a substitute for shortening soil.
- Filtering vegetable and mineral oils.
- Filtering and absorbent materials in the polyester and rubber materials industry

Sand deposits

It is one of the raw materials of mechanical sedimentary origin due to wind and river sedimentation. The main components of this sand are quartz, pieces of gypsum and a percentage of clay. However, there are large areas of this semi-pure sand that can be extracted and marketed without treatment, sifting or washing. Sand is invested in the region for several purposes, including construction and the manufacture of lime bricks and thermostone. Sand is invested for construction purposes from the Najaf island region, and sand is invested for the purposes of manufacturing lime bricks and thermostone, through the factories of lime and thermostone in the area of Haswat al-Khoranq (21)

Sediments of gravel and sand

Gravel and sand deposits are limited in the province of Najaf and their reserves are few, and the most important areas of their presence (Wadi Al-Khamsat in Bahr Al-Najaf, deposits of Wadi Hasab Abu Sakhir - Al-Rahba, deposits of Al-Khoranq pebbles). Investment from these areas is by the method of open surface quarries (22).

secondary gypsum deposits

Secondary gypsum is present mixed with the soil and spread on the surface over large areas within the deposits of the Dibdibeh Formation, and is often covered with a thin outer layer of air deposits. Secondary gypsum for the purposes of gypsum industry from the areas of Al-Haydaria and Bahr Al-Najaf using the open surface quarry method. Although gypsum deposits in the region contain high levels of impurities, the gypsum produced has a popular market in Al-Najaf governorate. Gypsum deposits extracted from the Bahr Al-Najaf area are used in the cement industry, where they With clinker for the purpose of slowing hardening(23)

Celestite mineral

It is an important industrial mineral, as it is considered the main source of centrotium, and it is considered a heavy metal, with a specific weight of about (3.95). It is also believed that the mineral selenite was formed as a result of the transformational processes resulting from the deposition of salts present in the groundwater rising to the surface through the Euphrates fault.

Celestite is used in the following areas (24):

- Production of strontium compounds used in the manufacture of some organic compounds, the manufacture of medicines and aircraft landing marks.
- Dyes, rubber and plastic industry.
- Steel industry and purification of caustic soda.
- Silk industry and non-metallic grease.
- Heavy drilling fluids for oil wells as an alternative to brite.
- Manufacturing ceramics and optical tubes for television, computers, sonar and radar screens.

Feldspar

A group of the main minerals in the composition of the components of igneous rocks and their basic chemical formula is aluminum silicate associated with potassium (orthoclase mineral) or with sodium (albite mineral) or with calcium (anorthite mineral), it is sometimes colorless or present in different colors white, grey, yellow, red)

Feldspar is one of the mineral ores of industrial importance, due to its use in many industries, the most important of which are (25):

- Glass industry: Feldspar minerals are an important source of alumina in the glass industry. Alumina

works to increase the formability of molten glass, increase stability and chemical stability of the final product, and improve durability by increasing shock resistance and increasing viscosity.

• Ceramic and porcelain industry: The ceramic industry occupies the second rank among the feldspar-consuming industries. Feldspar is used in this field as a refractory agent to form the vitreous form by strengthening the glaze and transparency. It is used as a source of alkali and alumina in the manufacture of ceramic coatings.

Plastic, rubber and paint industry: fine feldspar granules are used as fillers and extensors in the paint, plastic and rubber industry, provided that the size of the granules used ranges from (20-30) microns. The importance of feldspar in this industry is due to the fact that it works to resist thermal stress and control thermal expansion (26)

Sulfur

Sulfur is one of the minerals with limited presence in Najaf Governorate. This mineral is found to the northwest of the village of Al-Rahima at the ruins of the Al-Ruhban Palace. The areas in which this element is found are known as sulfuric areas, and they are characterized by what is called (sinks) that emit an unpleasant smell as a result of the emission of binary gas Hydrogen sulfide, and sulfur has been invested since ancient times in this region, in limited quantities and in primitive ways, especially since the sulfur sites are close to the old pilgrimage route, and that sulfur is one of the odorous substances that are used in the treatment of skin diseases of camels and livestock, as well as human skin diseases (27),

Through the foregoing, we can conclude that the minerals throughout Iraq's governorates are diverse and with very huge reserves, which made Iraq occupy an advanced position in many of them in terms of natural resources in the world. The importance of minerals cannot be denied, as it has entered into many important things, including the manufacture of cars, electronics, and buildings. Which needs solid materials, iron rods, and other uses that we can never abandon, whatever happens, and the discovery of minerals of all kinds causes a remarkable development that we can never deny, whatever happens, and it cannot also be ignored by humans in all fields around them.

The mineral resources in the region depend on the nature of the rock components of the geological formations and the natural factors affecting them.

Although the mineral deposits in the province are limited in variety, they are economically important as a source of wealth and raw materials that contribute to the development of the Iraqi industry as well as their contribution to the development of the economic growth of the province of Najaf.

Second: The possibilities available for investing in non-living natural resources in Najaf Governorate

Investment is the exploitation of available resources, and setting expectations and a future plan to increase and benefit from them.

That is, managing the available natural resources and developing them optimally, sustaining those resources, and carrying out productive projects that would meet the needs of local and regional demand and benefit the investors (38).

The diversity of natural resources in the province of Najaf made it the focus of attention of investors, as its vast area and distinguished location give it additional importance that could draw future attention to it to invest the natural resources in it, in addition to the existence of a future developmental need for the region as it is a good factor for investment, and through studies of the region It turns out that it has many advantages that make it an investment attraction, including:

1. Availability of water resources
2. Availability of suitable soil and land
3. Availability of mineral resources

The lands of Najaf governorate are among the lands that enjoy fertile soil that helps in securing the necessary food for its residents and neighboring areas, in addition to its possibility to settle many development projects, whether those directed towards local consumption or those directed towards export, ,. As well as the presence of vast areas of agricultural land in the region and the provision of large storages of water suitable for irrigation, whether its sources are from groundwater or from streams that cut through the lands of the region, all of this necessitates those interested in establishing investment projects where agricultural ingredients are available in the region, and fertile soils and abundant water are considered An important incentive in the establishment of an area of social benefit and then attracting the largest possible number of residents where there is a source of livelihood, and in view of the area's fertile land and permanent surface water resources represented by river streams branching from the Euphrates River, and other surface water can be exploited for various agricultural purposes. 39).

3. Results

1- It turns out that there are many raw materials, and these resources are included in many industries, and among these industries are the extractive industries (gravel and sand factories) and the manufacturing industries (gypsum and bricks) that depend on the natural resources available in the region, and which are involved in the building and construction process, as well as the establishment of Other industries, given the availability of these natural resources,

2- As for the types of gypsum soils, silty clay soils and existing clays, they are included in the plaster industry for the first type and in the brick industry for the second type. These materials are used in the building and construction process and are marketed to different areas within and outside the province of Najaf.

3- The governorate is also distinguished by its possession of mineral wealth that can be invested in industrial and productive projects, especially the cement industry, the glass and ceramics industry,

and the brick, thermostone and lime industries, due to the availability of natural resources (raw materials) for these industries represented by gravel, sand, limestone, feldspar and clays represented by Palliurskyite and zeolite clays, which are present in high proportions. It is high in the Bahr Al-Najaf area near Al-Tar area, which helped these minerals and raw materials in the development of many industries.

4- Adoption of the governorate and the neighboring governorates with their needs of al-Nourah, the main material for the manufacture of lime and thermostone bricks, in that the governorate has the ability to develop these industries and establish new construction industries that meet the growing market needs. The abundance of raw materials that are sufficient for investment, as well as the abundance of manpower and scientific competencies capable of Project management, development, operation and development.

5- The area and location of the province gives it great importance in terms of future potentials for investing in the natural resources available in it, as well as the future need for many products that come from those natural resources, which is an encouraging factor for various investment operations.

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