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Research Article

SPATIAL VARIATION IN THE POPULATION GROWTH OF KUFA DISTRICT FOR THE PERIOD (1977-2020)

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ABSTRACT

Population growth is one of the most prominent demographic phenomena in the modern era. It also indicates the dynamic characteristic of empowerment, the results of which are a basis that is strongly relied upon in economic, social, and future planning by knowing the population size because the population community is characterized by a dynamic (mathematical) nature, which led to the emergence of numerical increase or decrease. Therefore, there is no static population community. On this basis, Kufa District was chosen to collect the population, which is determined by a period of (1977-2020). The main objective of the study was to shed light on the fact of directing the population to Kufa District and the local teams, according to its affiliated districts, by reading the numerical distribution and the sabi in the district as a whole in addition to the environmental distribution, and then achieving this goal through the goal, the population was distributed and eliminated for that period in the district as a whole, but what the district witnessed in its increasing population size during the mentioned period, except that the treatment of growth in it varies temporally and spatially with the stages of building the city continuously, and thus continuing the process of filtering the population according to the administrative districts, in the district with an analysis of the reason for the difference in population growth between the administrative districts in the district, which leads to the variation in population

variance Between urban and rural areas for all periods of time, and the research was conducted on a collection of statistical and planning methods and means through the processes of inventory, accuracy, observation, and all data from their sources and analysis.

As for the most important findings of the research:

- The study showed that the Kufa district witnessed a large, existing, humid, and continuous population throughout the study period (1977-2020). This growth was evident in the population registration record, and their growth was for a reason. While the population in 1977 reached what was based on (50,815 people), it became in 2020 what was (208,436 people) due to the impact of the natural increase due to the population's increasing population and another due to migration from other governorates of the country.

The most important suggestions reached by the study:

Therefore, work on developing a brochure and population and functional policies to highlight the impressive population growth witnessed by the district. This strategy must secure what the city seeks: the basic and community infrastructure services and the success of the prominent force for residential areas.

KEYWORDS

Population Group, Population, Kufa District.

INTRODUCTION

Population studies are of great importance within the branches of human geography, as they represent the backbone of the development process in drawing its goals and stages, and interest in them increased after population growth (positive or negative), and what it reflects in the present and future, and accordingly, population growth clarifies the amount of change in population size, as the size of the increase is due to births, and the factor of decrease is due to deaths, in addition to the factor of migration in its two types, internal, which represents a factor of increase, and external, which represents a factor of decrease in population size, so it is necessary to identify its components and calculate its rates and the possibility of predicting it, and the extent of its impact on the geographical area, and since the population society is characterized by being a changing and developing organic being, characterized by dynamism as it does not remain in one state, and the large population increase witnessed by cities is nothing but the result of

rapid urbanization, which requires continuous planning and setting population policies to confront this steady increase, due to its relationship to many of the problems suffered by urban residents, represented by (the amount of need for educational and health services, infrastructure and community) and the effects it leaves It reflects all aspects of life, hence the importance of studying the population size, growth, distribution, age and gender structure, as it determines the size of the workforce, the standard of living, and the size of unemployment, and thus the amount of need for services. Thus, population growth is the main axis around which many studies and research revolve.

To achieve the study's main objective, the research relied on descriptive, analytical, and quantitative approaches to clarify the variation in the characteristics of the district's population. The description is indispensable to explaining the phenomenon. At the same time, the statistical methods used are based on analyzing the official statistical data related to the Kufa District population and extracting population growth rates accurately and abstractly.

From this standpoint, the research will study population growth in Kufa District, research the development of population size and annual growth rates, and show the extent of variation in population growth according to its administrative units, in addition to the numerical and relative distribution and

then show the distribution of general density and its variation at the district level and know the percentage of their concentration or dispersion, and based on the results reached, the fairness of distribution is revealed or not, and whether the population size is consistent with the capabilities available in the district in addition to the level of services.

The first section

1- The research problem

The main research problem revolves around the following question:

(What is the general trend of population growth? What changes have occurred in the patterns of population distribution in the Kufa district, whether in their numerical and relative distribution, density, or urban and rural?)
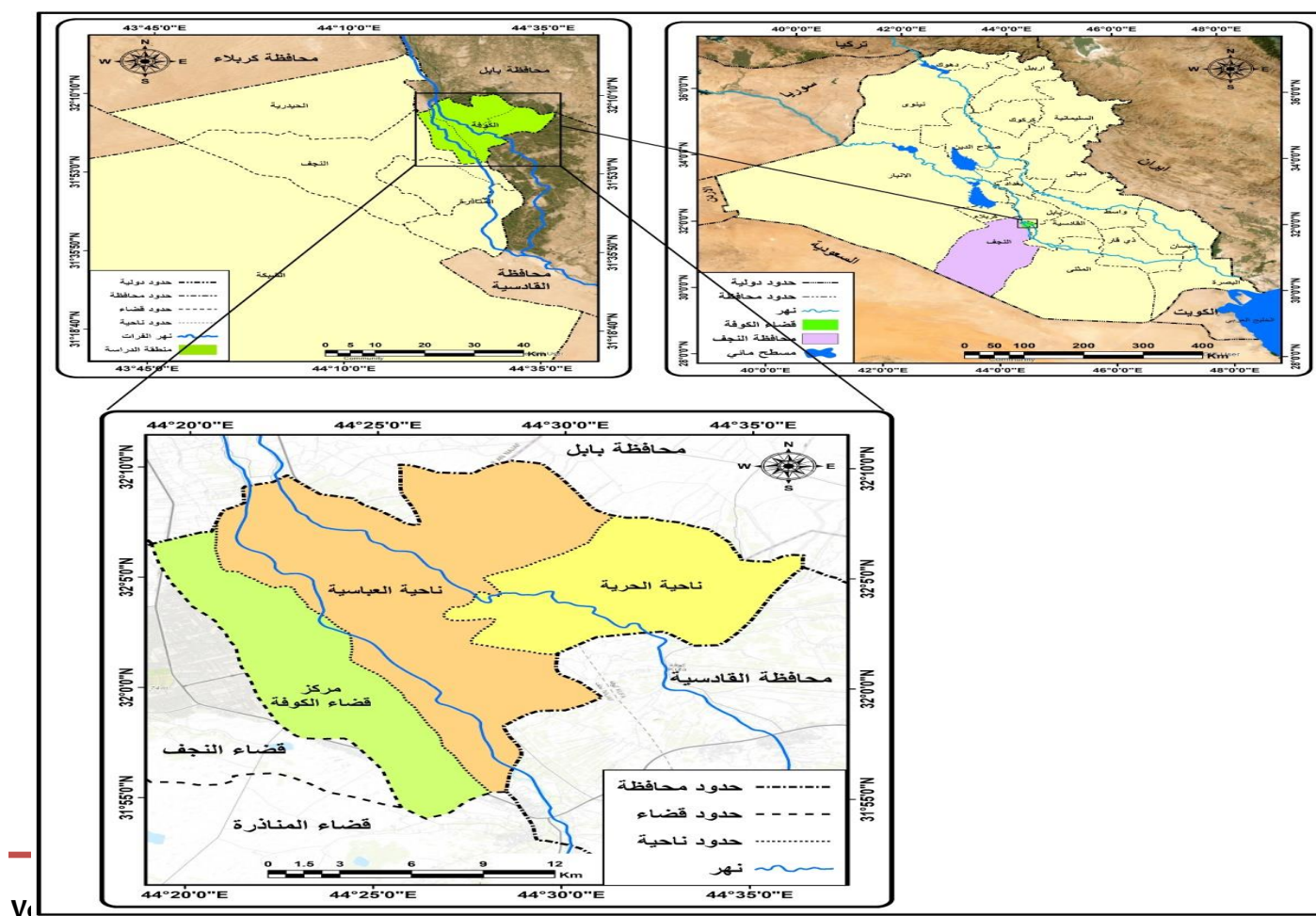
2- Research hypothesis

The population of Kufa district tends to increase as a result of the natural movement represented by births and migration, in addition to the disparity in population distribution according to the district's administrative units, and this disparity, whether between its urban and rural areas or in numerical and relative distribution or density, lies behind these changes many natural, human and economic motives.

3- Spatial and temporal boundaries of the study area

The spatial boundaries of the study area are represented by the area contained in the master plan and the municipal boundaries of Kufa District, which is one of the districts affiliated with Najaf Governorate, which is located astronomically between latitudes (1-32°, 4-32°) north, and the intersection of the longitude arc (20-44° and 26-44°) east, in the northeastern part of Najaf Governorate, bordered to the north by the city of Hillah at a distance of (60 km), to the east by the Abbasiya district at a distance of (6) km, to the south by Al-Mundhirah District at a distance of (15) km, and to the west by the city of Najaf at a distance of (10 km), while its location in Iraq is characterized as marginal on the edge of the western plateau and the far southwestern edge of the northern section of the alluvial plain at a distance of (10) km west of the Euphrates River, Map (1), i.e. within the planned urban area (municipal boundaries), with an area of (1752.57) hectares, while the time limits of the study are determined by the study period (1977-2020).

Map (1): The astronomical and geographical location of the city of Kufa in Iraq and the province of Najaf

Source: Republic of Iraq, Ministry of Water Resources, Directorate of General Survey, Administrative Map of Iraq and Najaf, 2023, scale (1000000:1), and outputs of Arc Map 10.8 program.

Numerical, relative and environmental distribution of the population of Kufa District

The term change in population studies is used to indicate the difference, whether in terms of increase or decrease, in the distribution of population phenomena between two known dates, as the distribution of these phenomena according to size, percentage or environment, always remains subject to change as a result of the difference in factors (natural and human) and characteristics, in addition to the political, economic and social importance of places, which work separately or connectedly in drawing the features of this distribution. Through quantitative change, it is possible to know the change in the relative strength of the distribution of population size in administrative units, and thus reflect the image of the disparity in the ability of regions to create attractive paths for the population and determine population growth trends (1).

A - The numerical distribution of the population of Kufa District

Numerical distribution means the population size in a specific area and at a specific time, meaning that this concept sees the quantitative or numerical basis as the main starting point for classifying ranks and determining their levels without giving importance to the percentage of what this size constitutes from the total percentage of the population of the state or region, and its causes and results differ in a specific time and place according to a system of influences, variables and characteristics (economic, social, historical) (2), to interact with each other and form the final image of the spatial distribution of the population, while the relative distribution took another approach, as it converted the population numbers into percentages that together constitute the total percentages of the population of the state and thus classified each region according to the amount it contributes to the total population (3).

The data in Table (1) and Figure (1) show that the distribution of the population in the district varies according to its administrative units, in terms of time and space, according to the years (1977-2020), as the population of the district in 1977 amounted to (50,815) people. The district center came in first place with a number of (47,062) people for the district's sub-districts, followed by Al-Hurriya district (2,506) people in second place, while Al-Abbasiya district obtained the last place with a population of (1,247) people. In 1987, the census data indicated that the total population of the district rose to (83,197) people. The district center accounted for (77,279) people because it represents the district center, followed by the administrative units

Al-Hurriya and Al-Abbasiya with a population of (3,614, 2,304) people, respectively. In the 1997 census, the population of the district reached (107,732) people. The district center maintained the highest percentage among its administrative sub-districts with a number of (97626) people, and Al-Hurriya district maintained its superiority with a number of (5597) people, over Al-Abbasiya district, which amounted to (4509) people. As for the estimates for the year 2007, it shows that the population size of the district increased to (147390) people, while the population size of Al-Hurriya and Al-Abbasiya districts approached (7658, 6171) people respectively, while the estimates for the year 2020 indicate that Al-Kufa district achieved a qualitative leap in its population size by (208436) people, the reason for this is generally due to the relative improvement in the general conditions and the health, economic and social level and the factor of security and stability in the district, which constituted an attractive factor for many residents of a number of governorates. The population size of the district center reached (133561) people, followed by Al-Hurriya district (13010) people, then Al-Abbasiya district (15019) people. The population increase also varied during the period (1977-2020) depending on the circumstances and conditions witnessed by the district. The district achieved a population increase of (32,382) people during the period (1977-1987), where it reached its highest in the district center with an increase of (30,217) people, then both Al-Hurriya and Al-Abbasiya districts (1,108, 1,057) people. As for the percentage of change during the years (1987-1997), it came to (24,535) people, which reveals a decline in the number of the district's population if compared to the previous period (1977-1987). The reason is due to the return of many immigrants to their home governorates, and the conditions of the unjust economic blockade imposed on the country in 1919, which negatively affected population growth. The district center and its districts achieved an increase of (20,347, 2,205, 1,983) people, respectively, while the population increase rose to (39658) people, during the period (1997-2007), with (35935) people for the district center, (2061) people for Al-Hurriya district, (1662) people for Al-Abbasiya district, while the increase achieved during (2007-2020) amounted to (61046) people in the district, with (46846, 8848, 5352) people respectively. Table (1): Distribution of the population in Kufa district according to its administrative units for the period (1977-2020) amounted to (61046) people in the district, with (46846, 8848, 5352) people respectively.

Table (1): Distribution of the population in Kufa district according to its administrative units for the period (1977-2020)
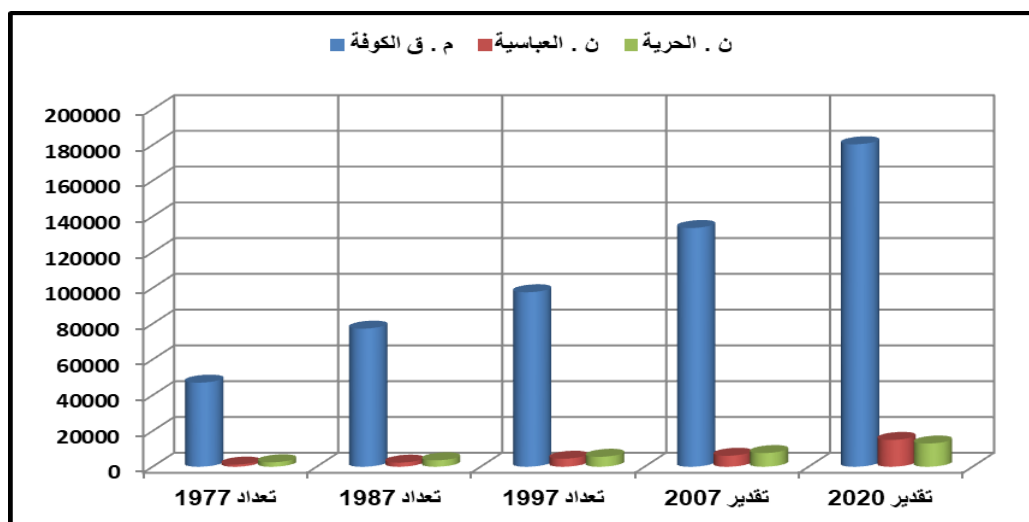
Censuses And Population Estimates / Population									Administrative Units
Absolute Change 2-2007 020	Absolute Change 2-1997 007	Absolute Change 1-1987 997	Absolute Change 1-1977 987	Appreciation 2020	Appreciation 2007	Count 1997	Count 1987	Count 1977	
46846	35935	20347	30217	180407	133561	97626	77279	47062	Kufa District Center
8848	1662	2205	1057	15019	6171	4509	2304	1247	Abbasiya District Center
5352	2061	1983	1108	13010	7658	5597	3614	2506	Freedom District Center
61046	39658	24535	32382	208436	147390	107732	83197	50815	Administrative Units

Source: The researcher based on:

- Republic of Iraq, Ministry of Planning, Central Statistical Organization, results of the general population census for the years (1977, 1987, 1997) for Najaf Governorate.

- Republic of Iraq, Ministry of Planning and Development Cooperation, Central Statistical Organization and Information Technology, Population Statistics Directorate, estimates 2007, 2020.

Figure (1) Distribution of the population of Kufa District for the period (1990-2020)

Source: The researcher based on data from Table (1)

B - The relative distribution of the population of Kufa district

It is one of the important measures that reveal the relative values of the city's population reality, as it is one of the most widespread and used methods, as it shows the percentage of what affects the administrative unit from the total population (4), that is, it is a simplification of the numerical distribution by converting those numbers into percentages that together constitute the total percentage of the population of the area to be studied, provided that this percentage and its difference in time and space can indicate the importance of the place and its development in a certain period. It is possible to analyze that importance and explain its reasons based on different numerical and population census data. (5)

The relative distribution of the population of Kufa district gives us a clear picture of the variation in their geographical distribution at the level of the district center and its affiliated districts during the period (1977-2020) and from Table (2) and Figure (2) it is clear that the district center ranked first with a percentage of (92.6%) of the total population of the district for the year 1977, as it alone accounted for more than half of the district's population, this percentage is due to it being the administrative center of the district where many economic and commercial activities are concentrated And various basic and luxury services for the population, while Al-Hurriya district ranked second with a percentage of (4.9%) of the total population of the district, followed by Al-Abbasiya district with (2.4%) of the population of the district. In 1987, the district

center maintained its first rank with a percentage of (92.8%) of the district's total population. The same applies to the districts of (Al-Hurriya and Al-Abbasiya), where the population percentage reached (4.3-2.7%) of the district's total population. In the 1997 census, the population percentage of the district declined to (90.6%) of the total population of the district due to the situation that the country and the district, in particular, went through, which is represented by the circumstances of the economic siege in addition to the impact of the immigration factor. The percentage of the districts of (Al-Hurriya and Al-Abbasiya) came to (5.1-4.1%) of the district's total population. As for the estimates for the years (2007-2020), it is noted that the district center, despite its acquisition of more than half of the district's population, the population percentage

declined from what it was during the years (1977 and 1987). By (90.6 - 86.5%) of the total population of the district, while the district's two districts (Al-Hurriya and Al-Abbasiya) achieved a significant increase in the population ratio by (5.1 - 4.1%) of the total population of the district is 2007, while the population ratio in Al-Abbasiya district rose to (7.2%) of the total population of the district, followed by Al-Hurriya district (6.2%) of the total population of the district. The reason for this increase is due to the large size of the district and its expansion at the expense of the agricultural lands and orchards surrounding it, in addition to the improvement of economic opportunities in work, and the establishment of many service institutions that attract the population.
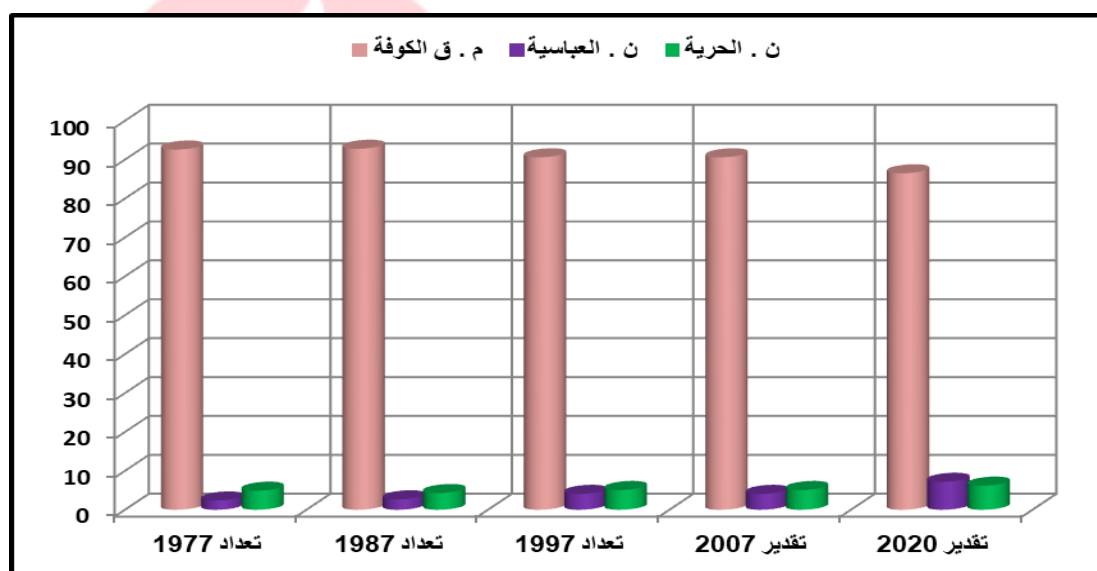
Table (2): Numerical and relative importance of the population of Kufa district for the period 1977-2020

2020		2007		1997		1987		1977		Administrative Units
%	Population Breeze	%	Population Breeze	%	Population Breeze	%	Population Breeze	%	Population Breeze	
86٬5	180407	90٬6	133561	90٬6	97626	92٬8	77279	92٬6	47062	Kufa District Center
7٬2	15019	4٬1	6171	4٬1	4509	2٬7	2304	2٬4	1247	Abbasiya District Center

6،2	13010	5،1	7658	5،1	5597	4،3	3614	4،9	2506	Freedom District Center
100	208436	100	147390	100	107732	100	83197	100	50815	Total

Source: The researcher based on Table (1)

Figure (2) The numerical and relative importance of the population of Kufa District for the period (1977-2020)

Source: The researcher based on the data in Table (2)

C - Environmental distribution of the population of Kufa District

The study of the population distribution between urban and rural areas is of great importance in population studies, as it reveals the spatial differences between them and the demographic, economic, and social aspects that follow these differences (6). The importance of this distribution lies in knowing the size of the urban and rural population, their characteristics, composition, and future expectations under the influence of the natural and spatial movement of the

population. The criteria used to distinguish between rural and urban areas differed, and among these are the population size of the settled area, population density, and characteristics of the region. In Iraq, the administrative and municipal character is the basis for distinguishing between rural and urban areas (7). The areas located within the municipal boundaries of urban areas are considered urban, while those outside the municipal boundaries are rural. The percentage of urban and rural populations in Kufa District varied for the period (1977-2020), as it becomes clear to us from the data in Table (3) and Figure (3) the extent of the development of the urban population in Kufa District compared to the total size As for the district's population, it became clear that the number of urban residents in the Kufa district in 1977 amounted to (42,371) people, exceeding the number of rural residents (8,444) people, for the total population of the district amounting to (50,815) people. The district center obtained first place with several (41,012) people compared to the districts of (Al-Abbasiya& Al-Hurriya), which obtained (911, 448) people respectively. In the 1987 census, the environmental distribution of the population varied, as the urban population increased by (69,867) people and the rural population by (13,330) people, which also increased in size from its predecessor. The district center also maintained its first rank of (67,853) people, which indicates that the gap has increased in size between the urban and rural

populations on the one hand and created a state of imbalance between the district center and its subordinate districts on the other hand. The reason for this is the concentration of institutions, administrative services, and government jobs in the center more than in rural areas, in addition to the factor of internal migration during the period of the Iran-Iraq war (1980-1988), which resulted in the concentration of most immigrants in urban centers. The urban population increase in the district continued until 1997, as census data indicate that the number of urban residents reached (82,755) people. Al-Abbasiya district had the lowest population (1,510), while the number of rural residents reached (24,977) people out of the total population of the district of (107,732) people. As for the estimates for the year (2007-2020), they were characterized by a high percentage of urban residents in the district as a whole, reaching (99,316 121,476) people out of the district's total population. As for the rural population, it also surpassed it during the mentioned period by (48,074 86,960) people, but in general, it is less than the urban population in the district. In general, it can be said that the increase in the percentage of urban residents, at higher rates than rural residents, is attributed to the change in the population structure from a rural-agricultural character to an urban character due to the availability of job opportunities and the diversity of services in the city.

Table (3): Environmental distribution of the population of Kufa District for the period (1977-2020)

2020		2007		1997		1987		1977		Administrative Units
Countryside	City	Countryside	City	Countryside	City	Countryside	City	Countryside	City	
70957	109450	39936	93625	18716	78910	9426	67853	6050	41012	Kufa District Center
8002	7017	3689	2482	2999	1510	1400	904	799	448	Abbasiya District Center
8001	5009	4449	3209	3262	2335	2504	1110	1595	911	Freedom District Center
86960	121476	48074	99316	24977	82755	13330	69867	8444	42371	Total
208436		147390		107732		83197		50815		

- Republic of Iraq, Ministry of Planning, Central Statistical Organization, Results of the General Population Census for the years (1977, 1987, 1997) for Najaf Governorate.

- Republic of Iraq, Ministry of Planning and Development Cooperation, Central Statistical Organization and Information Technology, Population Census Directorate, Estimates 2007, 2020.

The second section

1 - Population growth in the Kufa district

Population growth in the literature of demography refers to the increase or decrease in the size of the population during a certain period, i.e., it indicates that it does not proceed in one direction; its movement may take an upward or downward direction, depending on the circumstances of the country in question. In the

first case, the population size may decrease to a point called (the replacement level). In contrast, in the second case, the opposite may happen, where the growth rate reaches a population explosion due to high birth rates and low death rates, in addition to the impact of the immigration factor (8).

It is noted from the data in Table (4) and Figure (4) that the growth of the district's population varies from one side to another. The annual growth rate of the district center was characterized by variation during the mentioned study period, as it was estimated for the period (1977-1987) (5.05). Al-Abbasiya district achieved the highest growth rate in the district at (6.3), followed by the district center at (5.08), then the rate decreased to (2.6) from (1987-1997). The reason is attributed to the deterioration of economic and social conditions due to the economic blockade that the country witnessed, the decline in the natural increase rate, and the cessation of migration to cities. As for the period (1997-2007), the growth rate increased from what it was previously at (3.5), as the population growth rates in the district and its two districts converged, in the

achieved growth rate (3.1), which indicates an improvement in the economic, social and health conditions in the country in general and in the district in particular. The estimates for the year (2007-2020), indicate a population growth rate of (2.7) for the entire district, with (7.08), (4.1), (and 2.3) for each of the Abbasiya and Al-Hurriya districts, the district center, respectively.

It is clear from the above that the population of the Kufa district is constantly increasing, and growth rates vary between the two districts. Still, in general, they are characterized by an increase due to the natural increase, the improvement of the health, economic, and social level, and the low death rate, in addition to the impact of internal migration and its impact on population growth, as the city enjoys the attraction feature (locational and functional), in addition to being the administrative center of Kufa district and providing job opportunities and services, which caused the attraction of large numbers of them, especially the southern governorates.

Table (4): Population growth rates in Kufa district for the period (1977-2020)

Annual Growth Rate of the District's Population *				Administrative Units
2020 - 2007	2007 - 1997	1997 - 1987	1987 - 1977	
2.3	3.1	2.3	5.08	**Kufa District Center**

7.08	3.1	6.9	6.3	Abbasiya District Center
4.1	3.1	4.4	3.7	Al-Hurriya District Center
2.7	3.5	2.6	5.05	Total

Source: The researcher based on: - Data from Table (1), * (9) The growth rate was extracted based on the following equation:

$$R = \left(T\sqrt{\frac{P1}{P0}} - 1 \right) \times 100$$

Number of years between the two censuses = T = Population in the first census, Po
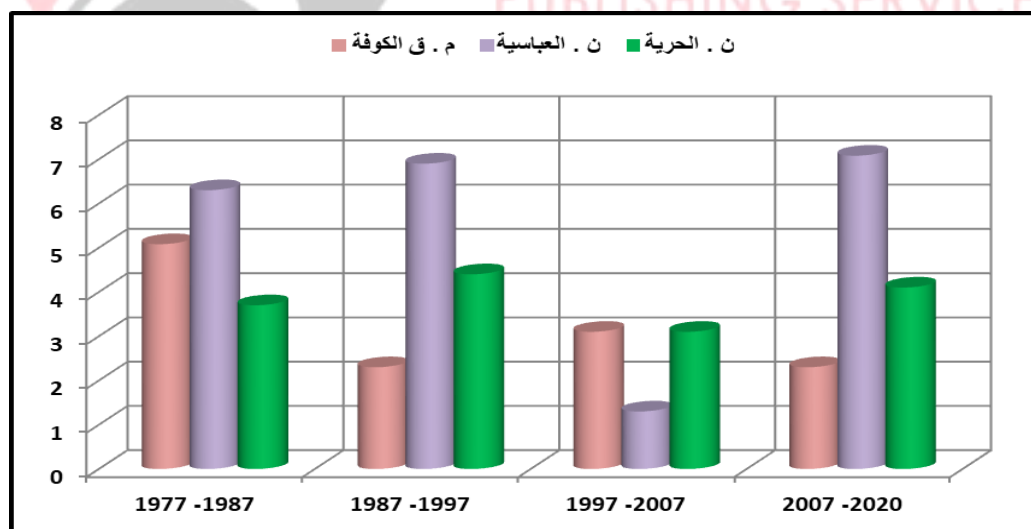
Population in the second census = P1 Annual growth rate, = R

Figure (4)

Population growth rates in Kufa District for the period (1977-2020)

2- General population density in the district

The study of population density in the city has received great importance, as it gives a clear picture of the

nature of the population density distribution at the very least, and thus the possibility of analyzing the density variation of this distribution, and it is known as a measure to know the extent of saturation of a certain area with its population, and it is calculated by the number of people in each km, and thus it highlights the relationship between the human being and the area of land on which they live, and thus reaching specific numbers that clarify the extent of the population's tendency to concentrate, or disperse within the boundaries of the spatial units (10), and then giving an important indicator to the competent authorities and city planners in drawing a picture of the distribution and arrangement of functions in the urban space in a manner that is consistent with the size of the population to create an urban environment characterized by the efficiency of its functions and services (11). Since the study of the numerical and relative distribution of the population through their absolute numbers or percentages cannot give a clear idea about the nature of their spread or concentration, it may not be a valid measure for comparison between administrative units (12). Relying on population density indicators necessarily allows such possibilities to analyze the picture of population distribution in the city or administrative units because the population is not distributed regularly due to its connection to several factors that may be economic, social, and natural and may overlap and be interconnected with each other in most cases so that the population

appears to be a product of the interaction of urban systems in cities (13). To obtain the general total, the following formula is adopted (14):

(What is the area in the population total number)/(Total area this area) General population density =

The results resulting from applying the equation for the general population density and the data in Table (5) indicate that the total general density of the Kufa district for the year 1977 amounted to (116) people/km in the district as a whole, and the district center came with the highest population density amounting to (364) people/km, while It increased to (190) people / km2 in 1987, the center of Kufa district maintained the highest density in the district at (599) people / km2, and the reason is that it is the central administrative center of the city that contains most of the services and activities, in addition to the influence of the religious factor represented by the shrine of Muslim Ibn Aqil, and Mitham Al-Tammar (peace be upon him), which the researcher considers the basis for the existence, continuity and development of the district. This factor attracted the population and human gatherings. It concentrated them directly in urban gatherings around the shrine from ancient times. It is still a factor of attraction and goal for immigrants from within the district's borders, the governorate, and the rest of the country's governorates. As for 1997, the general density of the district, in general, exceeded its

predecessor by (437) people / km2 by (756), (53), (25) people / km2 for each of (the center of Kufa district, and the districts of Al-Abbasiya and Al-Hurriyah) respectively. As for the estimates for 2007 and 2020, the population density rate of the district continued to rise (337 476). The district center also continued to excel at (1035 1399) people/km. It is noted from the analysis of the data in Table (5) that the general density of the Kufa district is increasing exponentially, which is an inevitable result of the increasing population size of the district, in addition to the importance enjoyed by the district, which made it a population center for the city of Najaf and then the governorate. In addition, the district was affected by the expansion of the city of Najaf at the beginning until the urban connection between the suburbs of the two cities appeared.

Table (5): General population density of Kufa district for the period (1977-2020)
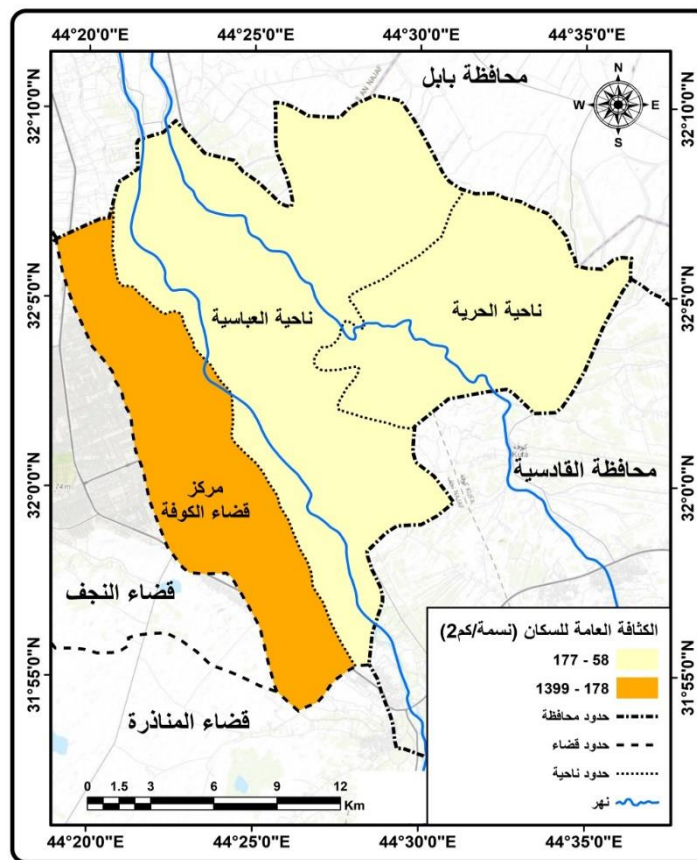
2020			2007			1997			1987			1977			Administrative Units
General Density Km2	Area	Population	General Density Km2	Area	Population	General Density Km2	Area	Population	General Density Km2	Area	Population	General Density Km2	Area Km2	Population	
1399	129	180407	1035	129	133561	756	129	97626	599	129	77279	364	129	47062	**Kufa District Center**
177	85	15019	72	85	6171	53	85	4509	27	85	2304	15	85	1247	**Abbasiya District Center**
58	223	13010	34	223	7658	25	223	5597	16	223	3614	11	223	2506	**Al-Hurriya District Center**
476	437	208436	337	437	147390	246	437	07732	190	437	83197	116	437	50815	**Total**

Source: The researcher based on data from Table (1).

- Ministry of Planning, Central Statistical Organization, Najaf Governorate Statistics Directorate, 1997 Census Results, and 2017 Estimates, Table 15-32, p. 69.

Source: Republic of Iraq, Ministry of Water Resources, Directorate of General Survey, Administrative Map of Iraq and Najaf, 2023, scale (1:1000000), and Arc Map 10.8 program outputs.

4- Population concentration of Kufa District

Population researchers have been interested in the subject of population concentration, as they have indicated that the process of population distribution aims to reveal the relationship between the population and the place where they are located, and to give an image of the variation in their geographical distribution. Therefore, trying to identify the degree of population concentration (i.e. the increasing presence of the population in a certain area) is a very important matter, which aims to reveal the axes of population spread and the places of their concentration (15). The population concentration ratio is calculated in light of calculating half the sum of the positive difference

between the percentage of the area and the percentage of the number of residents in each area or any administrative unit in the city. The large population ratio indicates the intensity of concentration, and with its smallness, the concentration begins to decrease and the phenomenon of dispersion becomes prevalent (16). The negative sign indicates the unfairness of the population distribution by increasing the area unit, and the positive sign indicates that the administrative units whose area capacity is still open to receive the population. There is no doubt that knowing the population concentration or lack of concentration or their dispersion has implications and implications related to With the development policies and projects adopted by government departments and competent authorities (17), and they can be extracted according to the following formula:

$$C = \frac{1}{2}\sum (X - Y)$$

Where:

C = population concentration ratio

X = represents the percentage of the population of the region from the total population of the entire region

Y = the percentage of the area of a specific region from the total area of the entire region

sum of the difference (18)

It is clear from the data in Table (6) that the concentration ratio in Kufa district for the year (1977) reached (63), which indicates some relative spread, as the limited number of residential neighborhoods in the district center and its two districts, and the relatively small population led to a relatively dispersed spread, i.e. spread within known boundaries in the district center. As for the year 1987, the concentration ratio reached (63.2), as it proceeded in the same general direction as the population concentration pattern for the previous year with some concentration in the district center. In the year 1997, it reached (30.5), which is an indicator of population concentration within a known area. The relative decline in the population due to the conditions witnessed by the country, which were mentioned previously, led to the concentration of the population within a known urban area. In the estimates for the year 2007, the population concentration ratio reached (61). It is known that with the increase in the value of population concentration, this indicates the severity of population concentration and the unfairness of its distribution, and this is what is noted in the estimates for the aforementioned year. As for the year 2020, the concentration ratio reached (108.4), as it indicates The ratio of the high concentration also in the district as a whole, which requires the population to leave the administrative unit, to create a kind of spatial balance in the distribution of the population, or to put controls that limit the migration of the population of the district to

avoid problems or environmental impacts that may appear in the future.

Table (6) :Population concentration ratio in the district of Kufa for the period (1977-2020)

2020			2007			1997			1987			1977			Administrative Units
$\frac{1}{2}X-Y$	Area% (X)	Population % (Y)	$\frac{1}{2}X-Y$	Area% (X)	Population % (Y)	$\frac{1}{2}X-Y$	Area% (X)	Population % (Y)	$\frac{1}{2}X-Y$	Area% (X)	Population % (Y)	$\frac{1}{2}X-Y$	Area% (X)	Population % (Y)	
-57	29.5	86.5	-30.5	29.5	90.6	-30.5	29.5	90.6	-31.6	29.5	92.8	-31.5	29.5	92.6	Kufa District Center
-26	19.4	7.2	7.6	19.4	4.1	7.6	19.4	4.1	8.3	19.4	2.7	8.5	19.4	2.4	Abbasiya District Center
22.4	51.0	6.2	22.9	51.0	5.1	22.9	51.0	5.1	23.3	51.0	4.3	23.0	51.0	4.9	Al-Hurriya District Center
108.4 / 100		100	61 / 100		100	30.5 / 100		100	63.2 / 100		100	63	100	100	Total

Source: The researcher based on:

- Table (2, 5).

From the above, it is clear that the distribution of the population of Kufa district tends to be concentrated, as indicated by the negative values obtained by the district center and its two districts during the mentioned period, which indicates the intensity of concentration in contrast to the limited urban space and the increasing population increase, which is a reality that confirms the necessity of the intervention of the concerned administrative and planning authorities in understanding this reality and planning for it in a way that achieves a state of environmental balance.

The third Section

The impact of population growth on the urban environment of Kufa District

The population mainly drives the city's functions and urban activities. They are the ones who live in the city and are affected by the service, planning, and social reality. In return, the city is affected by the demographic characteristics of its residents. Therefore, it is clear that a relationship and interconnected factors are mutually influential and affected (18). The city's population grows due to several factors, including the natural increase in population, low mortality, migration due to economic

development, and population attraction to its urban area. There may be a period when this area needs to accommodate the large population size, which casts its shadow on the efficiency and sufficiency of its urban services. The emergence of many problems, including those related to the provision of potable water, sanitation services, educational and health services, and the increase in residential slums, among many others, leads to increased administrative difficulties in economic and social development in the city. Kufa district has been growing rapidly for a long time, which is inconsistent with the growth of urban jobs and services. Economic, political, and social factors have contributed to preparing the causes of growth that were unplanned and undirected. It is considered one of the cities that attracts residents due to its religious function in the first place, which made it have a great impact on urban and population attraction and concentration, in addition to the concentration of other urban functions, especially commercial ones, in addition to public services, which led to an increase in the continuous migration movement to it from various other governorates of the country, which was reflected in the increase in its size from a demographic point of view and affected the natural functions of its urban area, as life in it became a package of crises and bottlenecks, the failure of municipal services, traffic congestion, frequent water cuts, increasing unemployment, the exacerbation of the problem of urban poverty, the high cost of housing, the expansion

of the areas of residential slums and encroachment on agricultural lands and surrounding orchards, which worked to decrease the city's lung and its only outlet, which makes the district unable to meet the requirements of its current residents or those who are added every year. And those are now looking for a minimum decent living in a heated atmosphere of population growth.

The ability of the district to provide is determined by its ability to satisfy the needs and requirements of its residents, which is linked to the scale of the population and its ability to invest in the available economic and service capabilities. There is no doubt that the continued rapid and unplanned population and urban growth, as we have indicated, leads to the destruction of the city and its residents simultaneously, and this is what we are trying to clarify. Therefore, the study decided to present some recommendations, alternatives, and realistic planning treatments that we hope will work to address or mitigate the severity of the problems resulting from the steady increase in the size of the population and urbanization in the district, which are as follows:

1. The necessity of working on developing population and functional strategies and policies to confront the rates of rapid population growth witnessed by the district, and this strategy must secure the city's needs for infrastructure and community services according to the absorptive capacity of residential areas. 2- Taking

demographic factors (population growth, population density, population distribution) into consideration by planners when drawing up population policies for the district and linking them with the needs of the local community on the one hand and economic and social development projects on the other hand, to control the direction of population movement and stability.

3- Working to increase interest in rural areas by the competent authorities, especially paving roads to reduce the gap between rural and urban areas, which works to reduce the concentration of population in urban areas and reduce the continuous migration flows.

4- The necessity of a process of movement in service planning in a way that provides services in terms of quantity and quality that match the development in the different population densities in the district's areas, which achieves justice in the distribution of these services.

5- Considering the distribution of development projects across all governorates of the country in an equal and equivalent manner and according to the population size in each governorate to reduce migration between the governorates of the country.

1- The study showed that the Kufa district witnessed a large, rapid, and continuous population growth throughout the study period (1977-2020). This growth was evident in the development of the population numbers and their annual growth. While the population in 1977 amounted to (50,815 people), in 2020, it became (208,436 people) due to the influence of internal factors related to the amount of natural increase in the district's population and other external factors due to immigration from other governorates of the country. 2- The study revealed the spatial disparity in the population distribution between the district center and its two districts regarding their population sizes. The district center had the largest population size compared to its two districts (Abbasiya, Al-Hurriya) when the district population in 1977 reached (47,062) people, while it reached (180,407) people in 2020, which is equivalent to a third of the city's size, which affected the variation in population characteristics and thus the amount of its entitlements from urbanization and services under the influence of factors related to the date of the establishment of the district and its relationship to the population growth factors referred to above.

3- The study concluded that the population growth rate exceeded the speed of urbanization and services growth, in addition to being the main influencer and guide for the rest of the variables due to its nature as the backbone and main driver of the urban environment and structure.

4- The high percentage of urban residents in the district compared to the percentages of rural residents during the study period due to the administrative character of

the district center, as well as the availability of services compared to rural areas. 5- The rapid and unplanned population growth has led to imbalances in the mechanisms of their distribution, density, and concentration, which resulted in the existence of different distribution patterns between extreme concentration in some years and relative spread in others, which later led to the emergence of problems in providing services in terms of their sufficiency and efficiency, meaning that the provision of services was not based on future planning visions about estimating the population size and the city's need for them.

6- The lack of awareness of the population issue and the departure from monitoring it continuously and not finding appropriate solutions to the resulting increases puts us in front of many very dangerous issues in the long term, especially if the state of balance between the number of people and the available resources is not taken into consideration.

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