Journal of Namibian Studies, 33 S1(2023): 605–620 ISSN: 2197-5523 (online)

The of anthropogenous factors on the (Baghdad - Kirkuk) road

Huda Abdel-kadir Aziz[1], Dr. Jamal Hamid Rashid[2]

[1]College of Arts, Geography dep. and Geographic information system, The Iraqia University, drhudaaziz07@gmail.com

[2]Geography dep., College of Education-Ibn Rushd of human sciences, University of Baghdad, jamaalhameed77@gmail.com

Abstract

This research aims to highlight the role of anthropogenous factors on the highway of the study area (Baghdad-Kirkuk road), because this highway has a strategic importance. It is a link artery between the capital, Baghdad, and the northern governorates. The population density according to the study districts is (241.46) people per linear kilometer of the road, while the study showed that the large population density of the urban population per linear kilometer included the Kirkuk district, was 4329.9, for the large population density of the rural population per linear kilometer. It included the district of Khalis, which amounted to (1018.7), and the study also showed the effect of the highway and its role in increasing the number of daily trips resulting from the presence of many areas and religious shrines. This road is important and it has a great effect on economic agricultural, industrial and tourism activities.

Introduction

The effect of anthropogenous factors is no less important than the effect of natural factors, in determining the routes of highway networks, specifications and media that are used and the extent of their effect on movement. They determine the locations and sizes of the nodes, which require studying the effect of urban centers and their growth, as well as their economic activities. This is one of the reasons for the growth of highway networks because this area has a large population and a large volume of traffic , which require the expansion of roads to accommodate the density of traffic(Muhammad, 2017).

The research aims to study the effect of anthropogenous factors on the highway of the study area (Baghdad-Kirkuk).

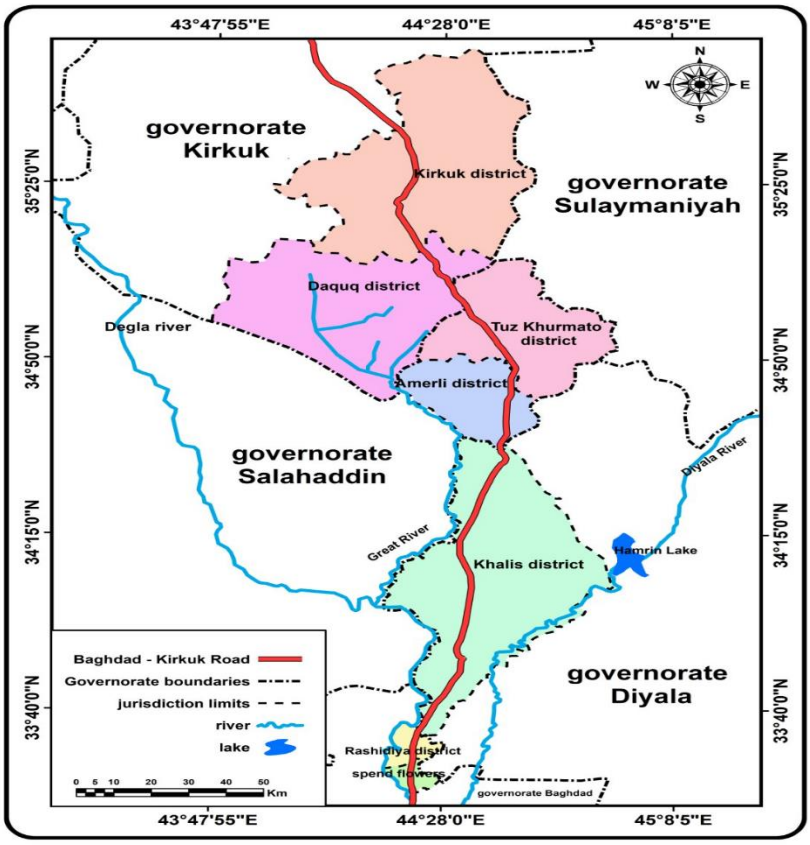
The research problem appears in asking: Do anthropogenous factors have an effect on the way of the study area (Baghdad-Kirkuk)?

Search Limits: -

The location of the study area, Baghdad Highway – Kirkuk No. (2) connects the capital, Baghdad, with the provinces (Diyala – Saladin - Kirkuk). The astronomical location of the study area is Baghdad Highway – Kirkuk between the two latitudes (33o 24'' 29.927'') and (35o 29' 44.64 '') north and longitude (44o 22' 1.658'') and (44 o23' 30.477'') to the east, and the length of the highway is (255) km map (1).

The temporal Limits are since the construction of the highway until 2023.

Map 1 Study Area (Baghdad-Kirkuk) Road



(Ministry of Water Resources, 2020)

Background

Population growth is considered one of the most important demographic phenomena in modern times. It represents one of the important challenges in the developing countries whose population exceeds the rate of economic development. Population growth is

related to the amount of natural increase, that is, the difference between the number of births and the number of deaths. The importance of population growth in determines the amount of population increase in the future, and then estimates the population in the coming years, which depends mainly on census data or vital statistics(Fayyad, 2022). The population growth of the governorates is located on the highway to the study area as follows:

1- Population growth of Baghdad Governorate: -

Baghdad Governorate is one of the major governorates, in which the population is increasing, due to the presence of many service and educational departments and institutions. There are also health institutions. Also, the population of Baghdad governorate reached (3917266) in 1987, at a rate of (23.9%) of the population of Iraq, amounting to (16,335,199) people. Then, the population increased as it reached (5423964) people in 1997, at a rate of (24.6%). The population of Iraq was with a growth rate of (3.3%) for the years (1987-1997), while in 2008 the population of the province reached (7092624) people, with a growth rate of (2.5%) for the years (1997-2008), with a rate of (23.1%) of the population of Iraq The amount is (30680190) people, and in 2020 the population of the governorate reached (8558625) people, at a rate of (27.9%) of the population of Iraq, amounting to (40150173) people, with a growth rate of (1.7%). Also, the post-2003 events and the deterioration of the security situation, terrorist bombings, kidnappings and displacement contributed to the instability of the population for a long time after witnessing a significant improvement in the security level Table (1).

2- Diyala Governorate population growth :-

The population of Diyala Governorate reached (961073) people in 1987, a percentage of (5.8%) of the Iraqi population of (16335199) people. Then, the population increased in 1997, reaching (1135223) people and a percentage of (5.1%) of the Iraqi population of (2208627) people, with a low growth rate of (1.7%) for the years (1987-1997), and it is due to the unjust siege imposed and the poor economic level of the population. In 2008, the population of the governorate reached (1347368) and a percentage of (4.4%) of the Iraqi population of (3068090), while the growth rate was (1.6%) for the years (1997-2008). The low growth rate is due to the events of 2003 and beyond, and the accompanying deterioration of the security situation and terrorist operations in the governorate. It was forced displacements that affected most of the families living in the governorate. In 2020, the population of the governorate reached (17248) and a percentage of (4.2%) of the Iraqi population (4031750), while the growth rate witnessed a slight increase (2.1-20%), which was due to the improvement in the security situation and stability of the governorate.

3-population growth of Saladin Governorate: -

The population of Saladin reached (610140) people in 1987 and (4.4%) of the population of Iraq and (16335199) people. Then, the population increased to (944458) people in 1997 and (4.3%) of the population of Iraq and (22086270) people with a growth rate of (4.5%) for the years (1987-1997). The high growth rate is due to the prevalence of rural nature in the province and encouragement of increased childbearing, giving the state priority to the province in terms of services. In 2008, the population of the province reached (1175027) with a percentage of (3.8%) of the population of Iraq and (30680190) people, at a low growth rate of (2. 0%).It is due to the deterioration of security conditions in the province after the events, as well as the terrorist operations, bombings and displacement witnessed by the province. In 2020, the population increased to 1680015 and by 4.2% of the population of Iraq and (40350117) and a growth rate of (3.0%).

4-Population growth of Kirkuk Governorate: -

The population of Kirkuk Governorate was (601,219), at a rate of (3.7%) of the population of Iraq in 1987, amounting to (16335199) people, while the population increased in 1997 to (753171) people, at a rate of (3.4%) of the population of Iraq, amounting to (22086270).) people. Yet, the growth rate was (2.3%) for the years (1987-1997), and the decline in the growth rate is due to the same reasons, as the unjust blockade led to a decline in living standards, and the deterioration of health conditions and other services. In 2008, the population increased to (1149129) people, a rate of (3.7%) of the population of Iraq, which is (30680190) people. The growth rate increased to (3.9%), while the population of the governorate reached (16828809) people in 2020, at a rate of (3.7%). with a growth rate of (3.2%) for the years (2008-2020) due to the stability of the security situation in the governorate. Another reason is the encouragement of young people to early marriage causing high growth rates in the governorate.

Table 1 Population numbers and growth rate for the period (1997-2020) in the study area

Governorate:	census		growth rate	census	growth rate
	1987	1997		2008	
Baghdad	3917266	5423964	3.3	70926621	2.5
Diyala	961073	1135223	1.7	1347368	1.6
Kirkuk	601219	753171	2.3	1149129	3.9
Ṣalāḥ al-Dīn	610140	944458	4.5	1175027	2.0

Governorate:	census		Growth rate
	2008	2020	
Baghdad	70926621	8558625	1.6
Diyala	1347368	1724238	2.1
Kirkuk	1,149,129	1682809	3.2
Ṣalāḥ al-Dīn	1175027	1680015	3.0

(Republic of Iraq Ministry of Planning and Development Cooperation, 1997, 2020b)

• The growth rate was calculated according to the following equation(Al-Janabi, 2017): -

$$r = \sqrt[n]{(PT/PO)} * 100$$

Here

r = annual population growth rate

PT = population in subsequent census

PO = Population at previous census

n= the number of years between the two censuses(Ahmad, 2010).

Second: Population density

The relationship between transport and population is close, as it characterized by overlap. There is a direct relationship between the lengths of roads and the distribution and density of the population. Population density also controls the volume of highway traffic. The work on the construction and expansion of highway networks leads to an increase in the population in those areas. Also, the population density, according to the estimates of the population of the districts located along the geographical location of the Baghdad-Kirkuk highway for 2020, varies from one district to another. The general average population density of (241.46) people per linear kilometer of the highway has been divided into three categories as follows:

1- The first category (368.37-4550.14) Km2:- It included the districts with a large population density, which are the districts of Al-Zuhur and Al-Rashidiya.

2- The second category (109.21-368.36) Km2: - It included the districts with medium population densities, namely: Al-Khalis, Tuz Khurmatu and Kirkuk districts.

3- The third category (67.18-109.20) Km2:- It included districts with low population densities, including Amerli and Daquq al-Jaddol districts (2) and map (2).

Table 2 Population density according to the districts of the study area (Baghdad-Kirkuk) highway for the year 2020

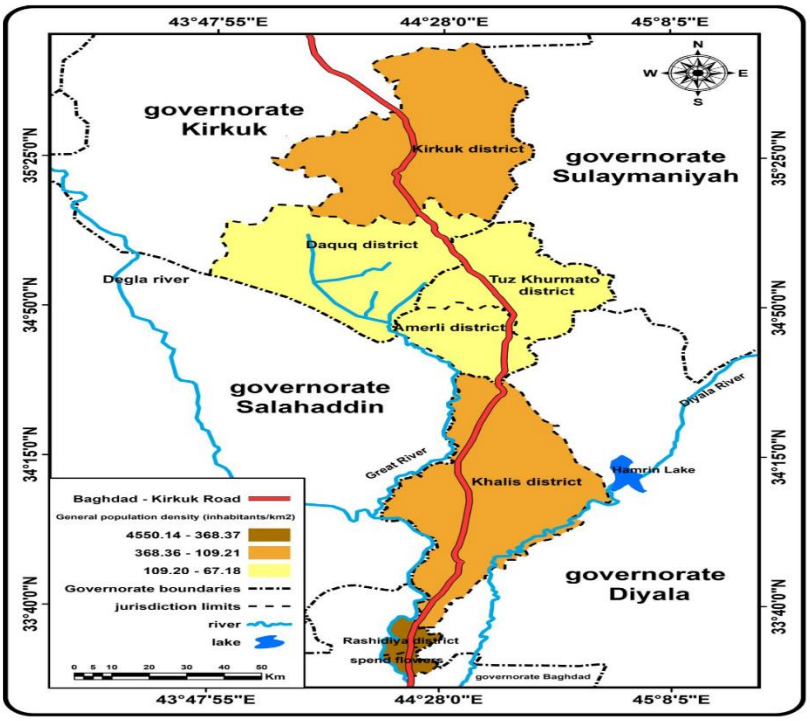
No.	The judiciary	Net Area (km^2)	population (P)	Density* Population /^{km2}
1	Al zuhour	50.48	229691	4550.14
2	Rashidiya	68.70	79395	1155.67
3	Al khalis.	2319.74	368536	158.87
4	Amraly	726.82	48825	67.18
5	Tuz Khurmatu	1450	158339	109.2
6	Daqouq	1174.08	100166	85.31
7	Kirkuk	3255.55	1199228	368.36
Total		9045.37	2184180	241.46

(Cooperation, 2020; Republic of Iraq Ministry of Planning, 2021; Republic of Iraq Ministry of Planning and Development Cooperation, 2020b)

- The density rate was extracted according to the following equation: -

General density = the population of the district / area of the district

Map 2 Population density according to the districts of the study area for 2020



The source of the researcher's work is based on: -

1- Data contained in Table (11) .

2- Arc Map Output 10.4.1.

Third : - Environmental distribution of the population (urban /rural): -

The geographical distribution of the population is witnessing great changes. After what was tending to be stable, it has become a dynamic phenomenon characterized by permanent change. The relations that are semi-stable, which existed between urban and rural areas, there was a kind of ecological balance in the distribution , which began to suffer from the imbalance resulting from the change in relations that constitute the structure of the framework(Abdul-Aziz, 2017),It caused by a natural increase in the rural population, and is absorbed from urban areas at all times and in the form of migrations , especially to major cities such as the capital because of the availability of services, employment and investment opportunities. Urban areas with high population density are also indicators that determine the size of movement and the type of trip , as well as an indicator to attract roads towards them, especially when they are administratively located, resulting in density in the movement of roads. Through the study area and through the analysis of the density of both urban and rural populations on and through the data of table (3), the density of the urban population has been divided as follows: -

1-The first category (877.7-4329.9) km 2 :- It included the large population density of the urban population per kilometer longitudinal of the highway and included the Kirkuk district. The percentage of the urban population reached (92.1%) of the total population of the district. Oil, as well as other industrial activities, helped provide job opportunities(Abdul-Aziz, 2017).

2-The second category (164.6-877.6) km2: - The average urban population density per km long of the highway included the districts of Al-Zuhur, Al-Khalis, and Tuz Khurmatu. The percentage of the urban population in Al-Zuhur district was (97.4%), while the percentage of the urban population in Tuz Khurmatu district was (77.5%), due to the presence of many industrial activities, including in Tuz Khurmatu district such as plaster and block factories. The presence of cello and gas filling plants are located on the left side of the study area highway and the secondary highway (Tuz-Tikrit)(Al-Bayati, 2014).

3- The third category (57.7-164.5) km 2 :-It included the low population density of urban areas per kilometer longitudinal road, and included both the districts of Al-Rashidiyah, Amerli and Daquq, as the percentage of the urban population in the district of Al-Rashidiya reached (52. 8%).The district of Amerli reached (30.1%), while it was

in Daquq (25.7%). %). It is due to the fact that the majority of their population is from the countryside and works to practice agricultural activity.

As for the density of the rural population, it was divided as follows:-

1- The first category (373.0-1018.7)km2:- It included the large population density of the countryside per kilometer long for the highway and included the district of Al-Khalis. The percentage of the rural population reached (70.4%), and it is due to the high percentage of agricultural land in the district. It reached (70%), where the district enjoys the availability of water such as the Diyala River and the Great, so agriculture is the important source of its population(Al-Zubaidi, 2021). It increased movement on the highway to transport agricultural products to the rest of the districts and governorates.

2- The second category (146.9-372.9) km2:- It included the average population density of the rural population per km long of the highway and included both Daquq and Kirkuk districts, and the percentage of the rural population in Daquq district reached (74.3%). Yet, the percentage of the rural population in Kirkuk district reached (7.9%).It provides many agricultural areas as well as the presence of many irrigation projects, which helped to provide water for many large agricultural areas, as well as roads, including the study area road, which contributed significantly to the transfer of agricultural crops(Al-Jumaili, 2020).

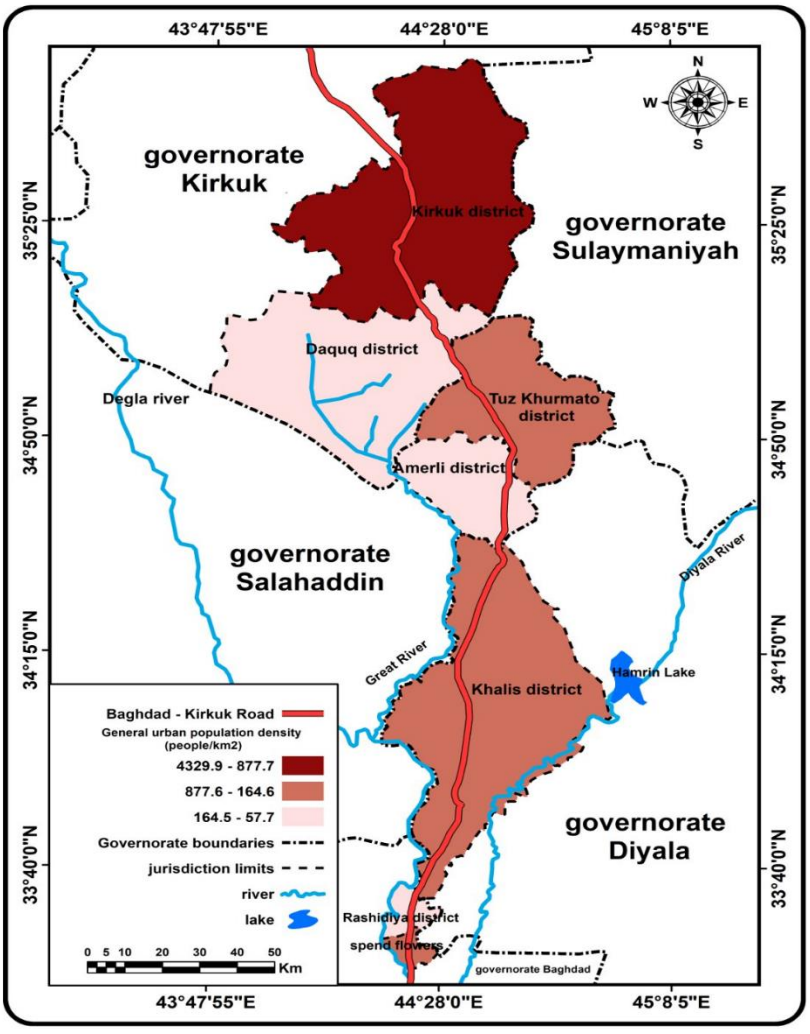
3- The third category (146.8-23.2) km2:- It included the low density of the rural population per linear kilometer on the highway and included both Al-Zuhur and Al-Rashidiya district, Amerli and Tuz Khurmatu. The percentage of the rural population in both Al-Zuhur district (2.6%) and Al-Rashidiya (47.2%), while in Amerli district their percentage was (69.9%) and in Tuz Khurmatu (22.5%).It is due to the practice of most of the residents of those districts other activities besides agricultural activity(Aziz, 2022) as in Table(3), Map(3) and Map(4).

Table 3 Population density (urban-rural) by districts along the Baghdad-Kirkuk highway for the year 2020(Republic of Iraq Ministry of Planning and Development Cooperation, 2020a)

Judiciary	Population Urbanization	Population The countryside	Total	Urban%	Rural %	Total Length Road	population density Urban Population/ km	Population density Countryside * Population/ km
Al zuhour	223779	5912	229691	97.4	2.6	255	877.6	23.2
Al-Rashidiya	41937	37458	79395	52.8	47.2	255	164.5	146.8
Al khalis	108770	259766	368536	29.5	70.4	255	426,5	1018.7

Emerald.	14708	34117	48825	30.1	69.9	255	57.7	133.8
Tuz Khurmatu	122663	35676	158339	77.5	22.5	255	481	139,9
Daquq	25694	74472	100166	25.7	74.3	255	100.7	292.0
Kirkuk	1041281	95100	1199228	92.1	7.9	255	403.3	372.9

Map 3 Population density of urban population according to the districts of the study area for the year 2020

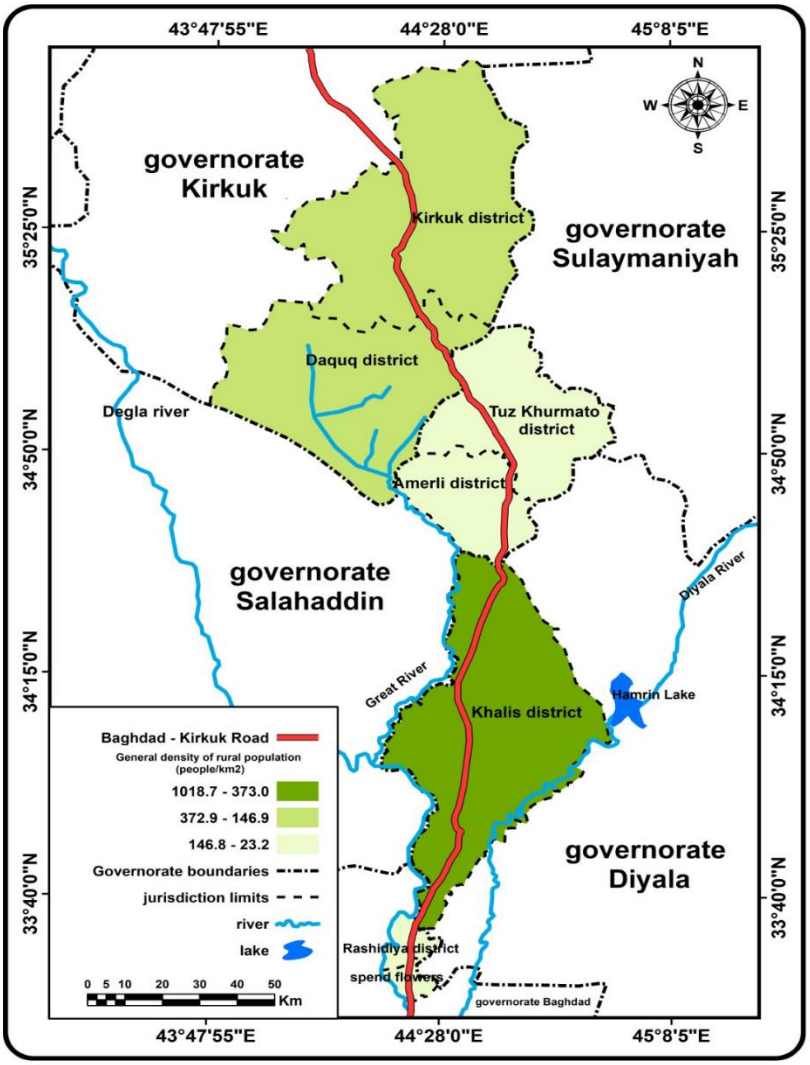


Source: - From the researcher's work based on: -

1. Table (3) data.

2. Arc Map Output 10.4.1

Map 4 The population density of the rural population according to the districts of the study area for the year 2020



Source: - From the researcher's work based on :

1- Table (3) data.

2- Output from Arc Map 10.4.1.

Results and Discussion: -

The importance of transportation systems and their role in economic activity is highlighted. There is a close relationship and mutual dependence between them. These systems link all branches of

economic activities among themselves. The economic importance of transportation shows how the means of transportation are used to achieve any significant development and change in the economy of the region or country(Allam, 2009). As transportation is important in the process of economic construction of society, through the ease of use of natural and human resources available wherever they are(Rasul, 1986). The study of the economic structure of the highway in the study area will determine the importance of the highway and its role in the economic activity of industrial, agricultural and tourism activity.

1- Agricultural activity: -

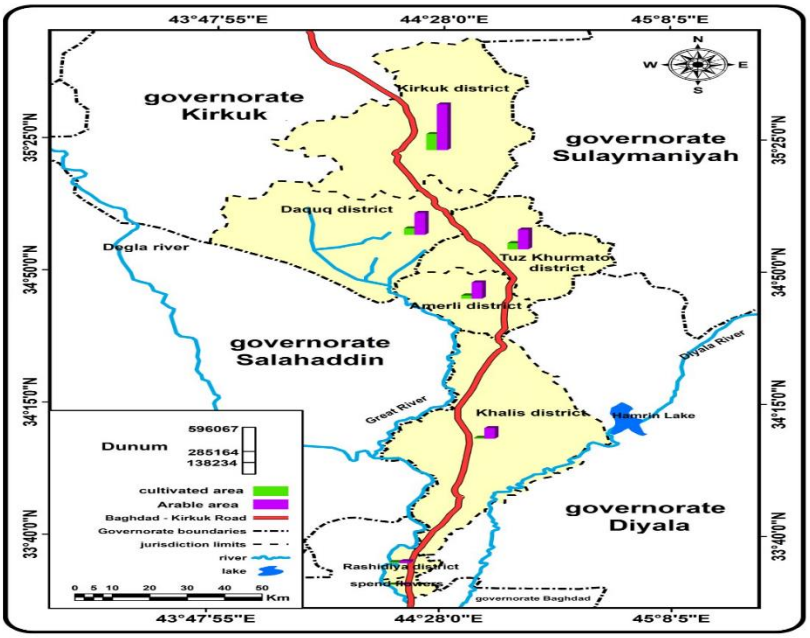
Highway networks and their efficiency affect the agricultural activities. The availability of efficient transportation methods helps to exploit agricultural land, and work to transfer products to their marketing places. It also expands the marketing of products and provides inputs to the agricultural process such as seeds, fertilizers and agricultural machinery. Transportation is one of the most important anthropogenous factors affecting the uses of agricultural land, as it provides means of transport at low prices, helps to deliver the product in less time and achieve the greatest possible profits, that is, there is an integrated spatial relationship between them(Al-Sarhan, 2009). The agricultural activity of the study area reached (2702175.7) acre, while the total area cultivated was (446364) acre, or (16.5%) of the total area, and the area suitable for agriculture amounted to (1516557) acre, or (56.1%) of the total area. The district of Kirkuk and its sub-districts amounted to (7) sub-districts in the first place recorded (39.9%) of the total area suitable for agriculture. This is because the district has good agricultural land. Also, there is a diversity of summer crops, including winter crops, such as the cultivation of wheat, barley, maize and summer vegetables, and the district of Daquq came in second place with (19.2%) of the total area suitable for agriculture. In addition, the district is famous for cultivating wheat crop as well as summer fruits(Al-Jubouri, 2018) and vegetables. Also, the third place was the district of Tuz Khurmatu, It is known for cultivating both wheat and barley crops, especially on the lands close to the highway of the study area, as well as sunflower and sesame crops(Al-Bayati, 2014), while the lesser flowers spend (0.4%) of the total area suitable for agriculture due to its predominance in urban character and lack of agricultural land. Through the above, we note that there are many agricultural areas located along the path of the study area, in which farmers transfer their agricultural products to the nearby districts and sub-districts, which leads to an increase in the intensity of traffic on the road. So, the agricultural activity has a key role in the transport system. Also, the transport has a role in developing and activating the agricultural reality of the districts and sub-districts located on the highway of the study area seen in Table (4) and Map (5).

Table 4 Agricultural and arable areas according to the districts (study area) for the year 2021

No.	Judge	Area (Acre)	Planted area	Area valid Agriculture	%
1	Al-Zuhur	20192	5330	5630	0.4
2	Al-Rashidiya	68.70	11658	23722	1.5
3	Al Khalis	231895	11305	138234	9.1
4	Amerli	290728	43958	211523	13.9
5	Tuz Khurmatu	362015	80000	256217	16.8
6	Daquq	500509	84544	285164	18.8
7	Kirkuk	1296768	209569	596067	39.3
Total		2702175.7	446.364	1516557	100

(Ministry of Planning, 2021; Republic of Iraq Ministry of Agriculture, 2021a, 2021b, 2021c)

Map 5 Agricultural and arable areas according to the districts (study area) for the year 2021



Source: - From the researcher's work, based on:

1. Table (4) data .

2- Arc Map Output 10.4.1.

2- Industrial activity :-

Industry represents the key of any social, economic and civilizational progress, as it is one of the most prominent economic activities in all societies, due to its great effect on the development of countries and the achievement of economic and social development. It contributes to the national income, providing job opportunities, and reducing unemployment rates, as is the industrial development. It is one of the important criteria for comparison between one country and another. The country has a developed industrial activity an ability to provide all the basic requirements for construction and progress to raise the standard of living of its population at the level of the governorates and regions of the country and its urban and rural parts("Spatial Development Report for the governorates of Iraq within the National Development Plan 2018-2022,Department of Regional and Local Development," 2019). Also, highway networks and their means are of great importance to industry, as they provide services, and are a link between production factors of different types and locations. The regions are uneven, so the role of transportation comes in re-providing and distributing the requirements of the industry, from the sites and regions in which its presence is not integrated. It provides raw materials, reduce production costs, and dispose of products(Al-Quraishi, 1992). The highway of the study area and the data of the table (5) show the numbers of large, medium, and small industries and the number of workers in the districts located along the highway to the study area. In addition, the medium industrial establishments, the number of employees in them reached (150) workers, while the number of small industrial establishments reached (374), and the number of employees in them were (830) workers. As for the districts of Amerli and Tuz Khurmatu, the number of industrial establishments in the district of Amerli amounted to (55) small industrial establishments only, while the number of workers in it was (175) workers. Yet, in the district of Tuz Khurmatu the number of industrial establishments was (70) establishments distributed by one large industrial establishment only, the number of workers in it reached (52) workers, while the number of medium industrial establishments reached (16) establishments. The number of workers was (176) workers, while there were only 53 small industrial establishments and (371) workers. Both Daquq and Kirkuk districts only have small industrial establishments in Daquq of (69) small industrial establishments only with reached (120) workers. Yet the number of industrial establishments was (539) distributed by (34) large industrial establishments and (4341) workers. Furthermore, the number of medium industrial establishments reached (24) with (429) workers. The small industries in the district reached (472) and (3808) workers. Hence, the extent of the daily transportation results from the

travelling of workers and the transfer of goods and products to the rest of the districts and sub-districts and to other governorates on the highway to the study area.

Table 5 Large, medium and small industries (government and private) and the number of employees according to the districts (study area) for the year 2021

Cases	Industries large.	Number Employees	Industries Middle	Number The workers	Industries Small	Number Employees
Al Zuhour	-	-	-	-	-	-
Al-Rashidiya	-	-	-	-	-	-
Al khalis	3	80	7	150	374	830
Amerli	-	-	-	-	55	175
Tuz Khurmatu	1	52	16	176	53	371
Daqoq	-	-	-	-	69	120
Kirkuk	34	4341	24	429	472	3808
Total	38	18111	53	866	1023	5304

(Republic of Iraq Ministry of Agriculture, 2021a, 2021c; Republic of Iraq Ministry of Planning, 2021; Republic of Iraq Ministry of Planning Department of Regional and Local Development, 2021)

Conclusions:

1- There is a close relationship between population distribution, density and transportation methods.

2- The study showed that the districts with large population densities were both Al-Zuhour and Al-Rashidiya, while the average population density was both Al-Khalis, Tuz Khurmatu and Kirkuk, while the low density included both Amerli and Daquq.

3- The large urban population density for each linear kilometer of the highway included the districts of Kirkuk, while the medium included all of the districts of Al-Zuhur, Al-Khalis and Tuz Khurmatu, while the few included each of the districts of Al-Rashidiya, Amerli and Daquq.

4- The large population density of the countryside per linear kilometer of the highway included both Al-Khalis district, while the medium included both Daquq and Kirkuk districts, while the few were Al-Zuhour and Amerli districts.

5- The importance of the highway and its great role on the economic activities of the districts and sub-districts located on both sides of the road.

Recommendations: -

This work recommends the following:

1- Developing and maintaining the (Baghdad-Kirkuk) highway due to its strategic location between the capital Baghdad and the northern governorates.

2- Attaching importance to strategic highway location stimulates the development of industrial activities on the highway sides.

3- Taking advantage of the importance of the highway develops agricultural development of the districts and sub-districts located on both sides of the highway and working to transport agricultural products at the lowest cost to the rest of the provinces.

4- Working on the development of human stabilizers on both sides of the road increase the daily transportation that results from the activities created by those stabilizers.

Bibliography

Abdul-Aziz, D. O. (2017). The Discovery of Oil and its Effect on Population Increase and Urban Development in Kirkuk(1934-1972) Historical Study. Kirkuk Journal of Human Studies, 12(7).

Ahmad, H. A.-D. J. A.-R. (2010). Geographical Statistics. Libya: Dar Al-Fadil for Publishing and Distribution.

Al-Bayati, I. F. K. M. (2014). The Role of Transportation Methods in the Growth and Distribution of Human Settlements in Tuz Khurmatu District. (master's Unpublished). University of Tikrit, College of Education for Humanities.

Al-Janabi, A. Z. A. (2017). Human Nature, University of Babylon, College of Education for Human Sciences (1 ed.). Amman: Dar Safaa for Publishing and Distribution.

Al-Jubouri, A. A. A. D. (2018). Spatial analysis of geographical components and their effect on achieving sustainable agricultural development in Kirkuk Governorate (PhD Unpublished)). University of Tikrit, College of Education for Human Sciences.

Al-Jumaili, S. M. H. (2020). The Role of Transportation in Transporting: Agricultural Products in Kirkuk Province. (PhD unpublished). University of Baghdad, College of Education - Ibn Rushd For humanities.

Al-Quraishi, M. S. T. (1992). Ahmed Hassan Al-Hiti, Introduction to Transport Economics: University of Mosul.

Al-Sarhan, Z. A. M. (2009). Transport Network and its Effect on Agricultural Development in Babylon Governorate. (Master unpublished). University of Babylon, Faculty of Education.

Al-Zubaidi, R. A. A.-R. H. (2021). Evaluation of the Qualitative Characteristics of Surface and Groundwater Resources in Al-Khalis District. (PhD

unpublished). University of Baghdad, College of Education - Ibn Rushd for Humanities.

Allam, A. A. S. (2009). Transport Economics (1 Ed.). Alexandria: Al Wafa Legal Library.

Aziz, M. K. H. (2022). Evaluation of the Efficiency of Automobile Transportation Roads in Al-Rashidiya District. (Master unpublished). University of Baghdad, College of Education for Girls.

Cooperation, R. o. I. M. o. P. a. D. (2020). Department of Regional and Local Development, Division of GIS.

Fayyad, H. N. (2022). The Growth of the Urban Population in Iraq and Its Social and Economic Effect. Omran Journal, 11.

Ministry of Planning, R. a. L. D. D. (2021). Republic of Iraq, , Diyala Governorate Planning Directorate, Kirkuk and Salah al-Din, (unpublished data).

Ministry of Water Resources. (2020). General Commission for Survey , Map Production Unit, Digital Unit, Drawing Scale (1,000,000:1).

Muhammad, H. Q. (2017). Population Growth of Basra Governorate According to Censuses and Projections of 2012, University of Basra, Center for Basra and Arabian Gulf Studies. Basra Research Journal for Humanities, 42(6).

Rasul, A. A.-H. (1986). Studies in the Geography of Transport. Beirut: Dar Al-Nahda Al-Arabiya for Printing and Publishing.

Republic of Iraq Ministry of Agriculture. (2021a). Directorate of Agriculture of Diyala Governorate, Planning and Follow-up Department, (unpublished data).

Republic of Iraq Ministry of Agriculture. (2021b). Directorate of Agriculture of Kirkuk Governorate, Statistics,(unpublished data).

Republic of Iraq Ministry of Agriculture. (2021c). Directorate of Agriculture of Salahuddin Governorate, Statistics,(unpublished data).

Republic of Iraq Ministry of Planning. (2021). Department of Regional and Local Development, Department of Local Planning,(unpublished data).

Republic of Iraq Ministry of Planning and Development Cooperation. (1997). Central Statistical Organization, Population Census Results for 1987, 1997, (unpublished data).

Republic of Iraq Ministry of Planning and Development Cooperation. (2020a). Central Agency for Statistics and Information Technology, Iraq Population Estimates for, unpublished data.

Republic of Iraq Ministry of Planning and Development Cooperation. (2020b). central Bureau of Statistics, Miria Population and Labor Force Statistics, Iraq's population estimates for the year 2008,2020,(unpublished data),.

Republic of Iraq Ministry of Planning Department of Regional and Local Development. (2021). Kirkuk Governorate Planning Directorate, Planning and Studies Division,(unpublished data), scattered pages.

Spatial Development Report for the governorates of Iraq within the National Development Plan 2018-2022,Department of Regional and Local Development. (2019).