

# **Sustainable Development and Demographics a Comparative Study between Urban and Rural Population According to Population Estimates for the Year 2021**

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## **Abstract**

The population study is one of the important studies which is depended on a lot in planning and decision-making, so in this research, estimates of Iraq's population for the year 2021 were used for the urban and rural regions and a comparison was made between the results of the two regions through the use of some age categories indicators such as the arithmetic mean of ages, median age, dependency ratio, the youth ratio, and aging ratio, has also been used qualitative composition indicators were used, such as the sex ratio at birth, the sex ratio to the total population, the proportion of males and the proportion of females, and The proportion of the population under the age of thirty- that category had a great role in sustainable development. The Secretariat's guide of the United Nations was used to check the accuracy of the data. Finally, using the urban and rural population pyramid to determine the population pattern.

In this research, conclusions are shown that youth of the Iraqi society, and more than two-thirds of the Iraqi society is under the age of thirty, and accordingly, the state must employ its capabilities in order to provide the requirements of a decent life for this category, especially since most of the conflicts that occur in the world were from countries have such category. The conclusions also showed the accuracy of urban data and its reliability in the areas of planning and decision-making, while showing the

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inaccuracy of rural data, according to the United Nations secretariat's guide.

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## **I. Introduction:**

Population censuses are the main tributary to providing researchers with population data that is very reliable to make appropriate decisions regarding planning, education and health. So, in this research, estimates of Iraq's population for the year 2021 were used for urban and rural areas to make a comparison between the two regions using indicators of sex and age structure, and knowledge of the pattern of Iraqi society, which are of interest to the state to develop future plans, as well as to know the number of the population under the age of thirty due to the prominent and effective role of this group in the areas of development, and the United Nations Secretariat's guide was used to classify the accuracy of the data.

## **II. Theoretical Side**

### **II.I Age Structure<sup>3,4,5</sup>:**

The age structure is one of the most important indicators used in the demography, through which the productive power of the population is identified and whether the population is young or old, in addition to many other uses that are included in the field of planning, health, agriculture, and others. The age structure affects the size of the labor force, consumption pattern, and the population's economic and social needs. Its results are important indicators when charting economic and social development because of their impact on development opportunities and play a major role in security and governance challenges.

Through the age structure of the population, we can have a conception of the shape of society, where the decrease in the number of children under the age of fifteen and the increase in the number of young of working age leads to a reduction in the dependency ratio and opens the door to economic development for the entry of a large number of the population into the labor force, and this Economic growth cannot take place without drawing up real economic policies inside the country that guarantee the entry of this number of young people to the labor market through the development of the education system and the eradication of illiteracy that Iraqi society suffers from as a result of a large percentage of children and youth dropping out of school at an early age. The state should involve young people in serious training courses to provide them with real professional skills that will allow them to enter the labor market. Also, caring for the youth segment under the age of thirty by providing them with job opportunities and ensuring their education with good

education closes the door to internal conflicts and civil wars that may arise within the country, as it is approximately 80% of the conflicts and civil strife that occurred in the world since the seventies of the last century to At the end of the second millennium, 60% of the population was under the age of thirty in societies.

Society can be divided according to age into four age structures which are:

1. The very young age structure: in which two-thirds of the population or more are under 30 years of age.
2. Age structure of youth: in which more than 60% of the population is under the age of 30.
3. The transitional age structure: where (45 - 60) percent of the population is under the age of 30.
4. Mature age structure: less than 45% of the population is under the age of 30 and up to a quarter of the population is over the age of 60.

## II.II Numerical indicators of the age structure<sup>1</sup>:

The age structure has many important indicators that are relied upon to determine whether the society is young or old, and these indicators include: the arithmetic mean of ages, median age, dependency ratio, youth ratio, and aging ratio.

**i. Arithmetic Mean of Ages:** It is the weighted arithmetic mean of ages by population.

$$\bar{X} = \frac{\sum_{i=1}^n x_i P_i}{P_i} \quad \dots (1)$$

where:

$x_i$ : Center of age category  $i$ .

$P_i$ : The number of people in the age category  $i$ .

**ii. Median Age:** It is the age that divides the total population into two equal parts so that half of the population exceeds the median age and the other half is less than it. The increase in the median age has many reasons, the most important of which is the decrease in mortality rates. According to the median age, societies with a high median age (greater than 30 years) are described as aged societies, societies with a low median age (less than 25 years) are described as young societies, and societies with a moderate median age (between 25 and 30 years) are described as societies Mature.

$$Me = Lm + \frac{\frac{P}{2} - CP}{Pm} \times c \quad \dots (2)$$

Where:

$Me$ : Median age.

$Lm$ : Minimum of the median category.

$P$ : The population.

$P_m$ : The frequency of the median category.

$CP$ : The previous cumulative frequency of the median category.

$c$ : The length of the median category.

**iii. Dependency Ratio:** The dependency ratio relates the number of children (0-14 years old) plus older persons (65 years or over) to the working-age population (15-64 years old)

$$DR = \frac{P_{0-14} + P_{65-}}{P_{15-64}} \times 100\% \quad \dots (3)$$

Where:

$DR$ : dependency ratio.

$P_{0-14}$ : The number of young people under 15 years of age.

$P_{65-}$ : The number of older persons (65 years or over).

$P_{15-64}$ : The number of people of working age (i.e. 15-64).

$$DR_{min} = \frac{P_{0-14}}{P_{15-64}} \times 100\% \quad \dots (4)$$

Where:

$DR_{min}$ : The youth dependency ratio.

$P_{0-14}$ : The number of young people under 15 years of age.

$P_{15-64}$ : The number of people of working age (i.e. 15-64).

$$DR_{max} = \frac{P_{65-}}{P_{15-64}} \times 100\% \quad \dots (5)$$

Where:

$DR_{max}$ : The old-age dependency ratio.

$P_{65-}$ : The number of older persons (65 years or over).

$P_{15-64}$ : The number of people of working age (i.e. 15-64).

**iv. Youth Ratio:** It represents the ratio of the population under 15 years of age to the total population, and it is a measure of the increase or decrease in the rates of reproduction and a reflection of the population growth rate.

$$YR = \frac{P_{0-14}}{P} \times 100\% \quad \dots (6)$$

Where:

$YR$ : Youth Ratio (children under 15 years old).

$P_{0-14}$ : The number of young people under 15 years of age.

$P$ : The population.

**v. Aging Ratio:** It represents the ratio of the population out of working age aged 65 years and over, and the increase of this ratio indicates an increase in the aging or hierarchy of society.

$$OR = \frac{P_{65-}}{P} \times 100\% \quad \dots (7)$$

Where:

$OR$ : The agingRatio.

$P_{65-}$ : The number of older persons (65 years or over).

$P$ : The population.

### II.III Sex Structure <sup>2</sup>:

Sex structure is one of the most important demographic indicators used in planning. It measures the ratio between the numbers of males per hundred females. This ratio at birth is 105 males to 100 females and decreases with age so that every ten centenarians include 8 women. The sex ratio is a demographic criterion used by statisticians to ensure the accuracy of the results of population censuses, as the data show that the ratio at birth is in the range of 102% - 107% and does not change except within a few limits, and it is variable as it begins with the increase of males over females in the first years of life and then decreases due to the difference Mortality rates for both sexes, and in the middle age categories approach moderation, to decline in the old years due to the increase in the number of females over males due to deaths as well as internal and external migrations and wars.

The most important indicators of the sexstructure of the population:

$$SR_0 = \frac{MP_{0-1}}{FP_{0-1}} \times 100\% \quad \dots (8)$$

Where:

$SR_0$ : Sex ratio at birth.

$MP_{0-1}$ : The number of male children under 1 year.

$FP_{0-1}$ : The number of female children under 1 year.

$$SR_x = \frac{MP_x}{FP_x} \times 100\% \quad \dots (9)$$

Where:

$SR_x$ : Sex ratio at age x to x+4.

$MP_x$ : The number of males at age x to x+4.

$FP_x$ : The number of females at age  $x$  to  $x+4$ .

$$SR = \frac{MP}{FP} \times 100\% \quad \dots (10)$$

Where:

$SR$ : The sex ratio of the total population.

$MP$ : The number of males for the total population.

$FP$ : The number of females for the total population.

$$FR = \frac{FP}{P} \times 100\% \quad \dots (11)$$

Where:

$FR$ : The female ratio.

$FP$ : The number of females.

$P$ : The population.

$$MR = \frac{MP}{P} \times 100\% \quad \dots (12)$$

Where:

$MR$ : The maleratio.

$MP$ : The number of males.

$P$ : The population.

#### II.IV Age Ratio <sup>2</sup>:

It is the ratio of the number of people in a certain age category to the average number of people in the two neighboring age categories (previous and subsequent) and it is calculated for all categories except for the first and last for both sexes. It is calculated as follows:

$$AR_x = \frac{P_x}{\frac{(P_{x-5} + P_{x+5})}{2}} \times 100\% \quad \dots (13)$$

Where:

$AR_x$ : the age ratio at age  $x$ .

$P_x$ : the number of people at age  $x$ .

$P_{x-5}$ : the number of people in the age  $x-5$ .

$P_{x+5}$ : the number of people in the age  $x+5$ .

## II.VUN Age - Sex Accuracy Index<sup>5</sup>:

It is one of the measures used in evaluating the data and it depends on three indicators: gender ratio, age ratio for males, and age ratio for females, it is calculated as follows:

$$ASAI = 3SRS + ARS_m + ARS_f \quad \dots (14)$$

Where:

*ASAI*: Age- Sex Accuracy Index.

*SRS*: Average of the absolute deviations between each of two categories of sex ratio.

*ARS<sub>m</sub>*: Average absolute deviations of the age ratio for males from 100.

*ARS<sub>f</sub>*: Average absolute deviations of the age ratio for females from 100.

According to this scale, the accuracy of the data is according to the following classifications:

Indicator value	Data quality level
Less than 20	high accuracy and can be trusted
20 – 40	medium accuracy
More than 40	not very accurate and cannot be trusted

## II. VI General Fertility Rate:

It is the ratio of total live births to the number of females of childbearing age.

$$GFR = \frac{B}{W_{15-45}} \times k \quad \dots (15)$$

Where:

*GFR*: general fertility rate.

*B*: the number of live births.

*W<sub>15-45</sub>*: Number of females of childbearing age.

*k* : a constant with a value of 1000 or 100000 at most.

## II. VII Population pyramid:

A population pyramid is a pyramid-shaped diagram used to represent the sex and age distribution of the population. There are three types of populations that we can observe through the shape of the population pyramid:

1. Expansive population pyramid.
2. Stationary, or near stationary, population pyramid.
3. Constrictive population pyramid.

The society which has the expansive pyramid characterizes a high percentage of the population under the age of 20 years, where this category constitutes 40-50%, and a decrease in the percentage of the population over the age of 64 years, where this category constitutes less than 10%.

As for a society in which the population pattern is moderate, it is characterized by high birth rates and low death rates, an increase in the proportion of the population of working age (20-64) years of the total population, and the population pyramid of this society is characterized by a relatively narrow base and high vertical sides.

As for a society in which the population pattern is decreasing (pyramid), it is characterized by a decrease in the proportion of the young population under the age of 20 years, and an increase in the proportion of the population in the high age 60 years and over, and is characterized by a small base due to low births and a wide peak of low death rates as a result of economic, health and social development with Widening at the center of the pyramid, and these societies tend to age, as the average lifespan of individuals increases, especially in advanced societies.

### **III. The application:**

This research was based on the data of population estimates for the year 2021 for the urban and rural regions, which were obtained from the Ministry of Planning / Central Statistical Organization. Where the population indicators that were previously discussed for both regions (urban and rural) were applied, according to appendix (1) the following is the most important finding of the research:

We note from appendix (1) that the cumulative number of males under the age of 15 is 5,694,938, while the cumulative number of females is 5,379,622 out of the total urban population of 28,779,201, where this category constitutes 38%, or more than one-third of the urban population within the category of children under five Ten and this affects the youth of society, as the cumulative number of children under two years of age reached 1,562,422, and this requires the state to be prepared for real in its five-year plans and to allocate a large part of its resources in the field of education and to build schools to accommodate these numbers.

While the cumulative number of males under the age of 30 reached 9,778,990 compared to 9,257,659 for females of the total urban population, meaning that more than two-thirds of the urban population are young people under the age of thirty, which have an effective role in the development if the state is able to make the best use of it by providing Real education and creating job opportunities that guarantee them a decent life, especially since this group is the most effective and motivated if left without serious care.



As for the population aged 65 years and over, it reached 960,001, and this group constituted 3%, which is a small percentage compared to the size of the urban population.

**Table (1) Sex and age ratio of urban population by five-year age groups for the year 2021**

Age categories	Male	Female	Total	sex ratio	Age ratio for males	Age ratio for females	Age ratio for Total
0 – 4	2,075,034	1,963,130	4,038,164	106	—	—	—
5 – 9	1,909,774	1,817,261	3,727,035	105	101	102	101
10 – 14	1,710,130	1,599,231	3,309,361	107	99	97	98
15 – 19	1,541,120	1,471,953	3,013,073	105	99	101	100
20 – 24	1,412,094	1,320,158	2,732,252	107	106	103	104
25 – 29	1,130,838	1,085,926	2,216,764	104	94	94	94
30 – 34	986,385	996,744	1,983,129	99	100	101	101
35 – 39	840,611	878,473	1,719,084	96	95	98	96
40 – 44	787,620	804,310	1,591,930	98	109	107	108
45 – 49	606,217	619,577	1,225,794	98	104	98	101
50 – 54	379,608	456,438	836,046	83	75	87	81
55 – 59	412,861	427,692	840,553	97	125	112	118
60 – 64	279,665	306,350	586,015	91	93	98	95
65 – 69	190,097	197,599	387,696	96	94	92	93
70 – 74	124,612	125,204	249,816	100	98	91	94
75 – 79	65,093	77,148	142,241	84	66	66	66
80 -	72,326	107,922	180,248	67	—	—	—
<b>Total</b>	14,524,085	14,255,116	28,779,201	102			

Using the numbered equations (8, 9, 10, 13) we note from Table (1) that the gender ratio was high in the first groups of the population as a result of the increase in the number of males versus females, as it ranged between (104 - 107) and this percentage began to decline in age groups after the age of thirty as a result of the increase in the number of females versus males due to the increase in male deaths in these age groups or because of wars and migrations. The maximum decrease in

the sex ratio reached after the age of eighty, where every hundred female correspond to 67 males, meaning that every ten urban centenarians, among them approximately 7 females.

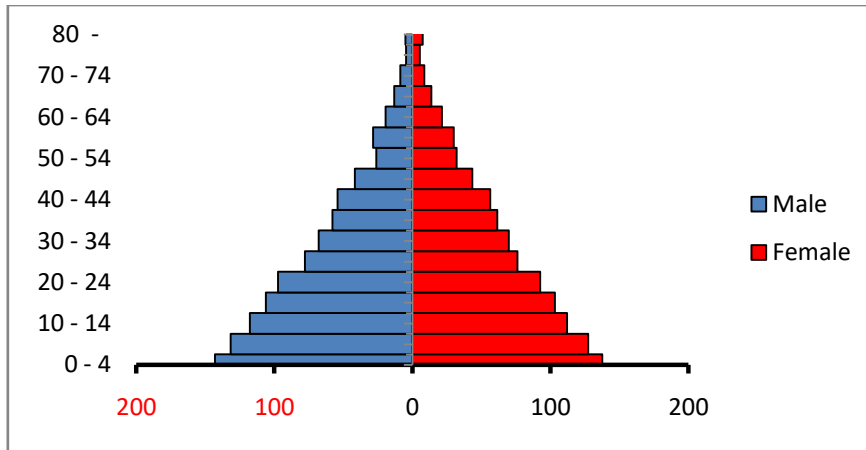
We also note the clear fluctuation in the age ratio for males and females and for the total population. Perhaps one of the reasons for this fluctuation is the inaccuracy in recording real population data.

When applying the data accuracy index proposed by the United Nations (Equation No. 14), we find that this evidence has reached 33.6, and this means that the estimated data is accurate to some extent and its results can be relied upon.

**Table (2) some indicators of the age structure by sex of the urban population in Iraq for the year 2021**

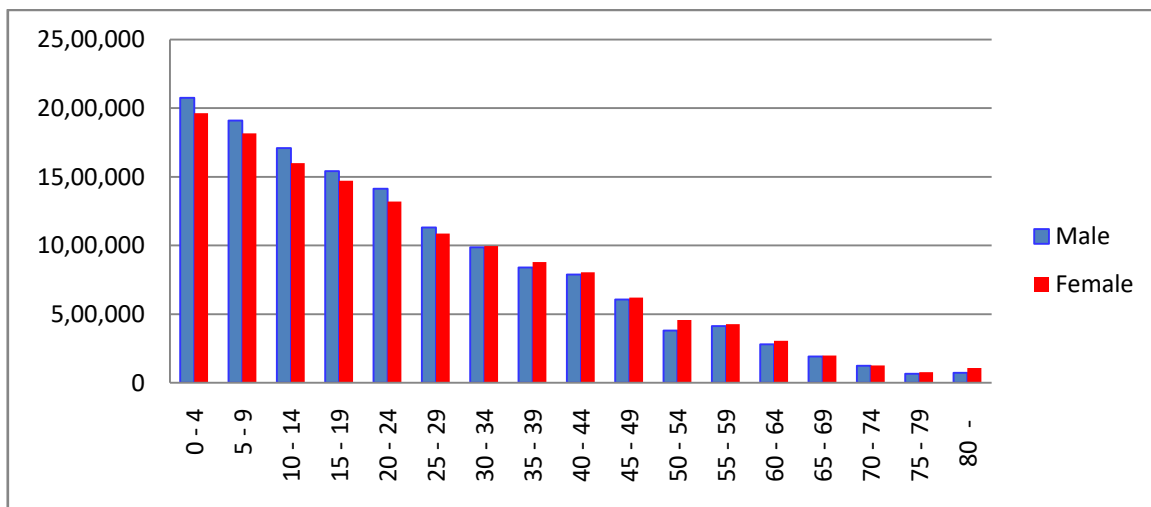
Index	Male	Female	Total
Arithmetic Mean	23.7	24.7	24.1
Median age	19.4	20.4	20.1
Dependency ratio	72%		
Minimum Dependency Ratio	66%		
Great Dependency Ratio	6%		
Youth ratio	38%		
Old ratio	3%		
Fertility rate	11.4%		
Female ratio	49.5%		
Male ratio	50.5%		

Through Table (2) and by using the numbered equations (1-7, 11,12,15), we note that the arithmetic means of the ages of males was 23.7 years, while that of females reached 24.7 years, and this reflects the higher ages of females than males, while the median age for males was 19.4 and for females 20.4, which is evidence of the youthfulness of the urban community, and the value of the dependency ratio was 72% This means that the percentage of children and the elderly is 72 for every hundred people of working age, and the percentage of bullying is 38%, which is a high percentage indicating that the urban society is a young society, while the percentage of females in the urban area reached 49.5% compared to 50.5% for males.



**Graph(1) the population pyramid of urban Iraq according to the estimates of the year 2021**

We note through Figure (1) the widening of the base of the pyramid as a result of the increase in the number of births and children under the age of five with a gradual, balanced decrease on both sides of the pyramid. From the shape of the population pyramid, we note that the urban society is a young society.



**Graph(2) The age distribution of urban Iraq according to the estimates for the year 2021**

Through Graph(2) we notice a gradual decrease in the population numbers according to age, where the highest level is in the first age category(0-4 years) and continues to decrease until it reaches its lowest level in the category of equal and greater than 75.

According to Appendix (2) we note that the number of males under the age of 15 years reached 2,890,919, while the number of females reached 2,702,917 out of the total rural population of

12,411,457, and this category constitutes 45% of the rural population, and this reflects the youthfulness of the community.

The cumulative number of males under 30 years of age reached 4,616,226 compared to 4,312,973 females of the total rural population, meaning that more than 71% of the rural population are young people under the age of thirty, which have an active role in development.

As for the population aged 65 years and over, it reached 306,707, and this group constituted 2%, which is a small percentage compared to the size of the rural population.

**Table (3) the percentage of gender, age and cumulative frequency of the rural population according to the five-year age groups for the year 2021**

Age categories	Male	Female	Total	sex ratio	Age ratio for males	Age ratio for females	Age ratio for Total
4 – 0	1,027,555	977,906	2,005,461	105	—	—	—
9 – 5	985,748	908,480	1,894,228	109	103	101	102
14 – 10	877,616	816,531	1,694,147	107	102	103	103
15 – 15	729,376	673,284	1,402,660	108	101	101	101
24 – 20	571,207	510,218	1,081,425	112	99	93	96
29 – 25	424,724	426,554	851,278	100	90	93	91
34 – 30	375,725	404,965	780,690	93	101	105	103
39 – 35	320,390	345,571	665,961	93	94	97	96
44 – 40	307,193	305,131	612,324	101	117	109	113
49 – 45	202,885	213,544	416,429	95	100	96	98
54 – 50	97,458	137,649	235,107	71	59	78	69
59 – 55	129,479	139,858	269,337	93	135	117	125
64 – 60	93,831	101,872	195,703	92	101	103	102
69 – 65	55,766	58,526	114,292	95	86	85	85
74 – 70	35,778	36,213	71,991	99	95	87	91
79 – 75	19,395	24,658	44,053	79	57	61	59
- 80	32,268	44,103	76,371	73	—	—	—
<b>Total</b>	<b>6,286,394</b>	<b>6,125,063</b>	<b>12,411,457</b>				

Using the numbered equations (8, 9, 10, 13) we note from Table (3) that the gender ratio was high in the first groups of the population as a result of the increase in the number of males versus females, as it ranged between (105-112) and this percentage began to fluctuate in the later age groups, as the maximum decrease in the percentage of gender reached after the age of eighty, as it corresponds to every hundreds of the females, 73 are males, meaning that every ten centenarians in the countryside, including approximately 7 females.

We also note the clear fluctuation in the age ratio for males and females and for the total population. Perhaps one of the reasons for this fluctuation is the inaccuracy in population estimates.

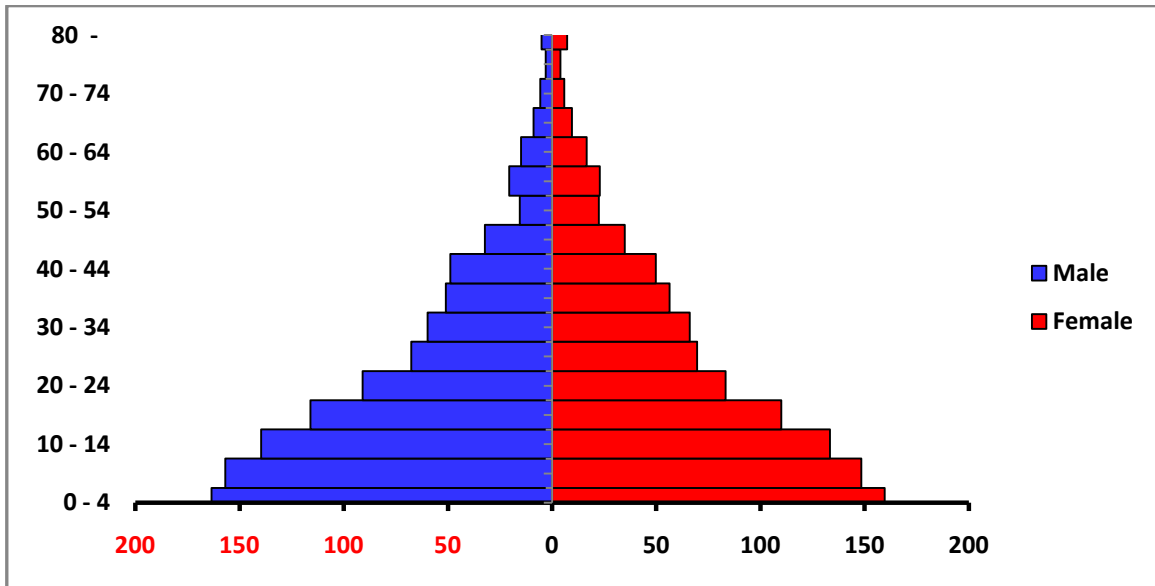
When applying the data accuracy index proposed by the United Nations (Equation No. 14), we find that the value of the evidence has reached 44.6, which means that rural data are inaccurate and their results cannot be relied upon.

**Table (4) Some indicators of the age structure by sex of the rural population in Iraq for the year 2021**

Index	Male	Female	Total
Arithmetic Mean	20.8	22.0	21.4
Median age	17.6	18.5	18.4
Dependency ratio	91%		
Minimum Dependency Ratio	86%		
Great Dependency Ratio	5%		
Youth ratio	45%		
Old ratio	2%		
Fertility rate	13.3%		
Female ratio	0.49		
Male ratio	0.51		

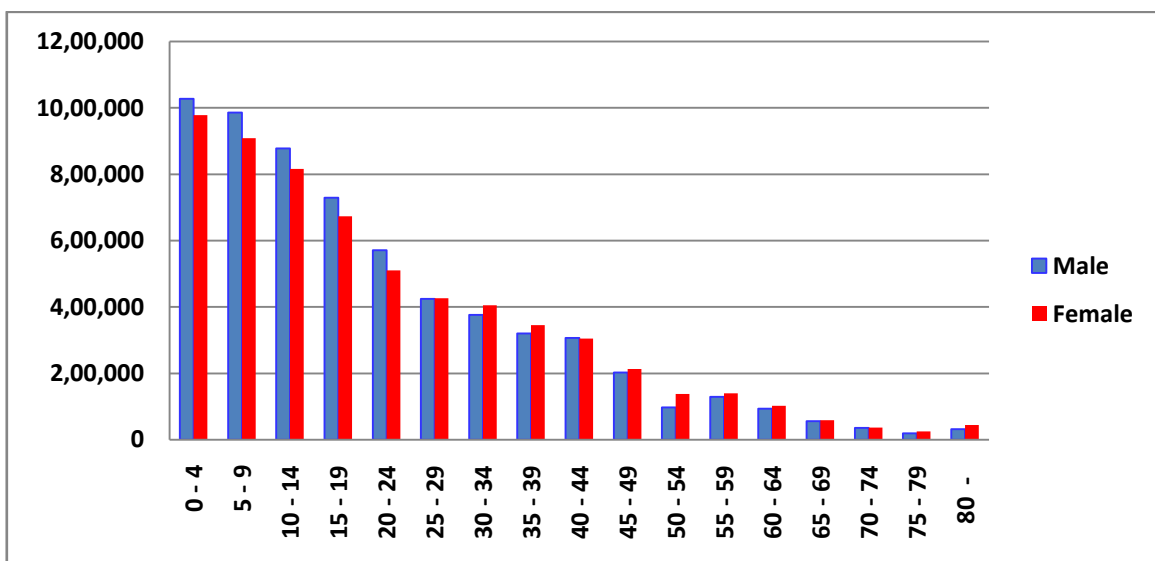
Through Table (4) and by using the numbered equations (1-7, 11,12,15), we note that the arithmetic means of male ages was 20.8 years, while for females it was 22 years, and this reflects the higher age of females than males, while the median age for males was 17.6 and for females 18.5. This reflects that the rural community is a young society, and the value of the dependency ratio is 91 This reflects that the percentage of children and the elderly is 91 for every hundred people of working age, and the percentage of bullying reached 45%, which is a high percentage

indicating that the rural community is a young society, while the percentage of females in the rural area reached 49% compared to 51% for males.



**Graph(3) The population pyramid of rural Iraq according to the estimates for the year 2021**

We note in graph (3) the widening of the base of the pyramid as a result of the increase in the number of births and children under the age of five with a gradual, balanced decrease on both sides of the pyramid. From the shape of the population pyramid, we note that the rural community is a young society.



**Graph(4) The age distribution in the countryside of Iraq according to the estimates for the year 2021**

Through Figure (4), we notice a gradual decrease in population numbers according to age, where the highest level is in the first age category (0-4 years) and continues to decrease until it reaches its lowest level in the category of 75 and more.

**Table (5) Comparison of urban and rural results in Iraq for the year 2021**

Index	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Arithmetic Mean	23.7	24.7	24.1	20.8	22.0	21.4
median age	19.4	20.4	20.1	17.6	18.5	18.4
Dependency ratio	73%	70%	72%	93%	88%	91%
Maximum Dependency Ratio	68%	64%	66%	89%	83%	86%
Minimum Dependency Ratio	5%	6%	6%	4%	5%	5%
Youth ratio	39%	38%	38%	46%	44%	45%
Old ratio	3%	4%	3%	2%	3%	2%
Fertility rate	0.114			0.133		
Male ratio	0.505			0.506		
Female ratio	0.495			0.494		

We note from Table (5) when comparing the results of urban and rural residents that the arithmetic means and the median age of the urban area is higher than it is in the rural area, and this may be due to the improvement of the health and service reality in the urban than in the countryside. While the dependency ratio and the percentage of bullying in the countryside were higher, as a result of the higher rate of births in the countryside than in the urban areas. While the rate of aging in urban areas was higher as a result of the increase in the proportion of the elderly in urban areas than in the countryside, and this may be due to the improvement in the service and health reality in urban areas.

**Table (6) Percentages of the three age groups from the total population**

Age category	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0 – 29	24%	22%	46%	11.2%	10.5%	22%	35%	33%	68%
30 – 64	10%	11%	21%	4%	4%	8%	14 %	15%	29%

more than 65	1%	1%	2%	0.3%	0.4%	1%	1%	2%	3%
<b>Total</b>	35%	35%	70%	15%	15%	30%	51%	49%	100%

We note from Table (6) that the percentage of males who are less than 30 years old in urban areas has reached 24% of the total population, while the percentage of females has reached 22%, which is a high percentage compared to what is found in the countryside due to the concentration of the majority of the population in cities and migration from rural areas. Where the ratio reached 11.2% for males compared to 10.5% for females, and in total, the percentage of the population under the age of thirty reached 68% of the total population, which is a high percentage that can be relied upon for the development of the country, especially if this segment of the population is successfully employed and the correct means of education are provided. Many conflicts occur as a result of the rush of young people (from 17-29 years old) due to the lack of adequate and appropriate living conditions for a free and dignified life for them.

**Table (7): Percentages of the three age groups from the region to which they belong**

Age category	Urban			Rural		
	Male	Female	Total	Male	Female	Total
0 – 29	%34	%32	%66	%37	%35	%72
30 – 64	%15	%16	%31	%12.3	%13.3	%25.6
more than 65	%2	%2	%3	%1	1%	%2
<b>Total</b>	%51	%49.6	%100	%51	%49	%100

We note from Table (7) that the percentage of males who are less than 30 years old reached 34% of the urban population compared to 37% in the countryside of the same age, while females in urban areas 32% compared to 35% in the countryside as a result of the large number of births in the countryside compared to the population of In urban areas, while we find that with advanced ages, the percentages increase in the urban compared to the countryside as a result of the improvement in the health situation in the cities compared to the countryside.

And based on the results of tables (8 and 9), governments should pay attention to the youth segment of the population by providing means of education, health and other recreational activities



such as sports, arts and music to unload their energies and invest them in the right investment to keep pace with the wheel of development and progress, especially since the most conflicts and conflicts in the world are the result of disruption and neglect of the energies of This important segment of the population and the lack of proper utilization of their energies in the areas of human development.

#### **IV. Conclusions:**

The research reached a number of conclusions, the most important of which is:

1. The urban and rural populations are characterized by a young society
2. More than two-thirds of the Iraqi population is young people under the age of thirty, which have a prominent and effective role in the areas of sustainable development.
3. The rural data is not accurate enough to be fully relied upon to make appropriate decisions in the areas of planning,

And one of the most important recommendations of the research is the need to pay attention to the youth category, and the possibility of exploiting them towards human sustainability and economic development of the country, as they are the main pillar for building a sustainable economic power, especially since many statistics indicate that more than 80% of the conflicts that occurred around the world were from societies with the majority of the population of them young.

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### Appendix

#### Appendix (1) Estimates of the urban population in Iraq and the cumulative frequency by sex and single age categories for the year 2021

Age	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
0	379,691	368,200	747,891	379,691	368,200	747,891
1	422,387	392,144	814,531	802,078	760,344	1,562,422
2	427,914	404,259	832,173	1,229,992	1,164,603	2,394,595
3	433,507	401,603	835,110	1,663,499	1,566,206	3,229,705
4	411,535	396,924	808,459	2,075,034	1,963,130	4,038,164
5	400,189	380,339	780,528	2,475,223	2,343,469	4,818,692
6	397,860	382,307	780,167	2,873,083	2,725,776	5,598,859
7	385,546	369,980	755,526	3,258,629	3,095,756	6,354,385
8	371,685	353,126	724,811	3,630,314	3,448,882	7,079,196
9	354,494	331,509	686,003	3,984,808	3,780,391	7,765,199
10	344,466	327,849	672,315	4,329,274	4,108,240	8,437,514
11	358,042	326,631	684,673	4,687,316	4,434,871	9,122,187
12	366,557	344,486	711,043	5,053,873	4,779,357	9,833,230
13	324,551	310,194	634,745	5,378,424	5,089,551	10,467,975
14	316,514	290,071	606,585	5,694,938	5,379,622	11,074,560
15	325,979	308,548	634,527	6,020,917	5,688,170	11,709,087
16	307,073	297,069	604,142	6,327,990	5,985,239	12,313,229
17	298,328	283,444	581,772	6,626,318	6,268,683	12,895,001
18	312,280	297,515	609,795	6,938,598	6,566,198	13,504,796
19	297,460	285,377	582,837	7,236,058	6,851,575	14,087,633
20	290,211	274,397	564,608	7,526,269	7,125,972	14,652,241
21	283,576	257,913	541,489	7,809,845	7,383,885	15,193,730
22	310,097	289,163	599,260	8,119,942	7,673,048	15,792,990
23	276,418	258,192	534,610	8,396,360	7,931,240	16,327,600
24	251,792	240,493	492,285	8,648,152	8,171,733	16,819,885

Age	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
25	238,492	222,731	461,223	8,886,644	8,394,464	17,281,108
26	233,800	222,235	456,035	9,120,444	8,616,699	17,737,143
27	229,782	229,252	459,034	9,350,226	8,845,951	18,196,177
28	214,351	209,485	423,836	9,564,577	9,055,436	18,620,013
29	214,413	202,223	416,636	9,778,990	9,257,659	19,036,649
30	213,219	208,818	422,037	9,992,209	9,466,477	19,458,686
31	192,149	198,578	390,727	10,184,358	9,665,055	19,849,413
32	208,563	205,739	414,302	10,392,921	9,870,794	20,263,715
33	191,245	193,330	384,575	10,584,166	10,064,124	20,648,290
34	181,209	190,279	371,488	10,765,375	10,254,403	21,019,778
35	176,422	179,138	355,560	10,941,797	10,433,541	21,375,338
36	173,565	180,424	353,989	11,115,362	10,613,965	21,729,327
37	170,504	178,129	348,633	11,285,866	10,792,094	22,077,960
38	161,765	168,978	330,743	11,447,631	10,961,072	22,408,703
39	158,355	171,804	330,159	11,605,986	11,132,876	22,738,862
40	168,787	179,457	348,244	11,774,773	11,312,333	23,087,106
41	153,668	162,336	316,004	11,928,441	11,474,669	23,403,110
42	170,662	166,847	337,509	12,099,103	11,641,516	23,740,619
43	150,110	148,522	298,632	12,249,213	11,790,038	24,039,251
44	144,393	147,148	291,541	12,393,606	11,937,186	24,330,792
45	124,939	128,243	253,182	12,518,545	12,065,429	24,583,974
46	129,120	121,567	250,687	12,647,665	12,186,996	24,834,661
47	127,703	131,481	259,184	12,775,368	12,318,477	25,093,845
48	116,673	122,686	239,359	12,892,041	12,441,163	25,333,204
49	107,782	115,600	223,382	12,999,823	12,556,763	25,556,586
50	102,463	117,965	220,428	13,102,286	12,674,728	25,777,014
51	80,275	88,578	168,853	13,182,561	12,763,306	25,945,867
52	80,913	102,001	182,914	13,263,474	12,865,307	26,128,781
53	62,670	77,254	139,924	13,326,144	12,942,561	26,268,705
54	53,287	70,640	123,927	13,379,431	13,013,201	26,392,632
55	93,822	87,270	181,092	13,473,253	13,100,471	26,573,724

Age	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
56	82,002	78,491	160,493	13,555,255	13,178,962	26,734,217
57	85,434	97,002	182,436	13,640,689	13,275,964	26,916,653
58	79,214	90,220	169,434	13,719,903	13,366,184	27,086,087
59	72,389	74,709	147,098	13,792,292	13,440,893	27,233,185
60	68,049	82,460	150,509	13,860,341	13,523,353	27,383,694
61	59,480	59,999	119,479	13,919,821	13,583,352	27,503,173
62	71,943	79,705	151,648	13,991,764	13,663,057	27,654,821
63	47,525	50,883	98,408	14,039,289	13,713,940	27,753,229
64	32,668	33,303	65,971	14,071,957	13,747,243	27,819,200
65	51,429	57,813	109,242	14,123,386	13,805,056	27,928,442
66	34,775	31,735	66,510	14,158,161	13,836,791	27,994,952
67	42,795	53,019	95,814	14,200,956	13,889,810	28,090,766
68	25,671	25,078	50,749	14,226,627	13,914,888	28,141,515
69	35,427	29,954	65,381	14,262,054	13,944,842	28,206,896
70	34,624	31,457	66,081	14,296,678	13,976,299	28,272,977
71	24,104	22,865	46,969	14,320,782	13,999,164	28,319,946
72	28,175	31,255	59,430	14,348,957	14,030,419	28,379,376
73	23,617	23,522	47,139	14,372,574	14,053,941	28,426,515
74	14,092	16,105	30,197	14,386,666	14,070,046	28,456,712
75	20,137	31,841	51,978	14,406,803	14,101,887	28,508,690
76	10,350	9,318	19,668	14,417,153	14,111,205	28,528,358
77	9,421	16,920	26,341	14,426,574	14,128,125	28,554,699
78	14,633	9,513	24,146	14,441,207	14,137,638	28,578,845
79	10,552	9,556	20,108	14,451,759	14,147,194	28,598,953
80	72,326	107,922	180,248	14,524,085	14,255,116	28,779,201
Total	14,451,759	14,147,194	28,598,953			

**Appendix (2) Estimates of the rural population in Iraq and the cumulative ascending frequency by gender and single age groups for the year 2021**

Age categories	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
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Age categories	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
0	182,614	173,228	355,842	182,614	173,228	355,842
1	204,518	199,370	403,888	387,132	372,598	759,730
2	216,020	200,714	416,734	603,152	573,312	1,176,464
3	212,723	201,591	414,314	815,875	774,903	1,590,778
4	211,680	203,003	414,683	1,027,555	977,906	2,005,461
5	203,752	190,725	394,477	1,231,307	1,168,631	2,399,938
6	202,185	184,219	386,404	1,433,492	1,352,850	2,786,342
7	197,928	183,946	381,874	1,631,420	1,536,796	3,168,216
8	194,961	181,635	376,596	1,826,381	1,718,431	3,544,812
9	186,922	167,955	354,877	2,013,303	1,886,386	3,899,689
10	182,938	165,495	348,433	2,196,241	2,051,881	4,248,122
11	178,138	166,023	344,161	2,374,379	2,217,904	4,592,283
12	183,289	168,416	351,705	2,557,668	2,386,320	4,943,988
13	171,259	163,041	334,300	2,728,927	2,549,361	5,278,288
14	161,992	153,556	315,548	2,890,919	2,702,917	5,593,836
15	157,978	150,938	308,916	3,048,897	2,853,855	5,902,752
16	148,096	139,420	287,516	3,196,993	2,993,275	6,190,268
17	146,442	136,062	282,504	3,343,435	3,129,337	6,472,772
18	143,090	129,208	272,298	3,486,525	3,258,545	6,745,070
19	133,770	117,656	251,426	3,620,295	3,376,201	6,996,496
20	130,673	116,732	247,405	3,750,968	3,492,933	7,243,901
21	117,933	102,231	220,164	3,868,901	3,595,164	7,464,065
22	125,687	109,574	235,261	3,994,588	3,704,738	7,699,326
23	101,338	93,786	195,124	4,095,926	3,798,524	7,894,450
24	95,576	87,895	183,471	4,191,502	3,886,419	8,077,921
25	87,885	85,045	172,930	4,279,387	3,971,464	8,250,851
26	85,390	86,373	171,763	4,364,777	4,057,837	8,422,614
27	91,186	90,531	181,717	4,455,963	4,148,368	8,604,331
28	82,730	84,565	167,295	4,538,693	4,232,933	8,771,626

Age categories	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
29	77,533	80,040	157,573	4,616,226	4,312,973	8,929,199
30	80,316	88,312	168,628	4,696,542	4,401,285	9,097,827
31	71,554	75,150	146,704	4,768,096	4,476,435	9,244,531
32	80,344	88,320	168,664	4,848,440	4,564,755	9,413,195
33	74,050	77,893	151,943	4,922,490	4,642,648	9,565,138
34	69,461	75,290	144,751	4,991,951	4,717,938	9,709,889
35	65,988	70,038	136,026	5,057,939	4,787,976	9,845,915
36	64,608	68,630	133,238	5,122,547	4,856,606	9,979,153
37	66,474	75,249	141,723	5,189,021	4,931,855	10,120,876
38	60,898	67,753	128,651	5,249,919	4,999,608	10,249,527
39	62,422	63,901	126,323	5,312,341	5,063,509	10,375,850
40	68,044	70,234	138,278	5,380,385	5,133,743	10,514,128
41	58,414	60,101	118,515	5,438,799	5,193,844	10,632,643
42	68,640	67,246	135,886	5,507,439	5,261,090	10,768,529
43	56,896	52,459	109,355	5,564,335	5,313,549	10,877,884
44	55,199	55,091	110,290	5,619,534	5,368,640	10,988,174
45	45,855	47,070	92,925	5,665,389	5,415,710	11,081,099
46	45,510	41,779	87,289	5,710,899	5,457,489	11,168,388
47	42,883	46,598	89,481	5,753,782	5,504,087	11,257,869
48	37,528	40,690	78,218	5,791,310	5,544,777	11,336,087
49	31,109	37,407	68,516	5,822,419	5,582,184	11,404,603
50	29,860	38,666	68,526	5,852,279	5,620,850	11,473,129
51	19,814	26,506	46,320	5,872,093	5,647,356	11,519,449
52	23,135	33,522	56,657	5,895,228	5,680,878	11,576,106
53	13,477	20,017	33,494	5,908,705	5,700,895	11,609,600
54	11,172	18,938	30,110	5,919,877	5,719,833	11,639,710
55	26,752	23,257	50,009	5,946,629	5,743,090	11,689,719
56	24,540	24,649	49,189	5,971,169	5,767,739	11,738,908
57	29,388	36,130	65,518	6,000,557	5,803,869	11,804,426

Age categories	Male	Female	Total	$F_i$ Male	$F_i$ Female	$F_i$ Total
58	25,981	29,722	55,703	6,026,538	5,833,591	11,860,129
59	22,818	26,100	48,918	6,049,356	5,859,691	11,909,047
60	23,651	26,547	50,198	6,073,007	5,886,238	11,959,245
61	18,254	20,053	38,307	6,091,261	5,906,291	11,997,552
62	25,150	27,925	53,075	6,116,411	5,934,216	12,050,627
63	16,847	17,495	34,342	6,133,258	5,951,711	12,084,969
64	9,929	9,852	19,781	6,143,187	5,961,563	12,104,750
65	16,058	18,881	34,939	6,159,245	5,980,444	12,139,689
66	9,040	7,179	16,219	6,168,285	5,987,623	12,155,908
67	13,954	18,136	32,090	6,182,239	6,005,759	12,187,998
68	6,896	6,058	12,954	6,189,135	6,011,817	12,200,952
69	9,818	8,272	18,090	6,198,953	6,020,089	12,219,042
70	10,555	11,505	22,060	6,209,508	6,031,594	12,241,102
71	6,793	5,385	12,178	6,216,301	6,036,979	12,253,280
72	8,947	10,443	19,390	6,225,248	6,047,422	12,272,670
73	5,814	5,447	11,261	6,231,062	6,052,869	12,283,931
74	3,669	3,433	7,102	6,234,731	6,056,302	12,291,033
75	6,337	11,652	17,989	6,241,068	6,067,954	12,309,022
76	2,183	2,573	4,756	6,243,251	6,070,527	12,313,778
77	4,130	5,862	9,992	6,247,381	6,076,389	12,323,770
78	3,909	2,259	6,168	6,251,290	6,078,648	12,329,938
79	2,836	2,312	5,148	6,254,126	6,080,960	12,335,086
80	32,268	44,103	76,371	6,286,394	6,125,063	12,411,457
Total	6,286,394	6,125,063	12,411,457			