

SPATIAL VARIATION IN THE GROWTH OF THE POPULATION OF THE GOVERNORATES OF IRAQ FOR THE PERIOD 2010-2020 AND ITS EXPECTATIONS FOR THE YEAR 2030 AD

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Abstract

The research findings revealed that the province of Anbar boasts the largest area in Iraq, accounting for a significant proportion of the country's total area at 31.7%, whereas the province of Baghdad has the smallest area, representing only 1.0% of the total area. As for the population distribution, Baghdad Governorate has the highest percentage of inhabitants at 21.2%, while Al-Muthanna Governorate has the lowest percentage, with a figure of 2.2%. Notably, the Iraqi population exhibited a growth rate of 2.1% during the period of 2010-2020 AD, with urban areas recording a higher growth rate of 2.3%, as opposed to rural areas that experienced a rate of 1.8%. The research further projected that the population of Iraq would reach approximately 49,675,379 by the year 2030, with an urban population of 35,214,703 and a rural population of 14,460,676.

Keywords: Iraqi population growth, urban areas, rural areas, expectations

INTRODUCTION

Population growth is one of the topics included in population studies, as all population societies are characterized by a dynamic nature due to the numerical increase or decrease in the population, and this increase and decrease is represented by the vital activities of the population, which are births that represent the positive factor towards increasing the size of the population, while deaths represent the negative factor towards decreasing The size of the population, as well as the migration factor, are among the factors that play an important role in the increase and decrease in the size of the population. It varies from one place to another and from one period to another according to the economic, political, and social conditions of the country in which the population lives and according to the population policy as well. Negative for population growth, as well as health and living conditions. Therefore, when studying population growth, it is required to know the size of the population during the study period and then data and information on the factors affecting population growth, which are births, deaths, and migration.

Researchers in Human Sciences, including geographers, rely on defining the problem (Question) and studying the problem is one of the recent trends in the science of geography. The problem raised in this research is represented by the following questions:

- 1- Does the numerical and relative distribution differ according to the environment of the governorates of Iraq?
- 2- Is there a discrepancy in the population growth rates according to the environment of the governorates of Iraq?
- 3- What are the future expectations of the population according to the environment for the governorates of Iraq for the year 2030 AD?

After the problem has been selected and identified, we put hypotheses that are preliminary answers to the problem. The hypothesis of this research came in the following formulas:

- 1- There is a spatial difference in the numerical and relative distribution of the population according to the environment of the governorates of Iraq.
- 2- Is there a clear spatial variation in population growth according to the environment in the governorates of Iraq?
- 3- The future population growth is heading towards an increase in the size of the Iraqi population for the year 2030 AD.

This research aims to know the numerical and relative distribution and population growth rates according to the environment in the governorates of Iraq, and then to know the future expectations of the population of these governorates for the year 2030 AD.

This research was based on the analysis of spatial relations, which is the basis in the science of geography and the description of the phenomenon in order to reach its causes and the factors that control it and draw conclusions for generalization. The spatial boundaries of this research are represented by the governorates of Iraq, whose astronomical location is determined between longitudes (38, 45) east from its west and longitude (48, 45) east from its east, and is confined between two latitudes (5, 29) north from its south and (22, 37) to the north, it passes in its northern borders, and a geographical location (Position), as it is located in the southwest of the continent of Asia, occupying the northeastern part of the Arab world, bordered by Iran to the east, Turkey to the north, Jordan and Syria to the west, Kuwait and Saudi Arabia to the south, and the spatial boundaries of the research are represented in Iraq by governorates (18) governorates, as shown in table (1). The temporal boundaries of this research extend in the period (2010-2020 AD) and the future expectations of the population according to the environment for the year 2030 AD were known.

Table (1) Area and percentage of Iraq's governorates

| Area Rate | Area km ² | Governorate | No. |
|-----------|----------------------|--------------|-----|
| 8,6 | 37323 | Nineveh | 1 |
| 2,2 | 9679 | Kirkuk | 2 |
| 4,1 | 17685 | Diyala | 3 |
| 31,8 | 137808 | Anbar | 4 |
| 1,0 | 4555 | Baghdad | 5 |
| 1,2 | 5119 | Babylon | 6 |
| 1,2 | 5034 | Karbala | 7 |
| 3,9 | 17153 | Wasit | 8 |
| 5,6 | 24363 | Salahaddin | 9 |
| 6,6 | 28824 | Najaf | 10 |
| 1,9 | 8153 | Qadisiyah | 11 |
| 11,9 | 51740 | Double | 12 |
| 3,0 | 12900 | Dhi Qar | 13 |
| 3,7 | 16072 | Maysan | 14 |
| 4,4 | 19070 | Basra | 15 |
| 3,5 | 15074 | Erbil | 16 |
| 1,5 | 6553 | Dohuk | 17 |
| 3,9 | 17023 | Sulaymaniyah | 18 |
| 100 | 434128 | Total | |

Source: Ministry of Planning, Central Statistical Organization, Annual Statistical Abstract for 2016, Chapter One, Normal Conditions, Table 1/1, p.1.

The population distribution is one of the important issues in which the relationship between the population and the land and their location emerge, and that the pattern of population distribution on the surface of the earth is a set of factors intertwined with each other. The distribution process is subject to continuous changes, and at the present time we notice a severe lack of focus because large proportions of the population are concentrated in cities with relatively limited areas, and that differences in distribution are also caused by population growth rates (Al-Saadi, 2014 AD, Part 1, p. 110) and among the types of distribution is:

1- Numerical distribution

Numerical distribution means the distribution of the population in the area over which they live, and this distribution represents the population's connection to the resources available in each region, and that the resources, whether natural or human, are characterized by change in quantity and quality, so the numerical distribution of the population changes accordingly in time and space (Al-Kitab, 2015, p. 260). The population distribution map is one of the most important maps in geographical studies because it is a mirror that reflects all geographical elements. Considering this,

most studies include a detailed study of population distribution, for the purpose of contributing to development plans in a scientifically correct way and a better life for each member of the population, and this is what human development aims at (the hard 2018 AD, p. 62).

1-1 The numerical distribution for the year 2010

From table (2), the population of urban Iraq has reached (22,418,081) people. Baghdad governorate has the highest urban population, amounting to (5,995,812) people. Al-Muthanna Governorate has the lowest urban population, amounting to (306,610) people. The population of rural Iraq has reached (10,071,891) people, Nineveh Governorate recorded the highest number of rural residents, amounting to (1,249,778) people, and Maysan Governorate recorded the lowest number of rural residents, amounting to (261,312) people. 6,878,039) people, and Al-Muthanna Governorate recorded the lowest population, which is (700,818) people.

1-2 The numerical distribution for the year 2020

From table (2), the population of urban Iraq has reached (28,052,250) people, the Baghdad governorate recorded the highest urban population, amounting to (7,488,087) people, and the Muthanna governorate recorded the lowest urban population, amounting to (398,334) people, and the population of rural Iraq has reached (12,097,923) people, Nineveh Governorate recorded the highest number of rural residents, amounting to (1,546,083) people, and Maysan Governorate recorded the lowest number of rural residents, amounting to (306,272) people, and the population of Iraq has reached (40,150,173) people, Baghdad Governorate recorded the highest population, amounting to (8,558,625) people, and Al-Muthanna Governorate recorded the lowest population, amounting to (857,662) people.

Table (2) The numerical distribution of the population according to the environment in the governorates of Iraq for the years (2010 - 2020 AD)

| 2020 | | | 2010 | | | No. |
|------------|------------------|------------------|------------|------------------|------------------|-------|
| Population | Rural Population | Urban Population | Population | Rural Population | Urban Population | |
| 3928215 | 1546083 | 2382132 | 3187945 | 1249778 | 1938167 | 1 |
| 1682809 | 438928 | 1243881 | 1360442 | 385450 | 974992 | 2 |
| 1724238 | 875888 | 848350 | 1406592 | 731992 | 674600 | 3 |
| 1865818 | 932601 | 933217 | 1521829 | 784366 | 737463 | 4 |
| 8558625 | 1070538 | 7488087 | 6878039 | 882226 | 5995812 | 5 |
| 2174783 | 1124927 | 1049856 | 1774539 | 937034 | 837505 | 6 |
| 1283484 | 425313 | 858171 | 1039640 | 348245 | 691395 | 7 |
| 1452007 | 578123 | 873884 | 1179987 | 496295 | 683692 | 8 |
| 1680015 | 922448 | 757567 | 1372453 | 765532 | 606922 | 9 |
| 1549788 | 442977 | 1106811 | 1253084 | 362346 | 890739 | 10 |
| 1359642 | 580741 | 778901 | 1105604 | 481330 | 624274 | 11 |
| 857662 | 459318 | 395334 | 700818 | 394209 | 306610 | 12 |
| 2206514 | 790243 | 1416271 | 1789789 | 663558 | 1126231 | 13 |
| 1171802 | 306272 | 865530 | 946981 | 261312 | 685670 | 14 |
| 3063059 | 575401 | 2487658 | 2468328 | 494692 | 1973636 | 15 |
| 1953341 | 327201 | 1626140 | 1572154 | 264536 | 1307618 | 16 |
| 1361211 | 353214 | 1007997 | 1100187 | 293008 | 807178 | 17 |
| 2277170 | 347707 | 1929463 | 1831560 | 275982 | 1555578 | 18 |
| 40150173 | 12097923 | 28052250 | 32489972 | 10071891 | 22418081 | Total |

Source: Ministry of Planning, Central Statistical Organization, Annual Statistical Abstract for 2013, Part Two, Population and Labor Force Statistics, Table (2), p. 11.

- Ministry of Planning, Central Statistical Organization, Annual Statistical Abstract for the year 2021, Part Two, Population and Labor Force Statistics, Table (1), p. 10.

2- Relative distribution

The study of the relative distribution of the population of any region according to the governorate is the most widespread and used method, as it shows the percentage of what afflicts the governorate from the total population. The population varies between the different administrative units, so the proportional distribution is useful in knowing the relative weight of the population for each region (Al-Najm, 2016, p. 193).

1-2 - Percentage distribution for the year 2010

From Table (3), the highest percentage of the urban population was in Baghdad Governorate, amounting to (26.7%), and the lowest percentage of the urban population was in Al-Muthanna Governorate, which amounted to (1.4%). The highest percentage of the rural population was in Nineveh Governorate, which amounted to (12.1%), and the lowest percentage The rural population is in Maysan Governorate, which is (2.6%), while the highest percentage of the Iraqi population is in Baghdad Governorate, which is (21.2%), and the lowest percentage of the Iraqi population is in Al-Muthanna Governorate, which is (2.2%), as shown in Maps (1).

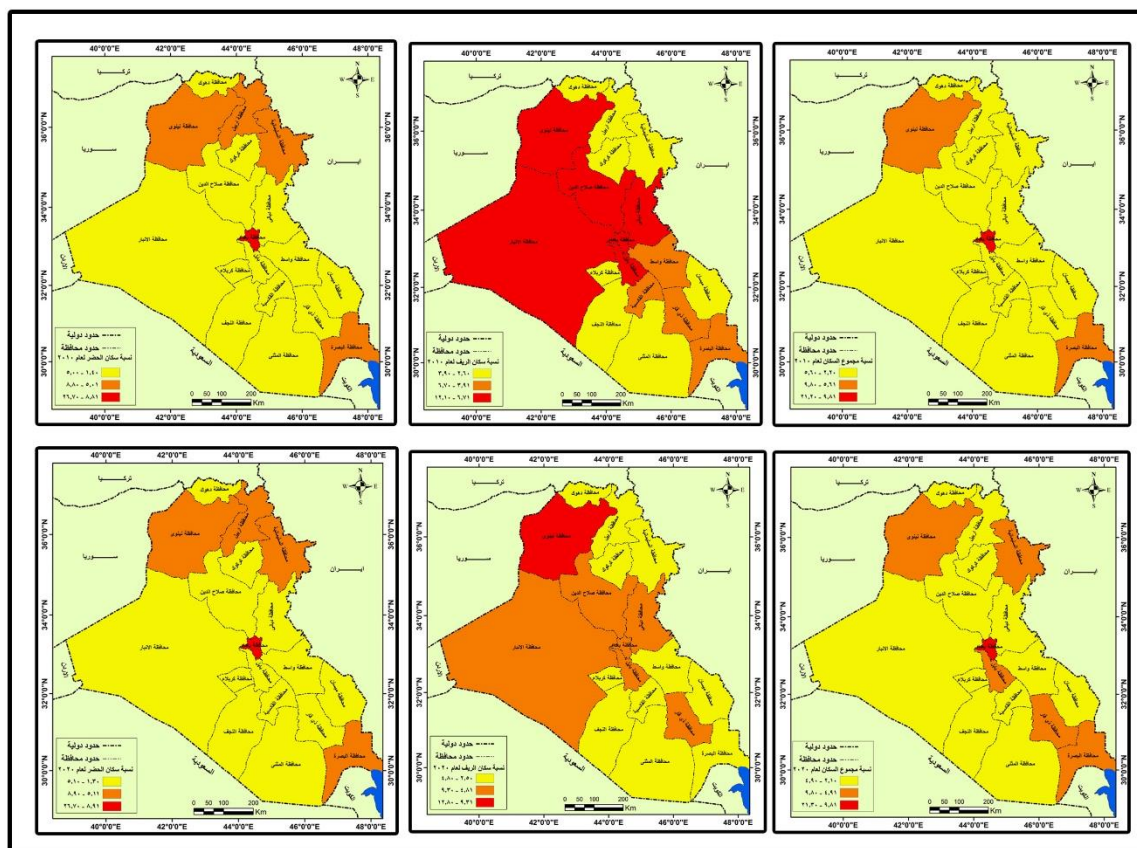
2-2 - Percentage distribution for the year 2020

From table (3), the highest percentage of the urban population was in Baghdad Governorate, which amounted to (26.7%), and the lowest percentage of the urban population was in Al-Muthanna Governorate, which amounted to (1.3%). The highest percentage of the rural population was in Nineveh Governorate, which amounted to (12.8%), and the lowest percentage of the rural population In Maysan Governorate, which is (2.5%), while at the level of Iraq, the highest percentage is in Baghdad Governorate, which is (21.3%), and the lowest percentage is in Al-Muthanna Governorate, which is (2.1%), as shown in Maps (1).

Table (3) The relative distribution of the population according to the environment in the governorates of Iraq for the years (2010 AD and 2020 AD)

| 2020 | | | 2010 | | | No. |
|------------|------------------|------------------|------------|------------------|------------------|-------|
| Population | Rural Population | Urban Population | Population | Rural Population | Urban Population | |
| 9.8 | 12.8 | 8.5 | 9.8 | 12.1 | 8.6 | 1 |
| 4.2 | 3.6 | 4.4 | 4.2 | 3.8 | 4.3 | 2 |
| 4.3 | 7.2 | 3.0 | 4.3 | 7.4 | 3.1 | 3 |
| 4.7 | 7.7 | 3.3 | 4.7 | 7.8 | 3.2 | 4 |
| 21.3 | 8.9 | 26.7 | 21.2 | 8.8 | 26.7 | 5 |
| 5.4 | 9.3 | 3.7 | 5.5 | 9.3 | 3.7 | 6 |
| 3.2 | 3.5 | 3.1 | 3.2 | 3.5 | 3.1 | 7 |
| 3.6 | 4.8 | 3.1 | 3.6 | 4.9 | 3.1 | 8 |
| 4.2 | 7.6 | 2.7 | 4.2 | 7.6 | 2.7 | 9 |
| 3.9 | 3.7 | 4.0 | 3.9 | 3.6 | 4.0 | 10 |
| 3.4 | 4.8 | 2.8 | 3.4 | 4.8 | 2.8 | 11 |
| 2.1 | 3.8 | 1.3 | 2.2 | 3.9 | 1.4 | 12 |
| 5.5 | 6.5 | 5.1 | 5.5 | 6.7 | 5.0 | 13 |
| 2.8 | 2.5 | 3.1 | 2.9 | 2.6 | 3.1 | 14 |
| 7.6 | 4.8 | 8.9 | 7.6 | 4.9 | 8.8 | 15 |
| 4.9 | 2.7 | 5.8 | 4.8 | 2.7 | 5.8 | 16 |
| 3.4 | 2.9 | 3.6 | 3.4 | 2.9 | 3.6 | 17 |
| 5.7 | 2.9 | 6.9 | 5.6 | 2.7 | 7 | 18 |
| 100 | 100 | 100 | 100 | 100 | 100 | Total |

Map (1) The relative distribution of the population according to the environment in the governorates of Iraq for the years (2010 AD and 2020 AD)



It is the change in population size during different periods of time. Population decline is negative growth and population increase is growth (The Multilingual Demographic Dictionary, p. 132). Population growth in a positive direction is one of the most prominent demographic phenomena characteristics of the modern era, as it represents an important challenge to humanity, especially developing countries whose population is increasing at a high annual rate, causing economic and social problems and pressure on natural and environmental resources (Al-Kitab, 2021, p. 32). From Table (4), the growth rate of the urban population in Iraq has reached (2.3), with Muthanna Governorate recording the highest growth rate at (2.7), and Nineveh and Sulaymaniyah governorates recording a growth rate of (2.1) for each of them, and the growth rate of the population of rural Iraq has reached (1.8). The province of Sulaymaniyah recorded the highest growth rate, which was (2.3), and the province of Kirkuk recorded the lowest growth rate, which was (1.3). Dohuk, Sulaymaniyah) has a growth rate of (2.2) for each governorate, and each of the governorates (Wasit, Salah al-Din, and Muthanna) recorded the lowest growth rate, amounting to (2.0) for each governorate, as shown in maps (2).

Table (4) The spatial distribution of the population growth rate according to the environment in the governorates of Iraq for the period (2010-2020 AD)

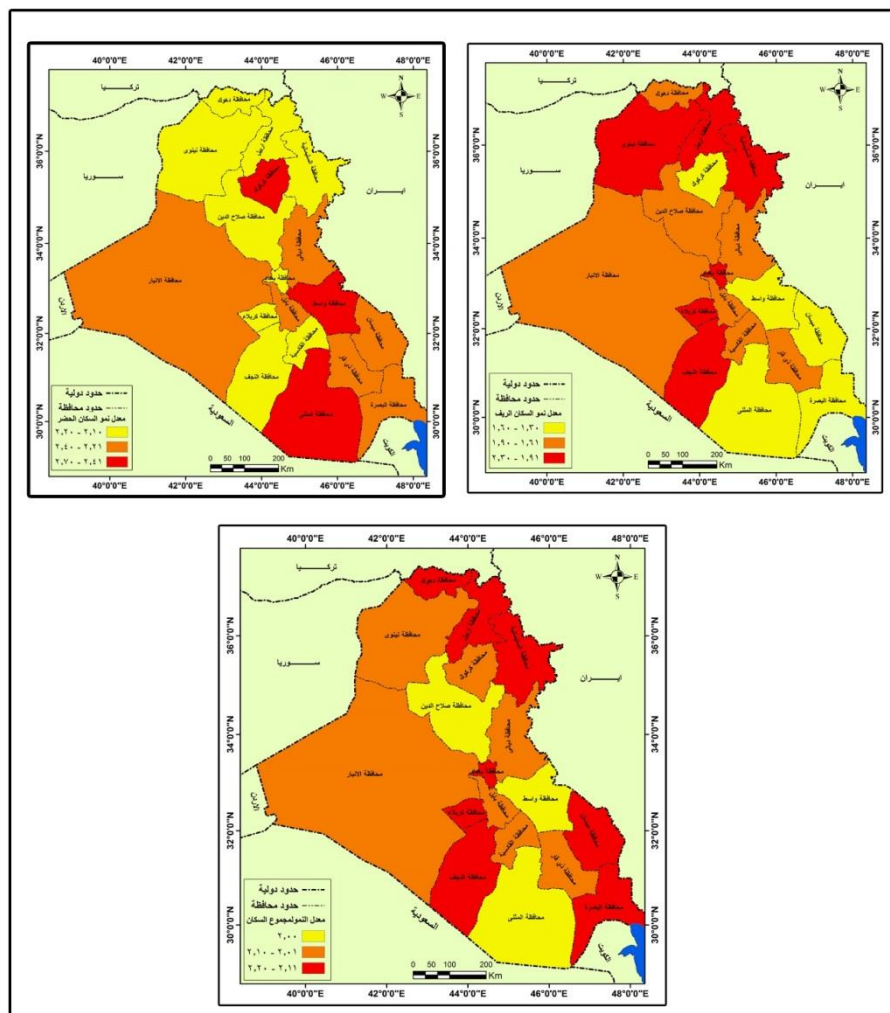
| Population | Rural Population | Urban Population | No. |
|------------|------------------|------------------|-----|
| 2.1 | 2.2 | 2.1 | 1 |
| 2.1 | 1.3 | 2.5 | 2 |
| 2.1 | 1.8 | 2.3 | 3 |
| 2.1 | 1.7 | 2.4 | 4 |
| 2.2 | 2 | 2.2 | 5 |
| 2.1 | 1.8 | 2.3 | 6 |

| | | | |
|-----|-----|-----|-------|
| 2.2 | 2 | 2.2 | 7 |
| 2.0 | 1.5 | 2.5 | 8 |
| 2.0 | 1.9 | 2.2 | 9 |
| 2.2 | 2 | 2.2 | 10 |
| 2.1 | 1.9 | 2.2 | 11 |
| 2.0 | 1.5 | 2.7 | 12 |
| 2.1 | 1.8 | 2.3 | 13 |
| 2.2 | 1.6 | 2.4 | 14 |
| 2.2 | 1.5 | 2.3 | 15 |
| 2.2 | 2.1 | 2.2 | 16 |
| 2.2 | 1.9 | 2.2 | 17 |
| 2.2 | 2.3 | 2.1 | 18 |
| 2.1 | 1.8 | 2.3 | Total |

Source: Based on Table (2) and equation:

$$r = \left(\sqrt[t]{\frac{pt}{po}} - 1 \right) \times 100$$

Where: r = growth rate, pt = last census, po = first census, t = number of years



Maps (2) The spatial distribution of the population growth rate according to the environment in the governorates of Iraq for the period (2010-2020 AD).

Future projections are the modern trend in the science of geography. Through these projections, it is possible to know the future population numbers in order to know the future development plans of building schools, hospitals, care homes and other public services such as transportation methods and housing units. These projections can be calculated through the growth rate and knowing the size of the population during a period precedent, and that future expectations may be unrealistic as the region was exposed to any exceptional circumstances such as wars, earthquakes, and other circumstances.

From Table (5), the expected population of urban Iraq for the year 2030 AD may reach (35,214,703) people, Baghdad governorate records the highest population, which may reach (9,308,502) people, and Al-Muthanna governorate records the lowest population, which may reach (519,938) people. The expected rural Iraq may reach (14,460,676) people, Nineveh Governorate records the highest population, which may reach (1921,948) people, and Erbil Governorate records the lowest population, which may reach (402,783) people, while the expected total population of Iraq for the year 2030 may reach (49,675,379)) people, Baghdad governorate records the highest population, which amounts to (10,613,481) people, and Al-Muthanna governorate records the lowest population, which may reach (1052,995) people, as shown in maps (3).

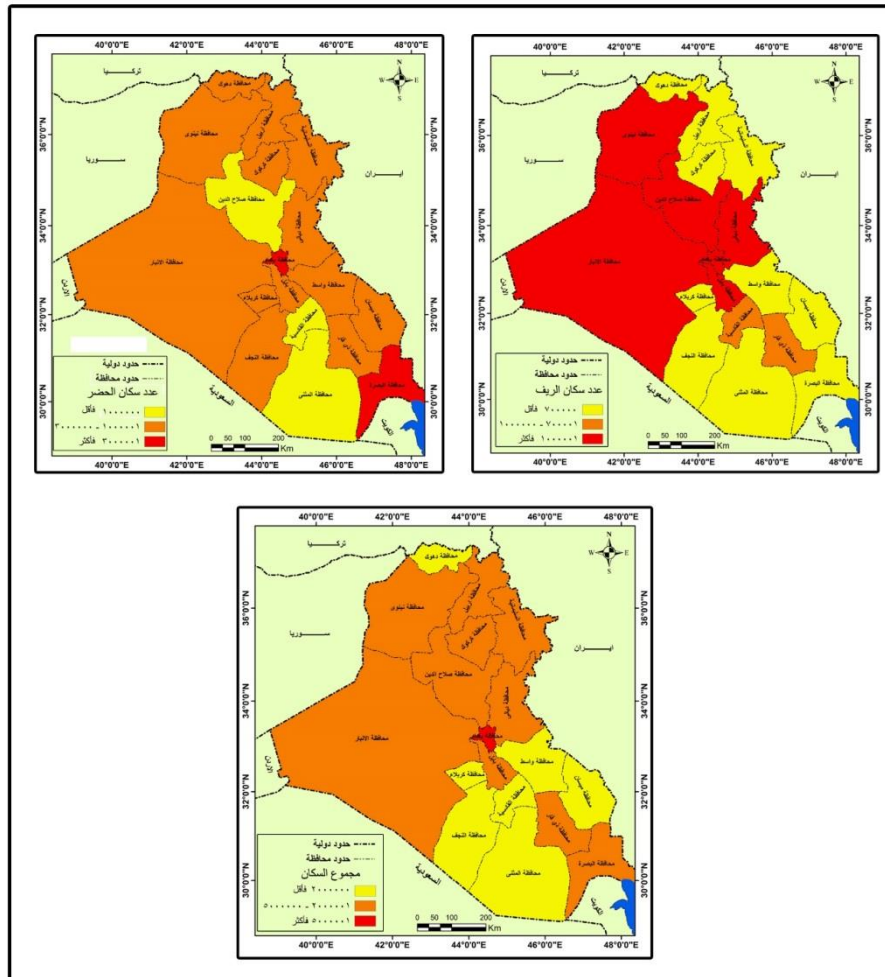
Table (5) of the future projections of the population according to the environment in the governorates of Iraq for the year 2030 AD

| Population | Rural Population | Urban Population | No. |
|------------|------------------|------------------|-------|
| 4854348 | 1921948 | 2932400 | 1 |
| 2091717 | 499445 | 1592272 | 2 |
| 2111906 | 1046951 | 1064955 | 3 |
| 2286831 | 1103838 | 1182993 | 4 |
| 10613481 | 1304979 | 9308502 | 5 |
| 2662537 | 1344627 | 1317910 | 6 |
| 1585253 | 518454 | 1066799 | 7 |
| 1789580 | 670935 | 1118645 | 8 |
| 2055220 | 1113483 | 941737 | 9 |
| 1915871 | 539986 | 1375885 | 10 |
| 1669268 | 701010 | 968258 | 11 |
| 1052995 | 533057 | 519938 | 12 |
| 2722460 | 944579 | 1777881 | 13 |
| 1645675 | 548486 | 1097189 | 14 |
| 3790596 | 667776 | 3122820 | 15 |
| 2424251 | 402783 | 2021468 | 16 |
| 1679412 | 426363 | 1253049 | 17 |
| 2811650 | 436485 | 2375165 | 18 |
| 49675379 | 14460676 | 35214703 | Total |

Source: Based on Table (5) and the following equation:

$$pn = po(1 + r)^n$$

pn = expected census, po = previous census, r = growth, n = number of years (Al-Saadi, 2002, p. 291, 203)



Maps (3) of the future projections of the population according to the environment in the governorates of Iraq for the year 2030 AD

RESULTS

- 1- The research showed that the largest area is the province of Anbar with a rate of (31.7%) of the area of Iraq, and the smallest area is the province of Baghdad with a rate of (1.0%) of the area of Iraq.
- 2- The research shows that the highest percentage of the population is in Baghdad Governorate, which is (21.2%), and the lowest percentage is in Al-Muthanna Governorate, which is (2.2%). % in Muthanna Governorate.
- 3- The research showed that the Iraqi population growth for the period (2010-2020 AD) reached (2.1), and this rate was recorded in urban areas (2.3), and in rural areas it was recorded as (1.8).
- 4- The research showed that the future projections for the population of Iraq for the year 2030 may reach (49,675,379) people, the urban population may reach (35,214,703) people, and the rural population may reach (14,460,676) people.

RECOMMENDATIONS

- 1- There must be organized and directed planning by the concerned authorities to face the large population size in some governorates to prepare plans for housing, education and other basic services.
- 2- The concerned authorities should provide an organized population policy to reduce the population growth rate, especially in the urban areas of the governorates, through seminars, conferences, and special instructions to reduce births.



3- Studies must be conducted by the concerned authorities to establish attractive projects for the population in the empty areas in order to find a balance between the population and the available resources within the governorates of Iraq.

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