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Analysis of The Geographic Distribution of the Population of Baghdad

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Abstract

Baghdad is considered the largest city in Iraq, with a population of approximately nine million people, according to the 2022 statistics. Due to this population increase, the city of Baghdad has experienced horizontal expansion rather than vertical expansion, resulting in a shortage of basic services, an increase in population migration, and a rise in prices. Therefore, our research focuses on shedding light on the patterns of population concentrations in the city of Baghdad and the nature of population distribution within it. We addressed the topic from various angles, starting with the population distribution among the city's districts and their density. Additionally, we explored the factors influencing population density in the province of Baghdad. As population density tends to increase in the city center, especially in old cities like Baghdad, our study on population density relied on a gradient from the center of the province to its outskirts.

Keywords: *Density, Population, Baghdad, Natural Factors, Human Factors.*

Introduction

The major cities are considered important centers for attracting populations to a greater extent than other smaller cities and villages, leading to a significant increase in population density due to the accumulated congestion within the city's specified area. Due to the change that occurred in the form of investment per unit area within cities, the city became unable to maintain its major features designed for it.

Baghdad has witnessed significant changes in land use, shifts in population densities, and a renewal of investment formulas used by urban entities, complicating the urban organization of the city. Each change has become a problem, as the city undergoes random and disorganized population growth and migration, conflicting with the city's fundamental plans, creating chaos and confusion within the city.

The importance of our research lies in the possibility of obtaining research results that illustrate methods and approaches that can be used to address the population distribution imbalance within the city of Baghdad and its districts. We aim to provide suggestions that can benefit urban planning and decision-makers to offer suitable solutions for the population distribution imbalance within and outside the city.

The study of population density is one of the most important studies, and the main problem in our research revolves around answering the following questions:

1. How is the population of Baghdad distributed inside and outside the city? What is the strength of the population in the city?
2. What is the difference in population strength between population areas inside and outside the city of Baghdad?
3. What is the gradient of population and housing densities based on distance from the center of Baghdad?

The objectives of our research are to show the population density within the city of Baghdad, and the difference

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in density between the areas affiliated with the city. The research also aims to find out the reasons for the gradient in population density between the city and its outskirts and to show the factors influencing this gradient.

The Development of Population Growth in The City of Baghdad.

The city of Baghdad is one of the most important and oldest Iraqi cities, and its growth and prosperity were rapid and significant in all respects, according to the circumstances of each stage that the city passes through, which imposes on the city the givens of this stage.

We note that population growth in the city of Baghdad has begun to increase since 1947, and this became clear after conducting an official census of the population in Iraq, through which it was revealed that the population of the city of Baghdad has exceeded half a million, as shown in Table No. (1). The population concentration in the city was only within a small area of land that did not exceed the boundaries of the old municipality, which included Adhamiya, Al-Karkh, Al-Rusafa, and Al-Kadhimiya. These areas had a high population density compared to the rest of the city's areas, where the density did not exceed fifty people per dunam, except for the two areas. Al-Arsat and Tal Muhammad, which are considered crowded residential areas.

In 1957, new neighborhoods appeared outside the old borders of the city, such as New Baghdad, Al-Mansour, Al-Mamoun, and Al-Hurriyah. The old neighborhoods maintained a high population density, along with the residents of Al-Saraif in the areas surrounding the city, represented by Tal Muhammad and Bzayer Al-Sulaikh on the eastern side of the city, and the Al-Washash and Al-Shakriya neighborhoods on the western side. The area was the city of Baghdad until the end of the 1950s covered about 850 square kilometers (Al-Ashaab, 1982: p. 64).

The population increased clearly during the 1970s and 1980s, and this increase was evident in the new, developed areas. As for the old areas, the population density decreased noticeably and gradually. The population density began to decrease further we moved away from the city center, where the advantageous commercial centers were located. The population density is less than 50 people per dunum, and the commercial area is surrounded by a dense population belt represented by old shops and old houses of small area, with the population density ranging between 100-300 people per dunam.

Population density increases after this range in the western regions of the city of Baghdad in the form of scattered concentrations in the neighborhoods of Al-Salam, Al-Hurriya, Al-Shu'la, Al-Kadhimiya, and Al-Washash, and in the eastern regions of the city, which are represented by the neighborhoods of New Baghdad and Al-Sadr or Al-Thawra. These neighborhoods were chosen to be the homes of moneylenders because they are far from the city center.

Table No. (1): The growth rate of the population of the city of Baghdad.

rate Growth	Number Population	Year
%7.6	515459	1947
%7.2	784763	1957
%6.5	1626230	1965
%5.1	2726818	1977
%4.8	3841268	1987
%4.7	4483500	1997
%4.6	5124422	2004
%4.4	5682081	2007
%4.1	8126755	2018
%3.6	9006001	2022

Source: Ministry of Planning. (2022). Central Bureau of Statistics, census results from 1947 to 2022, Baghdad Municipality.

This increase in population density was accompanied by government agencies working in the field of planning and implementation constructing large projects that benefit the citizens of the city of Baghdad and attract residents to the city, such as constructing residential buildings and modern buildings, opening roads, and expanding the green zone. The implementation of these projects led to the creation of high-density population concentrations. In most of the city's neighborhoods.

Variation in Population Density in Baghdad Governorate and the Factors Affecting it

There are many factors that affect the variation in population density in Baghdad Governorate, and the effect of these factors varies according to its place and time. These factors affect the shape of the place.

Map No. (1): Residential shops in Baghdad Governorate.



Source: Baghdad Municipality, Basic Design Department, Geographic Information Systems Division, Baghdad Municipalities Map

First: The Natural Factors

The natural factor is considered the most principal factor affecting population density. These factors are aspects of climate, surface, soil, and water resources. The strength of the influence of these natural factors varies depending on the place. With the advancement of science and the development of technology, man has been able to control these factors and significantly reduce their impact on population density. This is what happened in Baghdad Governorate. The most important natural factors that affect population density in Baghdad Governorate are:

Surface

Terrain is considered one of the most important natural factors affecting population variation and density, and this effect is clearly due to economic life, as there is a complex relationship linking terrain to population directly and indirectly (Zelinsky, W.A, 1970). The plains are considered one of the areas that most attract residents because they are suitable for human economic and agricultural activity in terms of plowing and watering the land and the ease of using agricultural machinery and laying roads to reach the lands, which facilitates the production process (Al-Shami, 1971:9). Baghdad Governorate is a flat plain area covered by the sediments of the Tigris and Euphrates rivers (Hamdan, 1957: 59). Therefore, we find that the effect of the surface on the population density in the city of Baghdad is small because the Baghdad area is plain and flat, so that the low-altitude areas have increased density and become high-density areas, while the areas surrounding central Baghdad are considered low-density areas, and this is due to the overlapping Many geographical factors, including the surface factor, had a lesser effect than other factors. The elevation of the area located in the southwest of the governorate pushed the population to move to lower elevation areas.

Climate

Climate is considered one of the most key factors affecting the distribution of population, directly or indirectly. Its direct impact is through its impact on humans, their effectiveness and activity, and its indirect impact is through the impact on the soil and cultivated plants and how to exploit them (Trewartha, 1969: P 82). Therefore, climate can be considered one of the factors causing the difference in population density between one region and another (Al-Hiti, 1976: p. 26). Our study area, Baghdad, is distinguished from other regions in that it is located in a flat land and has a climate different from that of its counterpart, as the Tigris River, which passes through it, is excluded because its effect does not go beyond being humid. One of the characteristics that the climate of the city of Baghdad has been that it is dry with Extreme extremes in temperature, where the desert climate is predominantly characterized by high continental temperatures and a wide difference in temperature ranges, annual and daily. The reason for this is Baghdad's distance from bodies of water, lack of vegetation, low humidity, clear skies, and Lack of clouds (Al-Moussawi, 1998: p. 43).

Soil

Soil is one of the most important natural factors that has a major impact on the variation in population density in Baghdad as it is the main source of food and drink (Al-Dulaimi, 1975: p. 188).

At the same time, it is not possible to consider soil as the main factor that has a direct impact on the distribution and concentration of population in one area rather than another. Hence, soil is one of the principal elements in its indirect impact on population distribution (Wahiba, 1972: p. 54). This effect appears clearly in agricultural regions through their relationship with agricultural crops, in quality and quantity, and their ability to support the population. The soil in Baghdad is classified into:

- A. Mixed soil: It is also called the soil of the palms of rivers. This type of soil is found on both banks of the Tigris River and its branches passing through Baghdad Governorate, and it has specifications that make it suitable for agriculture, as it is characterized by being of medium consistency, well-drained, and free of salts, and its ground water is deep so that it does not make the soil become salty. Water and air move from it. This type of soil is famous for growing several types of fruit trees, including vegetables and fruits. It is also possible to grow wheat, as most of the areas through which the Tigris River passes are famous for its cultivation at remarkably high rates (Ministry of Irrigation, 1970: p. 7).
- B. Mixed or clayey soil with a salt horizon: This type of soil contains salts that are formed by rising water near the surface of the earth, and when it evaporates, the salts are left behind. This type of soil has spread widely in Baghdad, especially in Tarmiyah, Al-Taji, Abu Ghraib, Yusufiyah, and Mahmudiyah. And Al-Latifayah (Al-Dulaimi, op. cit.: p. 197).

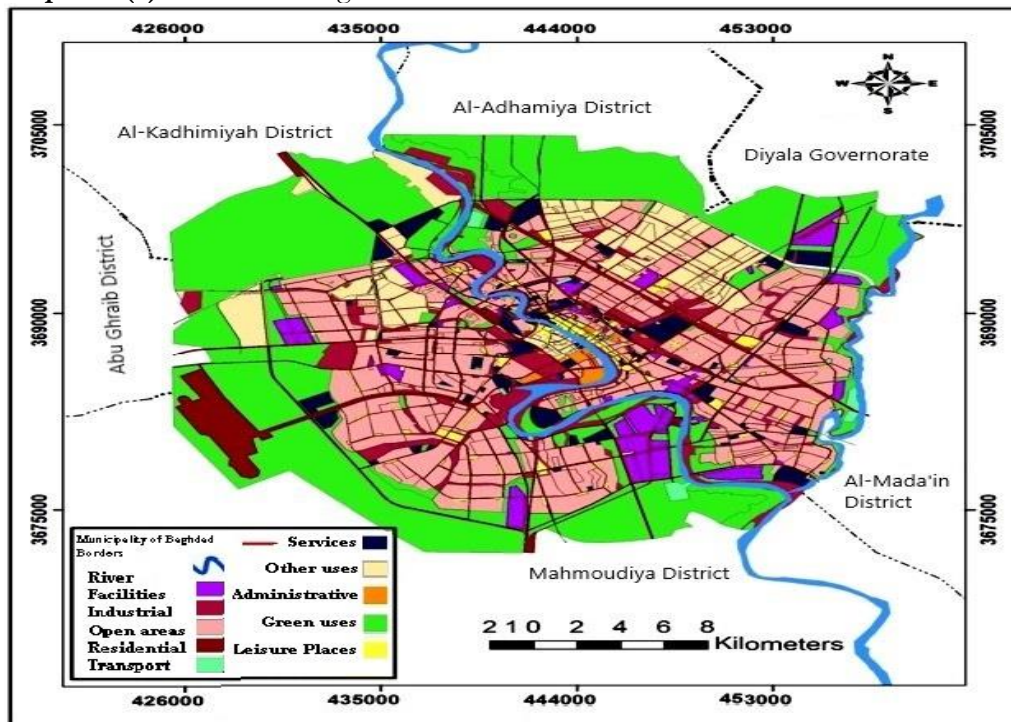
C. Soils of old depressions and streams: This group falls under the group of soils that were formed by winds or ancient riverbeds, as this type of soil is poor in nutrients and organic materials as it contains high salinity, and this type of soil is spread in the Al-Mada'in area only (Ministry of Irrigation, op. cit.: p. 8).

According to Map No. (3), it appears that the influence of the soil as a natural factor in the variation in population density in Baghdad Governorate is small. Therefore, we find that the influence of the soil in the administrative units within the borders of Baghdad and the concentration of population in them did not come because of the influence of the soil, but rather as a result of many human factors. Also, the population of the city of Baghdad is urban, except for some areas such as Al-Fahhama, New Baghdad, and Al-Mamoun. As for the city center, most of its residents are urban and do not practice any agricultural activity.

The further we get from the city center; we find that the influence of the soil factor is greater. The population density in the areas that lie outside the boundaries of the Baghdad Municipality is clearly affected by the soil, as the population tries to concentrate in areas with arable soil so that this soil is able to support its residents, so we find that the density Population is high in the areas of Taji, Tarmiya, Yusufiyah, and Latifiya, whose soil is considered to be of the mixed or clay type with a salt horizon, despite its disadvantages and drawbacks, but the population in these areas works to grow crops that tolerate high cultivation.

We find that the population in Baghdad prefers areas with mixed soil, which is called river palm soil, as it is fertile soil suitable for growing several types. Therefore, the population density in these areas, represented by the areas of the outskirts of central Baghdad, is higher than the rest of the areas, and the residents of these areas work to treat this type. of soil in order to plant various agricultural crops that are resistant to extreme salinity and to establish multiple irrigation projects.

Map No. (2): Soil uses in Baghdad.



Source: Baghdad Municipality, Basic Design Department, Geographic Information Systems Division, Baghdad Municipalities Map.

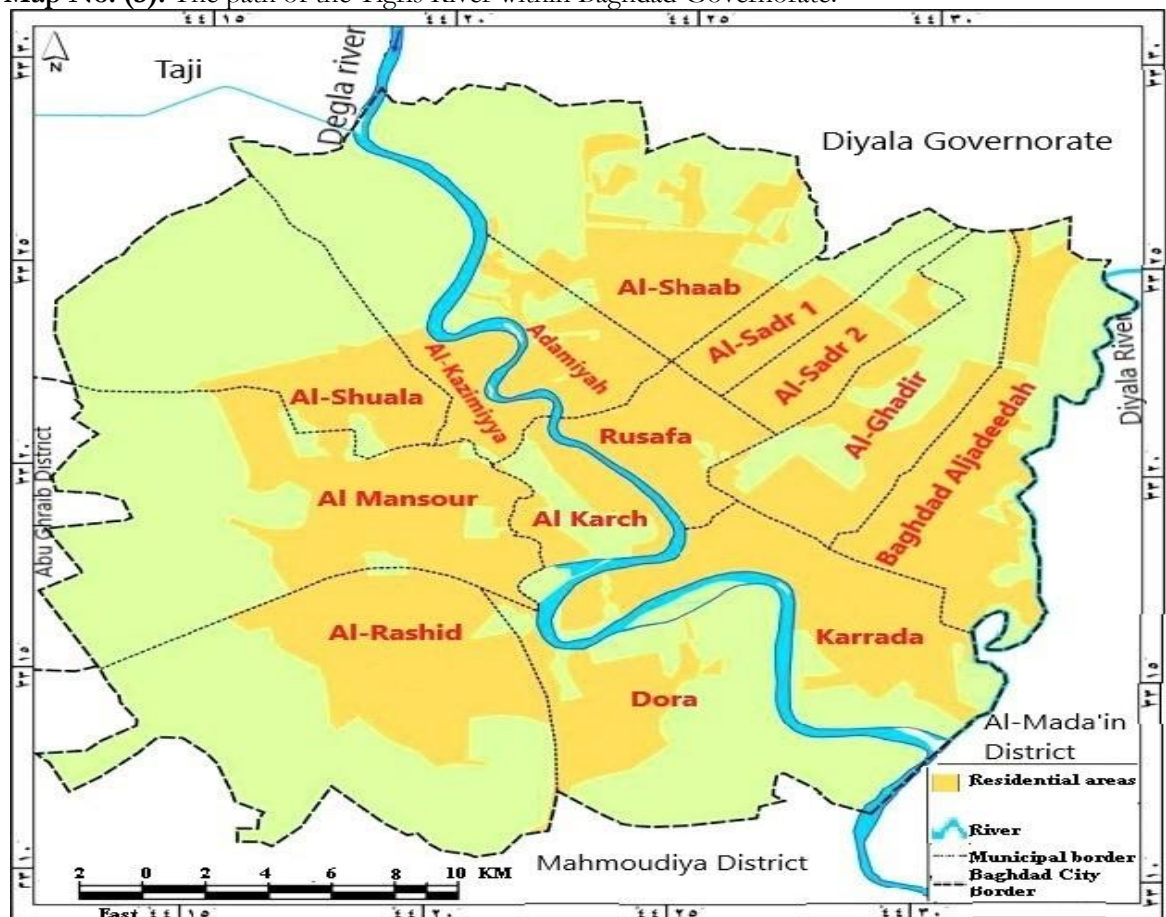
Water Resources

Rivers have a significant role in the formation of dense residential communities, especially in dry, rain-poor areas, which prompts residents to gather in the areas through which the rivers pass to meet their agricultural or industrial needs and other daily life requirements.

In Baghdad, we find that water resources, especially the Tigris River, play an important role in the population gathering and are a major reason for the city's growth and development. The Tigris River and its tributaries are considered one of the most crucial factors that attracted residents to this region, as the river enters Baghdad from the southern side and is connected to the tributary of the Diyala River, as shown in Map No. (3).

We find that the administrative units in Baghdad Governorate located near or adjacent to the Tigris River have a high population density, and this density gradually decreases in the administrative units far from water sources. The same applies to the administrative units located near the Euphrates River, which borders Baghdad to the west. The Euphrates River also affects the water resources inside Baghdad, so the population gathered densely in the areas of the Abu Ghraib creek, the Yusufiyah creek, and the Latifiyah creek, and irrigation projects increased, which facilitated the practice of activities. Agricultural (Al-Hiti, op. cit.: p. 80).

Map No. (3): The path of the Tigris River within Baghdad Governorate.



Source: Baghdad Municipality, Basic Design Department, Geographic Information Systems Division,

Baghdad Municipalities Map

Second: Human Factors

The human factor is considered one of the factors of immense importance in the distribution of population to regions and the difference in population density from one region to another. Some regions may have natural conditions that do not qualify the population to live in them, but human conditions can make this region suitable for habitation (Ministry of Transport and Communications, undated). Man plays a significant role in playing in the natural environment through the skills he has acquired that enable him to limit natural factors, control the environment in which he lives, and subject it to his control. The most important human factors affecting population density are:

1. **Transportation routes:** Roads are one of the factors that have a close relationship with population distribution and density. The presence of transportation in an area is considered one of the most principal factors that attract residents to it. On the other hand, the presence of population in an area is a crucial factor in the availability of transportation there. Transportation roads are important for people to move from one place to another and to market agricultural and industrial products in the region. The presence of roads in the region is a principal factor in attracting residents to it and thus increasing the population density in the region (Planning Authority, 2022: p. 54).

Baghdad is one of the Iraqi regions with high road density, as it constitutes a transportation node that connects various administrative units to each other, and connects the city with main and secondary roads, as it is connected with the city of Salah al-Din Governorate, Wasit Governorate, Babil Governorate, Anbar Governorate, and Diyala Governorate by major roads, and from On the other hand, Baghdad is connected to most district centers and other districts by secondary roads. The city of Baghdad is considered a center for main and secondary roads, and the presence of these roads was concentrated in the administrative units located within the borders of the city of Baghdad, which made the city distinct from distant areas, that is, the roads in the city increased as There is a high population density, which attracted residents to the city center to settle and live there. The existence of a local difference in the roads in the administrative units of Baghdad Governorate led to a difference in population density in those areas, as the roads that were completed in the city's suburbs are very few, such as the center of the Mahmoudiya District and its affiliated districts, and also in the Taji and Tarmiyah district, and the Abu Ghraib Center and its affiliated districts. Therefore, we find that the population density in these administrative units is low due to the lack of sufficient transportation roads.

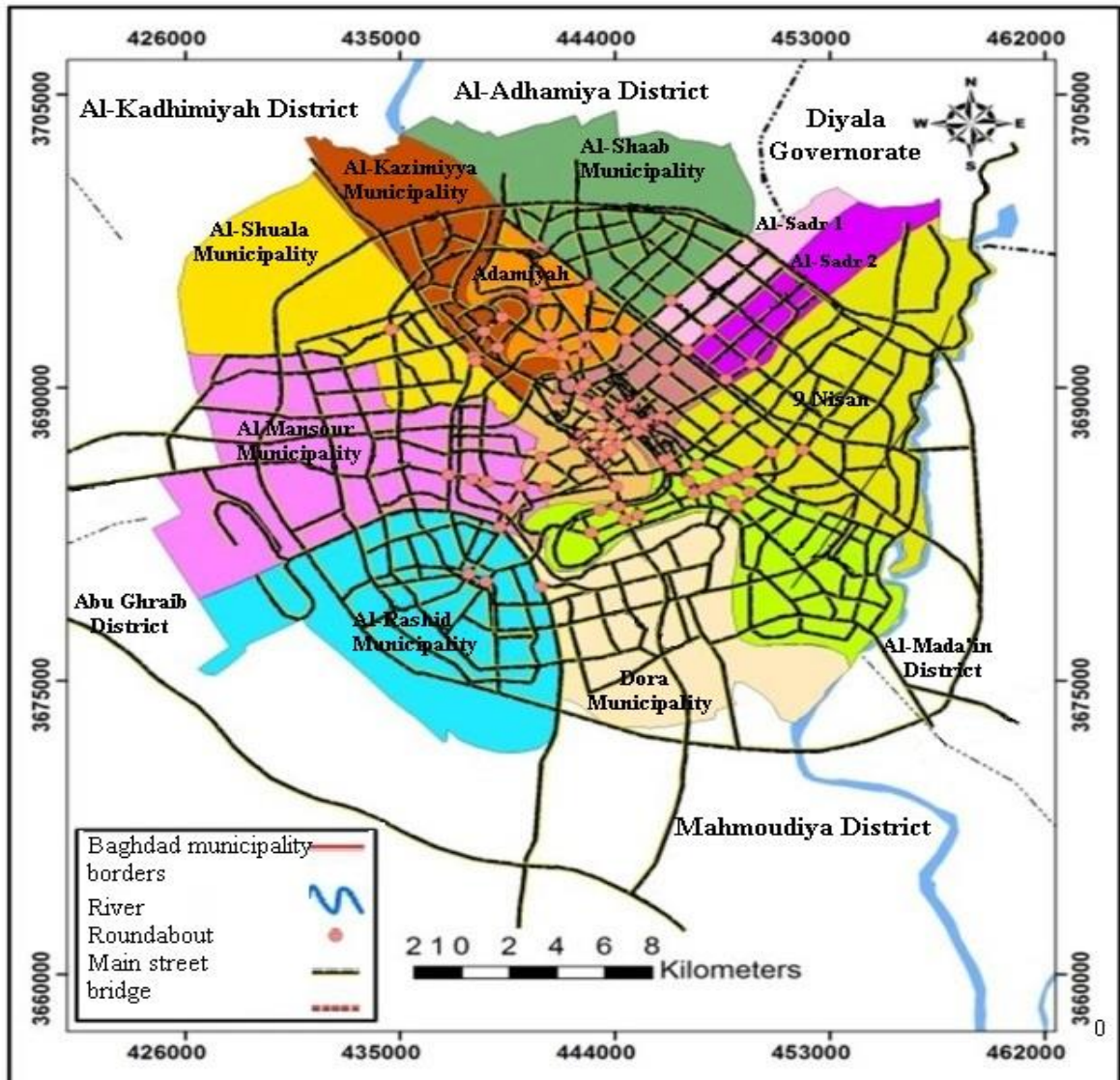
As for the residential units located within the borders of the city of Baghdad, such as Saddam District, the center of Adhamiya District, and Al-Mansour District, there are multiple secondary road networks linking the administrative units to each other, which attracted residents to these areas and increased the population density there.

From the above, and returning to Map No. (4), we find that the availability of highly efficient transportation routes in Baghdad Governorate helped increase communication between the residents of the suburbs and the residents of the city center, which reduced the cultural differences between the residents of the city and its suburbs and attracted many people to live and settle there (Al-Butahi, Source previously mentioned: 148).

2. **The religious factor:** The religious factor is one of the most important factors that affect the population distribution and density in Baghdad, as there are many sacred religious sites that attracted the population to them greatly, which greatly increased the population density of these areas to become areas with a high population density compared to other areas. The other is the presence of Imams Musa

al-Kadhim and Muhammad Jawad (peace be upon them) in the Al-Kadhimiyah area, in addition to the presence of the shrine of Abu Hanifa al-Numan in the center of Adhamiya, the presence of the shrine of Sheikh Abdul Qadir al-Kilani in the area (Bab al-Sheikh), the presence of religious centers in the center of al-Mada'in (Salman Pak). These areas have become the focus of attention of residents inside and outside the governorate as they provide many and diverse job opportunities with the aim of serving visitors coming to them.

Map No. (4): Roads and transportation in Baghdad Governorate.



Source: Baghdad Municipality, Basic Design Department, Geographic Information Systems Division, Baghdad Municipalities Map

Therefore, we find that the development of these areas and their population density is caused by it, and the presence of these sacred religious centers is considered to make residents prefer housing nearby, as

blesed areas, in addition to being considered tourist areas not only for the residents of the governorate, but for Iraq in general, and the residents prefer to go there.

3. **The administrative factor:** Administrative ranks greatly affect the distribution of the population, as administrative and municipal services are concentrated in the center of the governorate, and services are graduated after that, as the governorate is more than the district, and the district is more sub-district, and the sub-district is more than the villages, and these services vary to include (educational, recreational, and health services...etc.

The governorate center includes all government departments, and all economic services are available, which prompts residents to live there, which creates a high population density in the governorate center (Planning Authority, Central Bureau of Statistics, 2019: p. 94).

The population density is concentrated in the administrative units within the borders of the governorate center, within the borders of the governorate center. We find that the population density is high in the center of the Adhamiya district and the center of the Al-Kadhimiya district, and the density increases to become low in the outskirts of the governorate, such as the Al-Wahda district.

The area of the administrative unit is one of the factors affecting population density. The high population density in the Rusafa District Center, the Al-Kadhimiya District Center, the Karkh District Center, and the Adhamiya District Center is also due to the small area of each of them compared to the other administrative units.

Based on Table No. (2), it becomes clear that the administrative units mentioned constitute an exceedingly small percentage of the governorate's area when compared with the area of other administrative units, which are exceptionally large in area.

Table No. (2): Percentage of Area According to Administrative Units of Baghdad Governorate.

Percentage Unit Area to Governorate	Area	Administrative Units
0.23	12625	Rusafa District
1.0	49	Eastern Karrada District
2.2	111	Baghdad Aljadedah District
0.5	29	Adhamiya District
2	90	Fahama district
3	138	Rashidiya Subdistrict
0.4	21,5	Karkh District
2.4	119	Al-Mansour Subdistrict
1.6	82	Al-Ma'mun Subdistrict
0.6	32	Al-Kadhimiya District
6	288	Tarmiya Subdistrict
3.0	147	Aum Al Salasel Subdistrict
8	388	Taji Subdistrict
8.8	431	Abu Ghraib District
5.3	262	Alnasr Walsalam Town
1.3	68	Mahmoudiya District
10	486	Youssefiya Subdistrict
1.5	75	Saddam District
10	484	Latifiya Subdistrict
6.3	311	Al-Rashid Subdistrict
4.3	210	Al-Mada'in District
3.1	153	Aljisr Subdistrict
18.2	890	Al Wahda Subdistrict
100%	4877	Total

Source: From the work of the researcher, relying on the General Authority for Survey, unpublished data. The percentage is calculated by: $(\text{area of the administrative unit} \div \text{area of the governorate}) \times 100$.

Conclusions

The research reached a number of important conclusions:

1. Baghdad Governorate is one of the regions with a high population density and has been subjected to many administrative amendments, which led to changes in its population density.
2. The population density in the city of Baghdad increased significantly, and this increase included all the administrative units of the governorate.
3. The emergence of a difference in population density between administrative units, as there were administrative units with high density, while there were administrative units with low density.
4. Despite the emergence of administrative units with a high population density, they were not able to maintain this high level, but rather decreased significantly, and this is what happened in the center of the districts, such as the Rusafa District Center or the Karkh District Center, at a time when we find increasing population density in administrative units. Such as Al-Wahda sub-district, Al-Rashidiya sub-district, and others.
5. Most of the administrative units located within central Baghdad are considered high-density units due to the concentration of services therein compared to other regions.
6. The difference in population density was the result of the influence of many geographical factors (natural and human), and the influence of these factors was not at the same level in all regions.
7. The effect of the natural factor on population density appeared to be less than the effect of the human factor, and this was clear in the areas within the city of Baghdad, which are characterized by high population density.
8. The difference in population density in Baghdad and the proposals we mentioned encouraged us to propose recommendations, which we hope will be modest solutions that contribute, even if only a little, to solving the problem of the high population density in Baghdad and its difference from one administrative unit to another. These recommendations are:
9. The necessity of alleviating the population pressure that is increasing significantly in the residential units located within the city of Baghdad, by providing all necessary services to all citizens and distributing them fairly, in order to reduce the high population density in the administrative units located within the borders of central Baghdad, and increase the density in the units. located in its suburbs.
10. The necessity of working to reduce the increasing migration to Baghdad Governorate by adopting a population policy aimed at reducing the disparity between population densities.
11. The need to secure more job opportunities in order to push residents in administrative units located outside the borders of central Baghdad to remain in their administrative units, which reduces migration to Baghdad.

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