

Blacksmith factories and workshops in the Al-Jihad neighborhood, southwest of Baghdad, and their impact on pollution

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المخلص

تؤثر مصانع وورش الحدادة في منطقة الدراسة تأثيرًا كبيرًا على البيئة من حيث التلوث. تُعتبر هذه المصانع والورش من الحرف الصناعية ذات الأثر السلبي على البيئة داخل الأحياء السكنية. يلعب المناخ دورًا رئيسيًا في هذه المصانع والورش، حيث يُعد المطر والرطوبة من أكثر العوامل تأثيرًا على الحديد. بالنسبة للظروف المناخية، تتعدد العوامل التي ساهمت في وجود مصانع وورش الحدادة في منطقة الدراسة، ومن أهمها القوى العاملة، والسوق، والمواد الخام، ووسائل النقل، ومصادر الطاقة والوقود. وقد نتج عن هذه المصانع والورش العديد من المشكلات البيئية، لا سيما تلوث الهواء والترية، والتلوث البصري، والتلوث الضوضائي. يجب معالجة هذه المشكلات واختيار الموقع الأمثل لهذه الحرفة، بعيدًا عن الأحياء السكنية، مع مراعاة الجوانب البيئية للحفاظ على البيئة والحد من التلوث.

الكلمات المفتاحية: مصانع الحدادة - ورش العمل - حي الجهاد - جنوب غرب بغداد - التلوث

Abstract:

The blacksmith factories and workshops in the study area have a major impact on the environment in terms of pollution. Blacksmith factories and workshops are considered industrial crafts with a negative impact on the environment within residential neighborhoods. The climate has a major role on the blacksmith factories and workshops, and the elements that most influence iron are rain and humidity.

Relativity, and the blacksmith factories and workshops have several components that helped their presence in the study area. The most important of these human components are the workforce, the market, the raw materials, means of transportation, energy and fuel sources. The blacksmith factories and workshops have resulted in several environmental problems, namely air pollution and soil pollution, sight pollution, noise pollution, these problems must be addressed and the most appropriate and optimal place for this craft must be chosen, away from residential neighborhoods, and the environmental aspect must be taken into account in order to preserve the environment and reduce the amount of pollution.

Keywords : Blacksmith - factories - workshops - Al-Jihad neighborhood - southwest of Baghdad, - pollution

Introduction:

Industrial activity constitutes the most important economic activity in the economies of countries in which the elements for the establishment and development of that activity are available on the one hand, and the investments of those elements in establishing the activity are estimated on the other hand. The phenomenon of industrial crafts has received growing attention in geographical studies, and this study (blacksmith factories and workshops in... The Al-Jihad neighborhood area, southwest of Baghdad, and its impact on pollution. As a result of urban expansion in the study area and the increase in its population, this craft has become undesirable as it is a craft that pollutes the environment and its presence within residential neighborhoods is inappropriate.

Research problem:

The research problem is defined by the following two questions:

- 1- Do the blacksmith factories and workshops currently in the Al-Jihad neighborhood have the ingredients for success?

- 2- Do these components provide an opportunity to establish a new craft or expand existing ones?

Research hypothesis:

The blacksmith factories and workshops in the study area provide a service to the residents of the Al-Jihad neighborhood, and the constant changing demand in the building and construction movement in the Al-Jihad neighborhood area has made the blacksmith factories and workshops a necessity that the region needs, due to the presence of new neighborhoods that are still in the building and construction stage, and the nature of this craft has begun to expand. In the study area, it is not possible to establish another craft next to it, otherwise the study area will turn from a residential neighborhood into an industrial neighborhood.

Research aims:

The research aims to identify the natural and human components and environmental problems resulting from blacksmith factories and workshops in the study area, as well as to reveal the impact of blacksmith factories and workshops on environmental pollution and providing appropriate recommendations in order to preserve the environment from pollution.

Research Methodology:

The study relied on the descriptive analytical method in collecting data on both sides of the research:

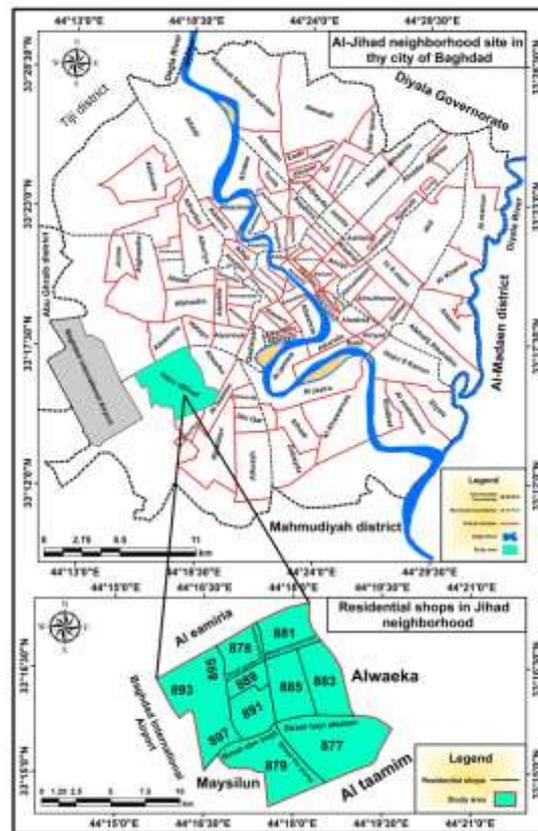
- 1- Collecting sources from libraries, including books, theses, and university dissertations.
- 2- Review the official government office
 - A. Ministry of Transport - General Authority for Meteorology and Seismic Monitoring, Climate Section, in order to obtain data related to the region.
 - B. Ministry of Transport, General Authority for Survey, Map Production Department.
 - C. Ministry of Industry and Minerals, General Company for Geological Survey and Mining.
 - D. Baghdad Governorate, Al-Rashid Municipality Department, Al-Jihad District Municipality Center, Geographical Information Preparation Division.
- 3- Conducting a field study that compensated for the lack of data and information through a questionnaire form as well as photographs in order to obtain the correct information, as well as adopting the percentage method.
- 4- Data processing and output in the Arc map 10.4.1 program.

1-1: Natural features of the study area:

1-1-1: Geographical location

The study area for Baghdad Governorate is located in the southwestern part of the capital, Baghdad, between two longitudes (44.15.00, 44.21.00) and two latitudes (33.15.00, 33.16.00) (1), and it is one of the areas of Baghdad that falls within the boundaries of the municipality of Al-Rashid. The area of the study area is (17.58834) km², and the study area is considered one of the important areas because it is close to and adjacent to Baghdad International Airport, as it is bordered to the north by the Al-Amriya area, to the east by the Al-Warka area (Al-Amel neighborhood), and to the south-east by the Al-Tamim (Al-Bayaa) area. To the southeast is the Maysalun area, and to the east is Baghdad International Airport (2), as shown in map (1).

Map (1) Location of the study area in relation to Baghdad Governorate

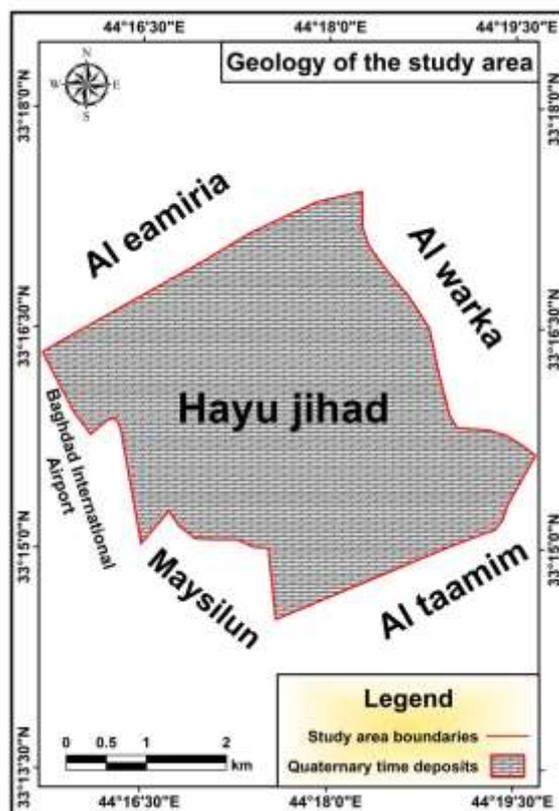


Source: The work of the researcher based on the data of the General Authority for Survey, the map of Baghdad Governorate for the year 2018 AD, and the satellite visualization issued by the Information Division, Al-Rashid Municipality Department, Al-Jihad District Municipality Center, for the year 2017, and processed in the Arc map 10.4.1 program.

1-1-2: Geology of the study area

The geology of the study area dates back to the fourth geological time. This era began (2 million years ago) and is still continuing until now (3). The sediments of this period are important from an economic standpoint, as they are the source of gravel, sand, and clay. In most cases, they are the direct source of agricultural soil. It is a source of many subsurface water bodies (4). The sediments of the study area are mostly fine clayey sandy deposits whose thickness does not exceed a few meters. Some of the soils of the study area are covered with crystals of secondary gypsum and salt. As shown in map (2)

Map (2) Geology of the study area



Source: The work of the researcher based on the data of the General Authority for Survey, the map of Baghdad Governorate for the year 2018 AD, and the satellite visualization issued by the Information Division, Al-Rashid Municipality Department, Al-Jihad District Municipality Center, for the year 2017, and processed in the Arc map 10.4.1 program.

1-1-2: Climatic elements:

1-1-2-1: Rain

Rainfall in the study area is characterized by its small amounts, as the total annual rainfall at the Baghdad station reached (134.2) mm. The rainy season begins from the month of October, reaching (14.3) mm, and then gradually diminishes in the month of May, reaching (4.6) mm. When the period from June to September remains completely dry, the effect of rain on the iron is that the iron oxidizes and changes its color from black to orange or yellow, which leads to the formation of “rust” on the iron, known as “grinding.” (5) As shown in Table and Figure (1)

Table (1) Monthly rainfall amount (mm) for Baghdad station for the period from (2005-2020 AD)

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Baghdad Station	20.3	15.4	20.4	12.8	4.6	0.0	0.0	0.0	0.1	14.3	28.5	17.8	134.2

Source: Ministry of Transport - General Authority for Meteorology and Seismic Monitoring, Climate Department, data (unpublished), 2021 AD.

Figure (1) Monthly rainfall amount (mm) for Baghdad station for the period from (2005-2020 AD)



Source: From the researcher's work based on data from Table (1)

1-1-2-2 Relative humidity (%)

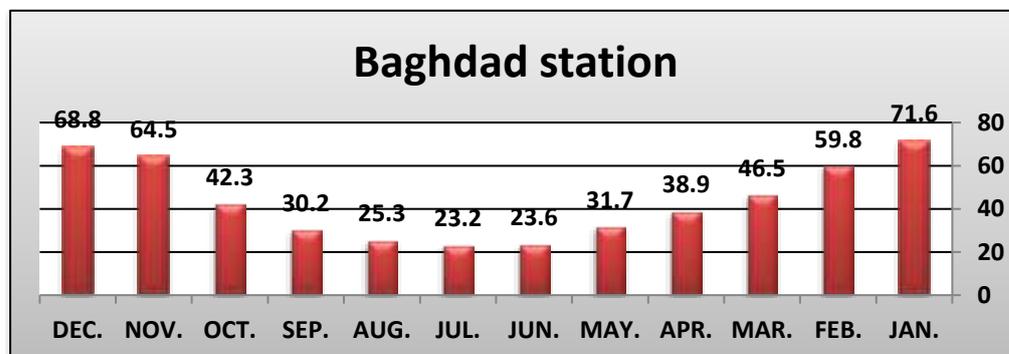
The relative humidity in the air is of great importance, as it has a significant impact on iron, as the relative humidity begins to rise gradually from the month of September, reaching (30.2%), then it reaches its highest percentage in the months (October, November, December, January, (February, March, April, May) reaching (42.3, 64.5, 68.8, 71.6, 59.8, 46.5, 38.9, 31.7%), as iron changes its physical properties, oxidizes and changes color, so the iron is coated with radialite and comes in two colors (red, The color is lead, in order to protect the iron from rust, and also prolong the life of the iron. It is coated with radialite before and after shaping it into the desired shape and model. (6) As shown in Table and Figure (2).

Table (2) Monthly averages of relative humidity (%) in Baghdad station for the period from (2005-2020 AD)

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Baghdad Station	71.6	59.8	46.5	38.9	31.7	23.6	23.2	25.3	30.2	42.3	64.5	68.8	526.4

Source: Ministry of Transport - General Authority for Meteorology and Seismic Monitoring, Climate Department, data (unpublished), 2021 AD.

Figure (2) Monthly rates of relative humidity (%) at Baghdad station for the period from (2005-2020 AD)



Source:
From
the

researcher's work based on data from Table (2)

1-2 surface

The surface forms part of the alluvial plain, which is characterized by its flat land and lack of heights, which led to the spread of blacksmithing factories and workshops in the study area, and the large demand for it led to the attraction of this craft, its spread, and its concentration in Ibn Aqeel Street in the study area, (6) Also, the city of Baghdad is located in Two linear elevations (30-38 m) above sea level. (7)

1-3 soil

Soil is defined as a natural formation in continuous development. It was created by nature through physical (mechanical), chemical, and biological processes between the lithosphere and the living space of plants and animals. (8) It covers all or most of the surface of the Earth (land) with a thickness ranging from a few centimeters to several meters. It is also considered a natural formation in continuous development. Soil is an important medium for the growth of plants and other uses. (9) The study area contains the finest types of soil suitable for agricultural production, as it was previously an agricultural area and then turned over time into a residential area. Blacksmith factories and workshops are spread randomly, and most of the factories and workshops are slums. (Transgressors), and this craft has a significant impact on the soil because its solid waste is difficult to decompose and thus leads to soil deterioration. (10)

2-2 Human and economic components of the study area:

2-2-1 Manpower

The availability of manpower is one of the most important factors that help the success of the industry and its development. However, it is possible for manpower to migrate from one region to another if wages are high and attractive. (11) Skilled and unskilled workers are present everywhere, as unskilled workers come in the first place. From rural areas, while skilled workers are concentrated inside the city, (12) and the number of workers varies in the blacksmith factories and workshops in the study area, as well as the difference in their daily wages. The worker receives (35,000) Iraqi dinars. This is for a medium-skilled worker, while the skilled worker receives (45,000) Iraqi dinars. As for the usta, he receives (75,000) Iraqi dinars, noting that most of the workers are not good at reading and writing. They learned this craft from the usta and opened their own factories for them. (6) As shown in Table (3)

Table (3) Factor, number of workers and their percentage

Laboratory Name	Number of Workers	Thire Percentage
Engineer's blacksmith factory	6	11.5%
Hammurabi's blacksmith factory	7	13.4%
Hammurabi's 2 blacksmith factory	4	7.6%
Almufid blacksmith factory	3	5.7%
Al-Buraq blacksmith factory	2	3.8%
Modern building engineering blacksmith factory	6	11.5%
Al-Yaqin blacksmith factory	4	7.6%
Baghdad blacksmith factory	6	11.5%
The brother's blacksmith factory	4	7.6%
Al Rams PVC blacksmith factory	4	7.6%
Nour Al-Mustafa blacksmith factory	3	5.7%
Abo Haidar blacksmith factory	0	0%
Blacksmith factory, may God bless you	3	5.7%

Total	52	100%
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Source: From the researcher's work based on the field study dated 26/11/2020

2-2-2 Market

Marketing includes operations and services related to the transformation of goods or transferring their ownership from the producer to the consumer. Therefore, the market will contribute to the overall economic, agricultural, and industrial life. (13) If the raw material is of the type that increases in weight and size during the production process, the industry settles near the market. (13) 14) The blacksmith factories and workshops in the study area dispose of their products in the internal market due to the large demand for them due to the presence of residential neighborhoods that are still in the building and construction stage. Also, the blacksmith factories and workshops need warehouses to store the product, but they lack the presence of these warehouses and they exploit foreign lands. It is allocated for the purpose of storing the product and the production is according to the customer's request. This type of industry increases its size and weight. (6)

2-2-3 Primary Article

These are the materials from which various human needs are made. They may be in the form of agricultural, animal, vegetable, mineral, or industrial raw materials (15) as the raw material used in the blacksmith factories and workshops is very close to the study area, as it comes from the industrial district of the Bayaa area. Iron also has the advantage of being easily transported from the market to factories and workshops in order to obtain a variety in the required form. As for the types of iron used in blacksmithing work, they are as follows: iron (Iraqi, Ukrainian, unengraved Turkish, engraved Turkish). However, after 2003 AD, the demand for imported iron increased due to the openness of the market went abroad, the demand for Iraqi iron

decreased, and its prices fell in the internal markets. (6) As shown in Figure (1-2)



unpatterned Turkish iron

Pic. (1)

**iron.
of**



**of
engraved
Turkish
Picture (2)**

Captured on 11/16/2020

2-2-4 Means of transportation

Ways, means, methods, and planning procedures that aim to transport people and their production from one place to another, at the lowest possible cost. (15) The type of transportation in the study area is internal, and it works to transport its products to internal markets, as well as transport workers by car, because its wages are low due to its proximity to the market. The main source of raw material is located in the industrial district, Al-Bayaa area. As for the types of cars used to transport the raw material and the product, they are (Kia Banco, with a capacity of 3 tons), a Mercedes, with a capacity of 8 tons, and a pickup truck, with a capacity of 1 ton. (6)

2-2-5 Capital

Industries need expensive machinery and equipment, in addition to raw materials, energy sources, labor, land ownership, and rent, all of which require the availability of sufficient capital. (16) When the factory was established, the capital reached more than (50) million Iraqi dinars in 2016 AD, and it is affiliated with the sector. private . (6)

2-2-6 Energy and fuel sources

Fuel is any material that generates fire when burned, such as wood, coal, oil, and natural gas. Energy is the power inherent in any material to perform the work of the energy used in industry in the form of heat, a driving nucleus, or a driving force. Some industries use energy to generate heat to melt metals, (17) As the blacksmith factories and workshops in the study area increased after 2003 AD due to the increased demand for the product as a result of the increase in the region's population and residential expansion, and the energy source in these factories and workshops depends on national electricity, but in the event of an outage, it depends on both types of generators (gasoline - Gasoline) in order to generate electrical energy and carry out their work. (6)

3-1 Problems resulting from blacksmithing factories and workshops in the study area

There are several problems resulting from the blacksmith factories and workshops in the study area, including social and environmental problems. The social problem is that some factories employ young people and juveniles in the factories, and this profession is considered one of the dangerous professions that is not appropriate for their ages, and his preoccupation with work leads to him not attending school, and thus It will affect the social level and the spread of illiteracy, or it may be another reason for him not attending school because he is the sole support for his family. As for the environmental problem, it is the most important problem, which is the pollution resulting from the blacksmith factories and workshops in the study area. There are several types of pollution, which are as follows: -

3-1-1 Air pollution

It is the presence of foreign bodies in the natural composition of the air that may be suspended, floating, or carried between its molecules. These bodies differ in quality and nature according to their sources and differ in their accumulation according to their concentration in the air. Industry is considered a primary pollutant in the air because of the by-products it produces as waste that accompanies the production process. In industry, it is Pollutants result from two sources:

E. Gases and particles resulting from the combustion process

F. Minutes resulting from automated processes during manufacturing. (18)

Air pollution in the study area results from welding operations, which cause carbon dioxide gas to be released, as well as compressor painting operations, which cause paint particles to fly into the air. It has an impact on humans, causing asthma, allergies, bronchitis, and nose, throat, and eye diseases. (6)

3-1-2 Soil pollution

The soil is polluted with many compounds foreign to its mineral and organic components that reach it from irrigation water, wind, or dissolved in rainwater and in the form of particles, pesticides, herbal pesticides, or industrial, gaseous, and radioactive waste. Among the most important pollutants in the soil are solid wastes, and solid wastes are known as any solid substance. Or semi-solid materials that are thrown away by humans to determine what is needed and cannot be used, and they contain materials that are easily degradable or non-degradable, which pose harm to the air, water in the soil, and public health, despite the possibility of benefiting from these discarded materials elsewhere by recycling them, (18) and that the area The study suffers from the presence of solid and semi-solid materials, pollutants resulting from food remains, which are biodegradable, and non-biodegradable pollutants, such as iron residues, which lead to soil deterioration and the spread of the phenomenon of desertification. The accumulation of food remains (waste) leads to the spread of stray cats and dogs, rodents, flies, mosquitoes, and unpleasant odors, which It caused the spread of diseases in the study area. (6) As shown in picture (3)

Pic. (3): Pollution in the study area resulting from waste and blacksmithing factories

and workshops



Captured on 11/26/2020

3-1-3 Visual pollution

It is a distortion of a scene that the human eye encounters. When looking at it, one feels psychological discomfort. It can also be described as a type of taste, the disappearance of the beautiful image of everything that surrounds us from the environment. (18) The study area contains this type of pollution because it is located in areas Residential and distorts the view of residential areas. (6) As shown in Figure (4)

Image (4): Visual



pollution in the study area

Captured on 11/26/2020

3-1-4 Noise pollution

Noise is a group of unwanted sounds that affect the sense of hearing when their frequencies are higher than (70 decibels). The noise comes from different sources and affects the person hearing directly. Its percentage increases if it enters closed spaces due to sound reflections from the walls and ceilings of neighboring buildings. For the source of the sound, (18) and that the study area contains this type of pollution issued by blacksmith factories and workshops, and the source of these sounds is issued by the process of hammering iron, hacksaws, cutters, and drills, which in turn affects the sense of hearing inside the factory and the residential neighborhoods close to the factory, and they feel uncomfortable and lack of concentration. And headaches and nervous conditions, in addition to the sounds of generators, and this type of noise is considered permanent. As for the second type of noise, which is temporary, resulting from the building and construction processes of homes and their use of construction equipment and machinery that emit loud sounds, as well as the voices of street vendors, in addition to the noise of cars and their use of cars horns cars. Also, the study area is close to Baghdad International Airport, so the noise that comes from aircraft taking off and landing on the runway causes noise, as the study area suffers from noise pollution. (6)

Conclusions

After reviewing what was reported in the research according to the theoretical and field studies of the study area, the researcher arrived at a number of the following results and facts:

- 1- The blacksmith factories and workshops settled in the Al-Jihad neighborhood had factors behind them that contributed to their settlement, and the most important of these factors is the market that fulfills the desires of consumers and is close to the consumer, in addition to the personal desire that prompted the owners of the factories and workshops and their presence in the current areas in terms of their proximity to their area of residence. .
- 2- The blacksmith factories and workshops in the Al-Jihad neighborhood suffer from constant power outages, and the machines and machinery used for blacksmithing purposes are old and draw high electrical current.
- 3- Most of the blacksmithing factories and workshops in the Al-Jihad neighborhood do not conform to the required specifications and there is no continuous continuity in them.
- 4- The presence of young workers in blacksmith factories and workshops under the legal working age.
- 5- The blacksmith factories and workshops in Al-Jihad neighborhood are considered environmentally polluting in terms of air, soil, noise, and visual pollution.
- 6- The blacksmithing factories and workshops in the Al-Jihad neighborhood are not appropriately located, as they are within residential neighborhoods, and it is preferable to move them to their designated places.

Recommendations

- 1- It is preferable that the blacksmithing factories and workshops established in the Al-Jihad neighborhood be moved either to the industrial neighborhood in the Al-Bayaa area or the Fourth Police District.
- 2- It is preferable to use renewable energy, which is solar energy, in the event of a power outage, instead of generators that operate on fuel, which pollutes the environment.
- 3- Do not employ young children in blacksmith factories and workshops, as they are dangerous crafts and not suitable for their age.
- 4- It is preferable to recycle waste, as well as iron waste, and benefit from it and preserve the environment.
- 5- There should be governmental control over blacksmithing factories and workshops in terms of exceeding the national electricity requirement, maintaining the factories and workshops, as well as following up on safety conditions.

Reference:

- (1) Ministry of Transport, General Authority for Survey, Map Production Department, Administrative Map of Baghdad Governorate, unpublished data, 2018 AD.
- (2) Baghdad Governorate, Al-Rashid Municipality District, Al-Jihad District Municipality Center, Geographical Information Preparation Division, unpublished data, 2017 AD.
- (3) Tahani Misbah Nabhan, Earth Sciences, Dar Safaa for Publishing and Distribution, Amman, 1st edition, 2008, p. 161.
- (4) Abdullah Al-Sayyab, Farouk Sanallah Al-Omari and others, Geology of Iraq, Ministry of Higher Education and Scientific Research, printed by Dar Al-Hikma Press for Printing and Publishing, University of Mosul, Mosul, 1st edition, 1982 AD, p. 175.
- (5) Researcher, relying on data from the Ministry of Transport - General Authority for Meteorology and Seismic Monitoring, Climate Department, data (unpublished), 2021 AD.
- (6) The researcher, based on the field study, dated 27-26-16/11/2020 AD.
- (7) Khawla Ghareeb Faraj Al-Maliki, Urban Distribution and its Impact on Changing Agricultural Land Use in the City of Baghdad, PhD thesis (unpublished), University of Baghdad, College of Arts, 2011, p. 36.
- (8) Ali Hussein Al-Shalash, Soil Geography, University of Baghdad, Baghdad, 1985, p. 7.
- (9) Ibrahim Sharif, Soil Composition, Distribution of Its Types, and Maintenance, Alexandria University, University Culture Foundation, 1960, p. 11.
- (10) The researcher, based on the field study, conducted a personal interview with Mr. Ahmed Mahmoud Ahmed, an engineer at the General Authority for Survey, one of those responsible for establishing and surveying the study area, on 11/27/2018 AD.
- (11) Hashem Muhammad Saleh, Geography of Industry, Arab Society Publishing Library, Amman, 2013, p. 46.
- (12) Qasim Shaker Mahmoud Al-Falahi, Industry in Karbala Governorate (a study in the geography of industry), Master's thesis (unpublished), University of Baghdad, College of Arts, 1989 AD, p. 141.
- (13) Ali Mikhlif Saba', Land Uses in the Al-Ishaqi Project, Master's Thesis (unpublished), University of Baghdad, College of Arts, 1997, p. 202.
- (14) Muhammad Azhar Al-Sammak, The Geography of Industry in a Contemporary Perspective, Al-Yazouri Scientific House, Jordan, 2011, p. 107.
- (15) Ahmed Habib Rasoul, Geography of Industry, Arab Renaissance House, Beirut, 1985, pp. 22-53.
- (16) (16) Ali Ahmed Haroun, Geography of Industry, Dar Al-Fikr Al-Arabi, Cairo, 2011, p. 60.

- (17) Noura Zayed Ati, The reality of construction industries (manufacture of tiles, insulating materials, and concrete products) in the city of Baghdad, Master's thesis (unpublished), University of Baghdad, College of Arts, 2011, p. 51.
- Salam Fadel Ali, Environment and Pollution, Foundations and Principles, Dar Al-Kutub and Documents (National Library), Baghdad, 2013 AD, pp. 43-76-83