The Impact of Population Changes on the Functional Composition of the City of Samarra and Its Prospects

Ahmed, R. A.[1*] and Sebahi, R. K.[2]
Department of Geography, College of Education for Humanities Ministry of Education, Tikrit University, Iraq
E-mail: readabdalaa@tu.edu.iq,[1] rawaareem1979@gmail.com [2]
**Corresponding Author*

DOI: https://doi.org/10.52939/ijg.v20i5.3237

Abstract
The building of a city is made up of a complex system of activities that vary in the importance of distribution on a geographical area within the city depending on the city's size and importance to its surrounding region. Due to its ability to examine spatial correlations and variations, the geographer plays an important role in studying and evaluating the various land uses in the city by disclosing the disadvantages and positives associated with their distribution. As a result, the study of the city's functional uses (composition) illustrates the diversity of the city's activities and the activities that exist on its territory. This research is concerned with the study (the impact of population changes on the functional composition of the city of Samarra and future horizons) by clarifying the population changes of the city and its reflection on how the land of the city and the activities that were built on it now and questioned in the future. These functions and analysis of their geographical distribution and the use of planning standards to identify the functional and spatial efficiency of the various jobs, and the extent of these functions to serve the city's population and region. The research showed that the city suffers from an imbalance in the relationship between the population and jobs, such as the commercial function, which contributed to the security conditions in the transfer of this function from the old city to the new quarters without reference to planning standards, as well as the phenomenon of confusion in some residential quarters through which Randomization in the distribution as well as for the educational function, which can be addressed part of its problems through the optimal use of the space available to them .. etc. of other functions. As a result, the research will attempt to assess the problems and provide answers, as well as sketch a future image of these functions by examining future population growth and planning standards to improve the structure of Samarra city's urban environment.

Keywords: Urban Planning, Land Use Change, Geographical Modeling

1. Introduction

Many researchers have been interested in studying the relationship between demographic, economic, and social variables and population growth. We also find many international and local reports that indicate interest in such studies, such as the World Population Conference held in 1974 in Bucharest and the International Conference held in 1984 in Mexico City [https://www.un.org/en/conferences/population/mexico1984]. We currently find an increase in studies interested in the population aspect and studying the most important variables that affect it and the problems that may arise. This is because the population is the main and important axis that plays an effective role in growth, development, and prosperity [1]. Our research focuses on Samarra, one of Iraq's most densely populated cities. Samarra is considered one of the most beautiful historical and urban cities and is a center of culture and civilization. It is characterized by the elements of society that make it a reason for development, growth, and population crowding [2].

Population changes profoundly impact societies' functional composition, affecting economic, social, and political dynamics. Understanding the complex relationship between population change and spatial dysfunction is critical for urban planners, policymakers, and researchers [3]. By land use, we mean here the economic and cultural activities practiced in a particular place or region, including agricultural, residential, industrial, mining, and recreational uses. LULC (Land Use and Land Cover) helps understand long-term trends and changes in land use patterns.

These maps provide essential information for various levels of planning, management, and policymaking. They help evaluate the impact of human activities on ecosystems and are vital for sustainable development [4].

One of the most important aspects of city studies is the process of identifying past and present demographic characteristics and their future projections. Predicting population size helps determine the areas of land required for various uses, whether residential, educational, or other recreational, as well as the necessary future infrastructure and public social services [5]. The focus on cities, changes in economic factors, and the opening of some projects in the town led to the creation of more job opportunities. Social and demographic factors are also considered factors that help in residential development and growth [6]. All of this impacted the migration of citizens from rural areas to urban areas in search of a better life. This study aims to evaluate the impact of population change and its impact on the city of Samarra and its revival, as the most important challenges and problems that the city faced due to this population encroachment.

1.1 Research problem

The city's population change has affected the functional structure of its urban space, leading to functional confusion. This confusion has arisen from planning decisions that changed the use of certain areas from residential to commercial. As well as functional overlap in most of the city's quarters, which had a negative effect on other urban land uses.

1.2 Research hypothesis

The research hypothesis is based on:

Despite municipal approvals that are not commensurate with the planning skills of the new invasive job, the city's demographic change may impact the unstudied employment overlap and uncertainty inside the city, disrupting existing job relations.

1.3 Research objective:

The study aims to offer a comprehensive understanding of how population change contributes to different types of job displacement within the city. It also seeks to identify the key challenges arising from this change, specifically the issue of job confusion in the city, which is considered a significant aspect of Iraq's commercial landscape.

2. Research Methodology

This study used inductive analysis and statistical data to support its findings. Aerial images and satellite views were also used to provide a picture of changes in the functional organization of the urban space.

2.1 Time and Place Limits

Time limit: The research spans the years 1947 to 2020, the date of the study, which is the period that saw a significant change in the city's population as well as functional changes. Spatial limit: The municipal limits of the city, which run from the Tigris River in the west to the Muthanna quarter in the east and from the drug factory in the north to the industrial district in the south, are represented by the spatial boundaries, which are astronomically located at 34°11′54″N 43°52′27″E. Figure 1.

2.2 Population changes in the Study Area

The city's population has changed over the years, as shown in Table 1. The population of Samarra reached (7,490) people in (1947) and then rose rapidly to (16,524) people in (1957), with an increment rate of 120.61%. This significant increase is due to natural growth and migration factors from the city's countryside to its center. This is a result of the development projects being constructed in the city, such as the construction of the Samarra Dam, which was built in 1953 by the German Zeppelin company.

In 1965, we find that the population increment rate increased to 51.65% due to the increase in job opportunities resulting from the construction of the Samarra Dam and the city's economic development. The increment rate also increased in 1977, bringing the city's population to 37,234 people. This increase can be attributed to the establishment of a pharmaceutical factory within the city (Samarra), which helped attract many residents looking for work. Thus, the population increment rate continued to rise year after year. In addition to the urban and economic expansion, which impacted the continued population growth within the city, Table 1 shows the rates of increase in the population from 1947 to 2020, and Figure 2 shows the population increment rate for the same period.

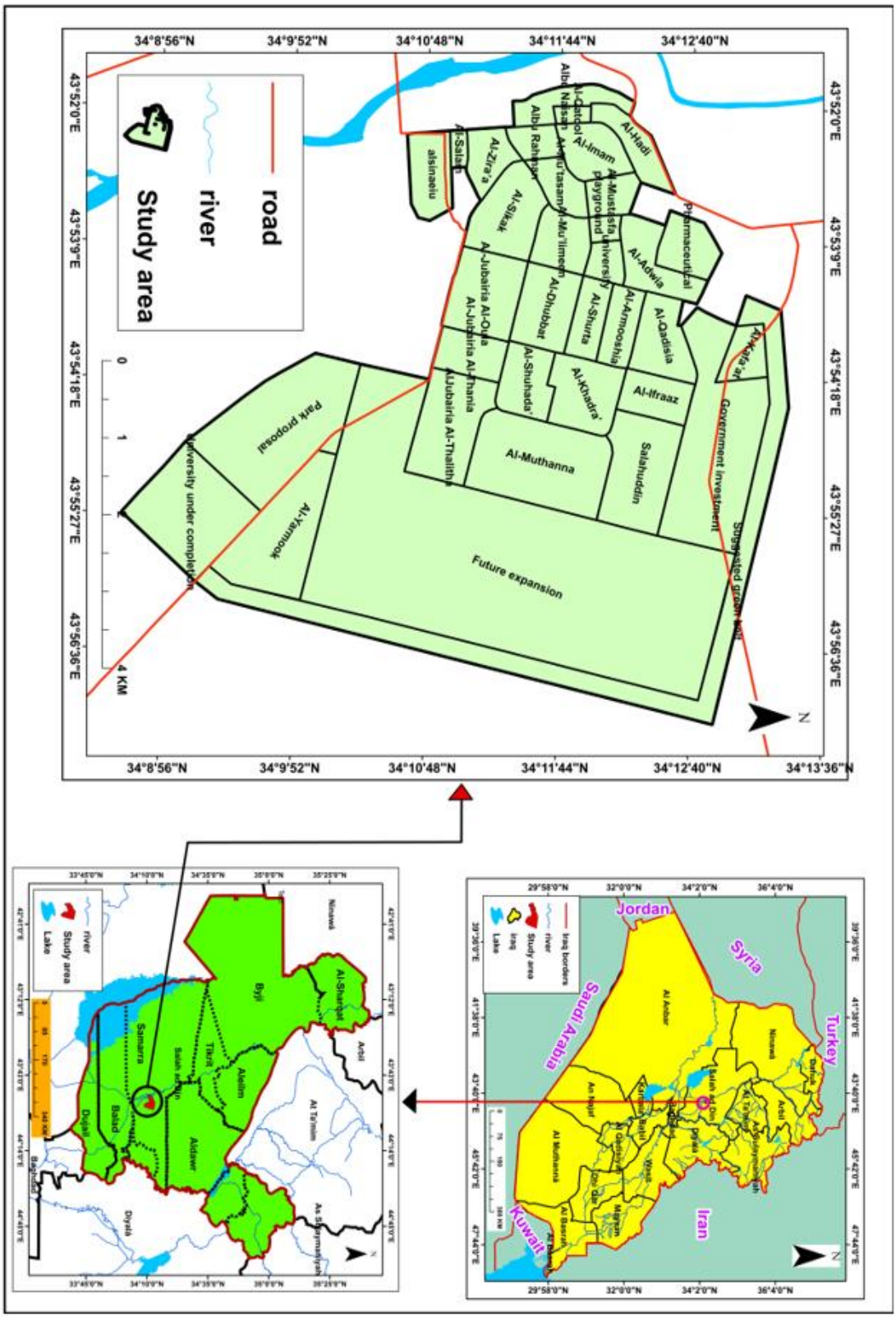

Figure 1: Location of the study area for Iraq and Salahuddin Governorate in 2020

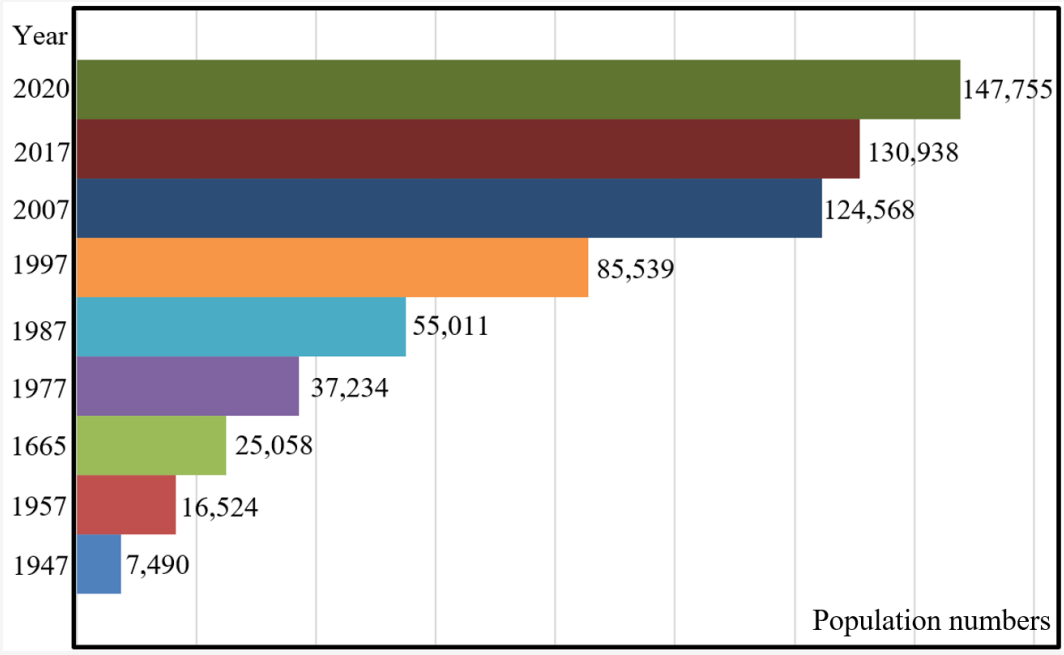

Figure 2: Population numbers from 1947 to 2020

Table 1: Population statistics from 1947 to 2020 [7][8] and [9]

Census year	Total population of Samarra	Population increment	Exponential increment rate [%]	increment rate [%]
1947	7,490	-	-	-
1957	16,524	9,043	8.2	120.61
1965	25,058	8,534	5.3	51.65
1977	37,234	12,176	3.4	48.59
1987	55,011	17,777	4	47.74
1997	85,539	30,528	4.5	55.49
2007	124,568	39,022	3.8	45.63
2017	130,938	6,370	0.5	5.11
2020	147,755	16,817	4	12.84

To predict the exponential growth of the population, Equation 1 was used [7]:

$$P_1 = P_0(1+r)^n$$

Equation 1

Where:

P_1 = Population for the target year,
P_0 = current population,
r = population increment rate
n = number of expected years.

To calculate the increment rate of population in the period from 1947 to 2020, Equation 2 was used.

$$Increment\ rate\,[\%] = \left[\frac{P_1 - P_0}{P_0}\right] \times 100$$

Equation 2

Where:
P_1 and P_0 are populations for the target year and current population, respectively.

The rapid population growth witnessed by the city, which exceeds the number of existing residential units, has contributed to the high occupancy density of residential units, which has led to accelerating the urban deterioration of existing buildings, especially when not accompanied by continuous maintenance of the buildings [10].

2.3 Distribution of the General Density of the Population in the Quarters of Samarra

Due to the urban design pattern and its separation into quarters based on the functions it performs, the population is dispersed unevenly throughout the urban space. As a result, depending on its functional qualities and the land it occupies, each type of land use draws a different number of residents, and as a result, the densities vary amongst the city's quarters [11]. The obvious disparity in population densities throughout the city is a major contributor to the creation of the phenomena of deteriorated areas inside Samarra. The number of quarters in Samarra for the year 2015 reached 26 quarters. Table 2 displays the population number [ppl], area, and general density [ppl/ha] per quarter in Samarra for the year 2020. Figure 3 shows the distribution of population in the quarters of Samarra.

Figure 4 displays the various regions with different population densities which can be divided into four regions. The following are the general population densities at the quarter level:

First Region: It is the quarters with very high densities that are confined between the category 425.7 ppl/ha- and 567.5 ppl/ha. It is indicated in Figure 4 by the maroon color. These regions include Al-Bu Naisan 567.5 ppl/ ha.

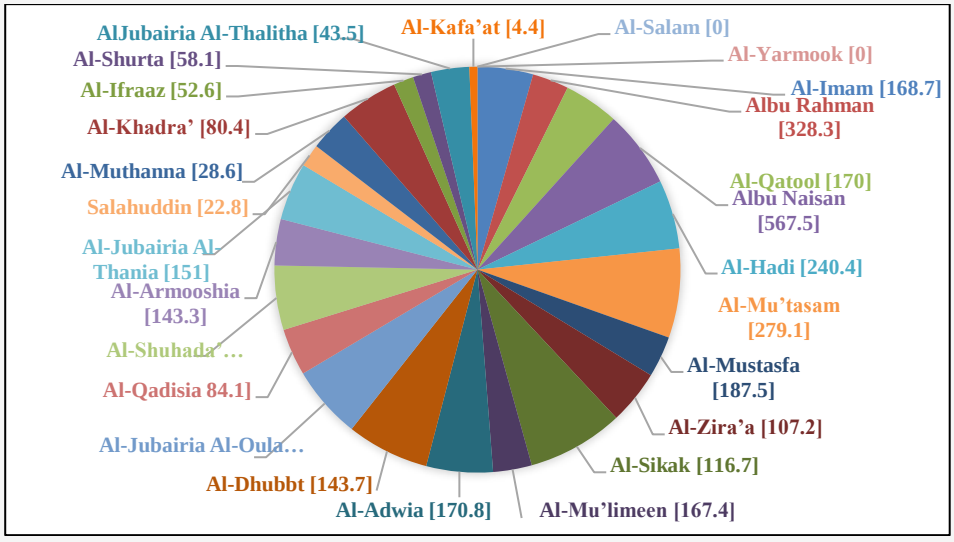

Figure 3: Distribution of population density in the quarters of Samarra [ppl/ha]

Table 2: Population statistics per quarter in Samarra for the year 2020

No.	Quarter name	Population numbers [ppl]	Area [ha]	General density [ppl/ha]	No.	Quarter name	Population number [ppl]	Area [ha]	General density [ppl/ha]
1	Al-Imam	6,537	35	186.7	15	Al-Shuhada'	7,576	55.2	132.2
2	Albu Rahman	4,283	10	328.3	16	Al-Armooshia	5,447	38	143.3
3	Al-Qatool	6,460	38	170	17	Al-Jubairia Al-Thania	6,781	44.9	151
4	Albu Naisan	9,081	16	567.5	18	Salahuddin	2,667	116.8	22.8
5	Al-Hadi	8,104	33.7	240.4	19	Al-Muthanna	4,696	164	28.6
6	Al-Mu'tasam	10,495	37.6	279.1	20	Al-Khadra'	6,914	85.9	80.4
7	Al-Mustasfa	4,840	25.8	187.5	21	Al-Ifraaz	2,352	44.7	52.6
8	Al-Zira'a	6,379	59.5	107.2	22	Al-Shurta	2,153	37	58.1
9	Al-Sikak	11,329	97	116.7	23	AlJubairia Al-Thalitha	4,497	103.3	43.5
10	Al-Mu'limeen	4,554	27.2	167.4	24	Al-Kafa'at	943	210	4.4
11	Al-Adwia	7,825	45.8	170.8	25	Al-Salam	0	6.2	0
12	Al-Dhubbt	9,704	67.5	143.7	26	Al-Yarmook	0	24	0
13	Al-Jubairia Al-Oula	8,600	65.5	131.2		Total	147,755	1586.4	-

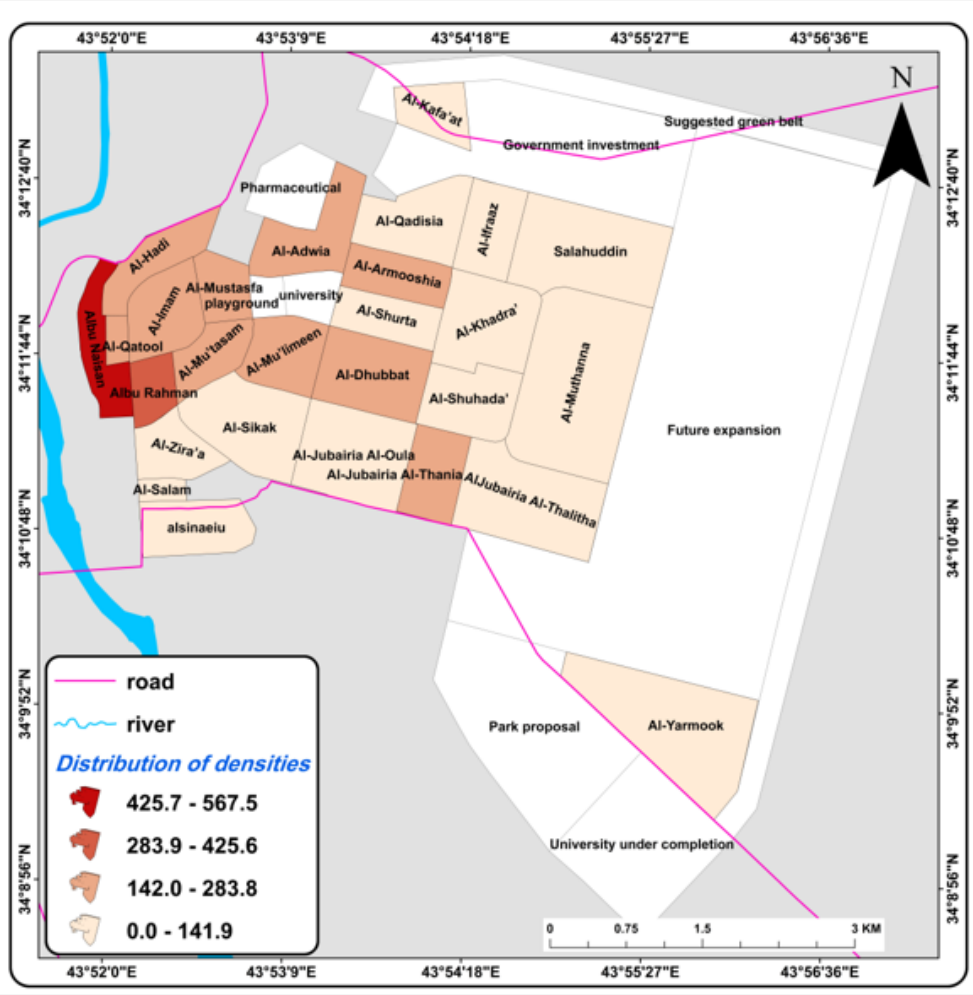

Figure 4: Distribution of population densities in the quarters of Samarra in 2020

Second Region: It is the quarters with high densities that are confined to the category 283.9-425.6 ppl/ ha. It is indicated in Figure 4 by dark brown color. These regions include Al-Bu Rahman 328.3 ppl/ ha.

Third Region: It has an average density between 142.0-283.8 ppl/ ha and it appears in Figure 4 in light orange color. These regions included Al-Mu'tasam 279.1 ppl/ ha, Al Hadi 240.4 ppl/ ha, Al-Mustashfa 187.5 ppl/ ha, Imam 186.7 ppl/ ha, Al-Adwia 170.8 ppl/ ha, Al-Qatool 170 ppl/ ha, Al-Mu'alimeen 167.4 ppl/ ha, Al-Jubairia Al-Thania, 151 ppl/ ha, Al-Dhubbt 143.7 ppl/ ha, and Al-Armooshia is 143.3 ppl/ ha,

Fourth Region: which includes low densities that are confined to the category between 0-141.9 ppl/ ha and it is shown in Figure 4 in pale yellow. These regions are Al-Shuhada' 132.2 ppl/ ha, Al-Jubairia Al-Oula 131.2 ppl/ ha, Al-Sikak 116.7 ppl/ ha, Al-Zira'a 107.2 ppl/ ha, Al-Khadra'quarter is 80.4 ppl/ ha, and Al-Qadisia 84. ppl/ ha, Al-Shurta 58.1 ppl/ ha, Al-Ifraz 52.6 ppl/ ha, AlJubairia Al-Thalitha 43.5 ppl/ ha, Al-Muthanna 28.6 ppl/ ha, Salahuddin 22.8 ppl/ ha, and Al-Kafa'at 4.4 ppl/ ha. Al-Salam and Al-Yarmouk have 0 ppl/ ha since these quarters were distributed in 2013 and are uninhabitable at present,

This distribution tries to give a rough idea of the distribution of densities within the city's quarters while keeping in mind that there are spatial factors that play a role in varying densities, such as the social and economic factor, the quarter's area, the area of residential units, the availability of open areas, proximity and distance from the commercial center, the availability of services, and the security factor. There is a noticeable differential in densities at the quarter level within the city, and there is a strong association between density and the degree of erosion within the city since high population densities within quarters are one of the reasons for the formation and increase of urban erosion.

Table 3: Population per quarter and net population densities in the city of Samarra in 2020

No.	Quarter name	Population number [ppl]	Residential area [ha]	Net density [ppl/ha]	No.	Quarter name	Population number [ppl]	Residential area [ha]	Net density [ppl/ha]
1	Al-Imam	6,537	30.2	216.4	15	Al-Shuhada’	7,576	51	143.1
2	Albu Rahman	4,283	8.9	481.2	16	Al-Armooshia	5,447	33.3	163.5
3	Al-Qatool	6,460	18.6	347.3	17	Al-Jubairia Al-Thania	6,781	38.7	175.2t
4	Albu Naisan	9,081	13.4	677.6	18	Salahuddin	2,667	101	26.4
5	Al-Hadi	8,104	21.7	373.4	19	Al-Muthanna	4,696	87.7	53.5
6	Al-Mu’tasam	10,495	30.5	344	20	Al-Khadra’	6,914	45.7	151.2
7	Al-Mustasfa	4,840	21.3	227.2	21	Al-Ifraaz	2,352	21	112
8	Al-Zira’a	6,379	37.9	168.3	22	Al-Shurta	2,153	29.9	72
9	Al-Sikak	11,329	68.5	165.3	23	AlJubairia Al-Thalitha	4,497	92,3	48.7
10	Al-Mu’limeen	4,554	21.4	212.3	24	Al-Kafa’at	943	145	6.5
11	Al-Adwia	7,825	40	195.6	25	Al-Salam	0	0	0
12	Al-Dhubbat	9,704	62.7	154.7	26	Al-Yarmook	0	0	0
13	Al-Jubairia Al-Oula	8,600	49.8	172.6		Total	147,755	1121.8	131.7
14	Al-Qadisia	5,539	51.3	107.9					

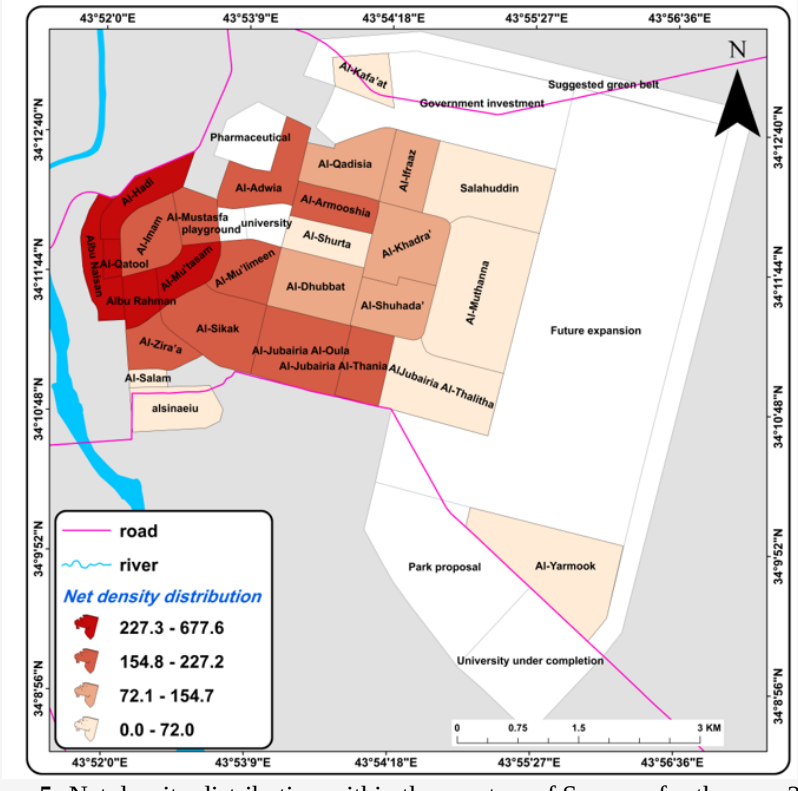

Figure 5: Net density distribution within the quarters of Samarra for the year 2020

2.5 Distribution of the Net Population Density Over the Quarters of Samarra

It is a representation of the relationship between the population number and the built-in spatial spaces in the region, eliminating all uninhabited spaces, that is, all areas where the people do not normally dwell, such as parks, streets, playgrounds, and public buildings [12]. Because one of the most important factors contributing to the increase in the erosion of the housing unit is the increase in the size of the population presence within the housing unit, the use of net density is important in the variation in the size of the population presence within the housing unit. Table 3 reveals the nature of the net density distribution inside the city of Samarra. Figure 5 displays the net density distribution inside the city of Samarra which can be divided into four regions:

First Region: It represents a very high net density and includes the category of 227.3 ppl/ha and 677.6 ppl/ha (maroon color). These include the quarters (Albu Naisan, Albu Rahman, Al-Qatul, Al-Baladiyat, and Al-Hadi). The reason for the high net density in these quarters is due to two aspects: First: Most of these quarters have been built randomly, so the process of its spatial organization is complex, and the second factor is the social factor, where the phenomenon of clan concentration is concentrated, which led to a high population density within those areas.

Second Region: It represents a high net density and includes the group confined between 154.8-227.2 ppl/ha (dark brown color). It is distributed over several quarters (Al-Imam, Al-Mustasfa, Al-Mustasfa, Al-Zira'a, Al-Sikak, Al-Mu'limeen, Al-Adwia, Al-Jubairia Al-Oula, Al-Armooshia, Al-Armooshia, Al-Jubairia Al-Thania). The high population density is due to the population increment in addition to another factor which is the increase in the number of housing units due to the division of the original housing units with large areas (600 m) into more than one housing unit, which increased the net population density.

Third Region: It represents the average net density and includes the category that is limited to 72.1-154.7 ppl/ha (light orange color). It is distributed over different quarters (Al-Dhubbat, Al-Qadisia, Al-Shuhada', Al-Khadra', and Al-Ifraaz).

Fourth Region: It represents the low net population density and includes the group confined between 0-72.0 ppl/ha (pale yellow). These include the quarters (Salahuddin, Al-Muthanna, Al-Shurta, AlJubairia Al-Thalitha, and Al-Kafa'at). The reason for the decrease in net population density is due to the incompleteness of Quarters as a result of poor distribution of services or that quarters such as Yarmouk and Al Salam are newly distributed.

3. Results and Discussion

3.1 Urban Land Use Change

Land use reflects the population's activities and their activities inside the city. These activities are framed by insecure economic and social relations. So, any change in the pattern of relationships is inevitably accompanied by a change in activities and events, any change in land uses, and this random change robs the urban individual of his comfort and confounds the city's functions [13]. Career change in Samarra has been influenced by two reasons, the first of which is government activities. For the year 2002 AD, it issued Resolution 117 [14]. As a result, many green and service spaces have been converted into residential areas, as seen in the Al-Sikak Quarter, Al-Ma'mal Quarter, and Al-Qadisiyah District. The second driver in the professional shift is the people within the city, particularly following the events of 2006 AD, which saw the bombing of the Imami shrine (peace be upon them) and the closing of the old city, causing commercial jobs to migrate into residential neighbourhoods. It depicts the geographical distribution of job transition areas, focusing on commercial jobs.

3.2 The Disregard for the Law and Slum Expansions

Previous modifications and weaknesses in the country's planning laws have contributed to a functional change in Samarra's green areas. Table 4 and Figure 6 summarize the type and direction of change. They are divided into two sections.

A. Government abuses: Government agencies are trying to accommodate population growth through functional changes in green spaces within city neighborhoods. Especially for the benefit of those with strong influence within the city, which helped change these areas, including neighborhoods such as (Al-Zira'a, Al-Sikak, and Al-Adwia). As a result of these exceptional allocations, the number of functional change areas reached 11 areas, and the area of the change areas reached 4.2 hectares.

B. Encroachments and transgressions by some citizens: This results from the poor performance of the municipality within the region, if not its complete inability. Some citizens are converting some unused green spaces into residential areas, especially in neighborhoods such as (Al-Jubairiya Al-Oula, Al-Qadisiyah, Al-Armooshiya, Al-Jubairiya Al-Thania, Salahuddin, Muthanna, Khadra, Al-Ifaraz) where the area changed by citizens reached 8.36 hectares.

3.3 A Lack of Regard for the Law and the Growth of Slums in Urban Areas

Due to a lack of public services such as electricity, potable water, sewage, and waste collection. As well as the deterioration of housing conditions and status (morphology and internal composition), urbanisation has increased in poor, marginal slum areas within and on cities' outskirts [15]. One of the most important factors contributing to the emergence of slums in Samarra is the transgressor's income level, which does not allow him to provide legal housing, so they illegally resort to random housing.

Table 4: Geographical distribution of trespassing on green areas in Samarra in 2020

No.	Quarters	Number of green areas	Career change mechanism		No.	Quarters	Number of green areas	Career change mechanism	
			number of exceptional allocations areas by government	number of transgressions by citizens				number of exceptional allocations areas by government	number of transgressions by citizens
1	Al-Imam	-	-	-	14	Al-Qadisiya	2	-	1
2	Albu Rahman	-	-	-	15	Al-Shuhada'	2	-	-
3	Al-Qatool	-	-	-	16	Al-Armooshiya	4	-	1
4	Albu Naisan	-	-	-	17	Al-Jubairiya Al-Thania	1	-	1
5	Al-Hadi	-	-	-	18	Salahuddin	3	-	3
6	Al-Mu'tasam	-	-	-	19	Al-Muthanna	3	-	3
7	Al-Mustasfa	-	-	-	20	Al-Khadhraa	3	-	1
8	Al-Zira'a	3	3	-	21	Al-Ifraaz	2	-	1
9	Al-Sikak	5	5	-	22	Al-Shurta	4	-	4
10	Al-Mu'limeen	2	-	-	23	Al-Jubairiya Al-Thaltha	3	-	2
11	Al-Adwia	3	3	-	24	Al-Kafa'at	2	-	-
12	Al-Dhubbat	8	-	-					
13	Al-Jubairia Al-Oula	3	-	2		Total	53	8	19

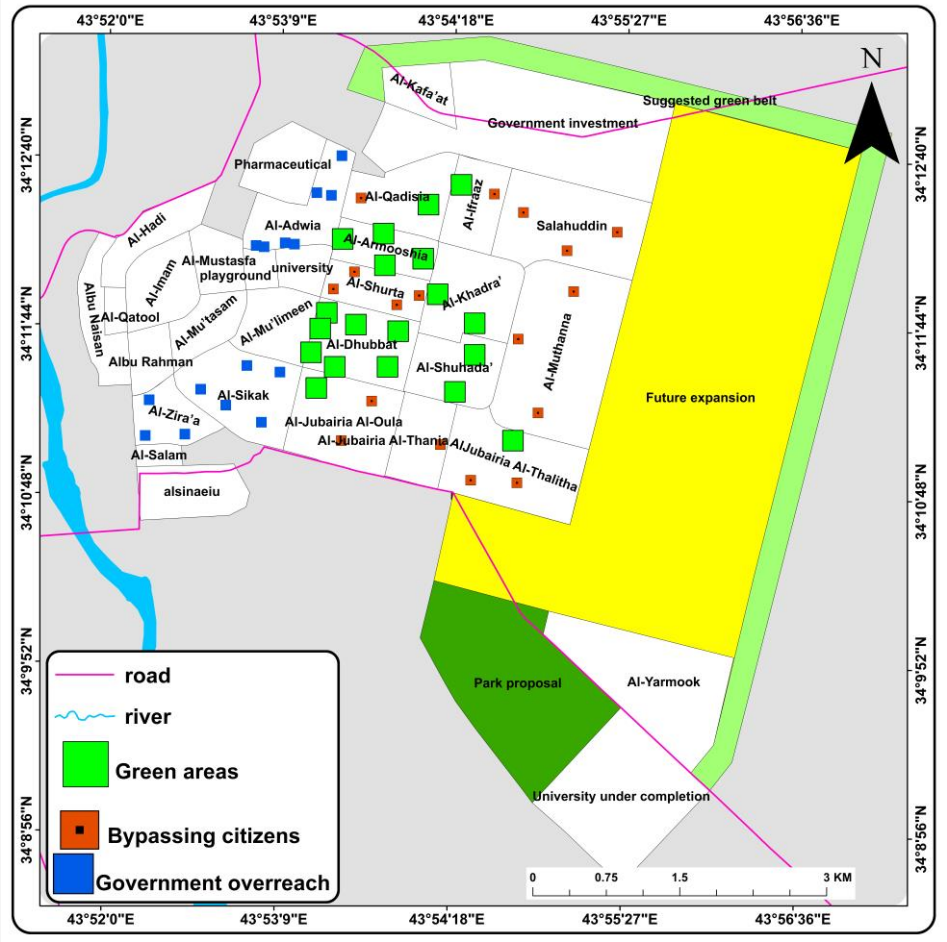

Figure 6: Geographical distribution of green and trespassed areas in 2020

In addition to the immigration factor, due to the deteriorating economic conditions in the places he immigrated from. Especially in rural areas, agriculture no longer provides economic returns,

especially for those who do not work in agriculture, as well as the forced migration that occurred after the year 2014 AD. Also, the city of Samarra was formed as a haven by military operations. The state of transgression and lack of respect for the law took two forms inside the city of Samarra:

First: Individuals and immigrants trespassing on areas designated for incomplete public services, especially in quarters (Al-Khadra', Al-Muthanna, Salahuddin, Al-Jubairiya Al-Thaltha, and Al-Jubairiya Al-Oula). (Al-Khadra' - Al-Muthanna - Salah Al-Din Al-Jubairiya Al-Thaltha - Al-Jubairiya Al-Oula). Mud, wood, and concrete blocks are the construction materials in these quarters, which are marked by overpopulation and a distinct lack of services.

Second: expansion and construction in the agricultural lands surrounding the city, where large areas of agricultural lands surrounding the town have been sorted out randomly and distributed in different places, especially in the north of the city as a medicine factory, Al-Kafa'at quarter, and Al-Qadisiyah. In addition to not taking into account the allocation of land areas for public services or infrastructure, the number of existing housing units is estimated at more than 600. The real problem in these areas lies when the city's urban expansion takes place. As the city of Samarra lacks a specialised dimension in its birth process, this generates an imbalance between its structure and these captive spaces, which will develop degraded areas added to the city of Samarra.

3.4 High Indicators of Service Problems

City dwellers place a high value on services, and this is due to the growing human demand for them, particularly as the level of urbanisation experienced by human groups has increased, as has the development of techniques and methods used in providing and providing the service, as well as the various and varying levels of its types in the place [16]. Samarra suffers from a clear lack of public services in quantity and quality. The size of the deficit is evident as follows:

A. Educational services, as the general percentage of the lack of service within quarters is (22.1%) as the city suffers from a clear lack of this service, in addition to taking some of these schools as military headquarters. Also, the building is old or works in the double-shift system, and the highest dissatisfaction rate is in the quarters in Al-Mustashfa and Salahuddin. Also, the Al-Mustashfa quarter, one of the slums lacking service spaces, depends on the Al-Mu'tasim and Al-Ma'mal quarters, which are far away. Salahuddin quarter suffers from a glaring absence of all amenities, and schools are unavailable. While there are places allocated for educational land uses, they are taken by random housing, forcing inhabitants to rely on schools in the Al-Muthanna and Al-Ifraz quarters.

B. As for health services, the size of the shortage in the study sample population amounted to 15.8%. The city has a clear deficiency in the volume of health services, as it relies on one hospital that was built in the 1970s to accommodate only 50 beds, putting it under a lot of strain. In addition, the city has only three (3) health centers, which is insufficient when compared to the number of residents, resulting in a clear shortage. Al-Burrahman, Al-Qatul, Al-Bonaisan, and Al-Hadi are the most famous quarters that suffer from cutting distances to reach a medical center because the health center in the Al-Qatul quarter was relocated to a military barracks. Because of the quarter's modernism, the nearest health clinic is the teachers' quarter. According to the survey, the Al-Shurta quarter suffers from the absence of a health center nearby.

Third: Recreational services are just as vital as health and educational services in terms of their existence, as they are a green lung in a densely crowded metropolitan region that plays a major part in the city's citizens' recreation. The total deficit of the study sample reached 24%. As the lack of public parks, children's playgrounds, and gardens is absent in the urban space, the most prominent quarters in which the shortage rate is high are Al-Imam, Al-Hadi, Al-Mu’tasim, Al-Sikak, Al-Mu’alimeen, Al-Adwia, Al-Dhubbat, Al-Aramooshiya, Al-IFraz, and Al-Kafa’at. The old neighbourhoods have grown randomly, as no places are designated for services or entertainment. Instead, the majority is for residential purposes, as it occupies the first place. As for the other neighborhoods’, there are areas designated for entertainment, but they are either not exploited by the municipality, that is, they have abandoned lands, or due to municipal procedures, they have been converted from service areas to residential areas. The most prominent general problems that the city suffers from as a whole, are the following:

1. 1. Sewage services that the city as a whole suffers from without exception. The percentage of the deficit, according to the study sample, reached 23.9% [16] of the total other services

with their variation in the quarters. We find that the percentage of shortages varies between the first and second sectors, which represent the old quarters. This is because these quarters have sewers of both types. However, the introduction of these pipes, as well as frequent blockage problems and poor municipal performance, are the ones that cause many problems from the constant flooding of these quarters, especially during the winter. Except for the Al-Mu'alimeen and Al-Armooshiya quarters, which connect the housing units located on the main street to the strategic conveyor line, which is currently closed due to its incompleteness in the first place. Since 1990, these quarters have lacked a sewage network, which is also absent in the other quarters. This causes more suffering in the winter, especially. The new quarters also suffer from paving the streets, which are limited only to the main roads. The loss of sewage and street paving made the person in those quarters feel that he lived in the early twentieth century. This was also reflected in the groundwater problem due to sewage loss. Residents resort to digging drains, which constitute a future demolition tool for the housing unit.

2. Narrow streets accounted for 11.6% [17] of the overall difficulties and were dispersed in the old quarters in the first and second rings due to the random quarters' growth. As a result, tiny streets exist in places such as Al-Imam, Al-Burrahman, Al-Qatul, Al-Bunaishan, and Al-Mu'tasim. Poor planning is one of the main causes of small streets, which are often 4 meters wide, in new or planned quarters. The most prominent quarters that suffer from it are Al-Jubairiya Al-Oula, Al-Dhubbat, and Al-Armooshiya.
3. Because some quarters suffer from job mixing, we find that the old area has an old industrial quarter, which is one of the most significant challenges it faces owing to pollution, noise, and job dissonance in those regions. The other quarters that witness functional overlap are Al-Jubairiya Al-Oula, Albunaisan, and Al-Zira'a, and these industries are concentrated on the main streets. The phenomenon of functional mixing is another issue that the city faces, as this heterogeneous mixing presents a negative image of this interference, as visual pollution, in addition to noise pollution, and heterogeneity in the form of industrial stores and the exploitation of sidewalks and streets is another type of service degradation, as well as a defect in the city's functional structure.
4. Water and electricity services are also in limited supply, with 19 percent [17] of the sample population experiencing an evident shortage of potable water and 50 percent experiencing a lack of electricity due to faulty equipment, indicating the deteriorating condition of the city's services.

4. Conclusion

In the end, we find that the acceleration of population growth within the city has contributed to creating a state of irregularity in urban land use, as it is constantly changing to accommodate this population increase. Not to mention that the movement of commercial jobs to the new streets as a result of the security conditions witnessed by the city played a role in the emergence of job confusion, which helped create many problems, especially job irregularity and traffic congestion. We also find that the population growth movement and the inability to implement planning laws contributed to creating chaos within the city's urban environment, represented by encroachments on green spaces and the emergence of randomness within the urban space.

Finally, we find that the municipality's work has an important supervisory role in regulating land uses within the city. However, the municipality did not have that role in regulating land uses within the urban space, contributing to the urban environment's deterioration.

5. Recommendations

1. Improve job performance within the city by balancing the population and regulating land uses according to planning standards. This will reduce the momentum of the city's job structure, which is reflected in job and service performance.
2. Working on organizing the new commercial streets by modifying and maintaining street furniture in proportion to the commercial use on all the previous streets.
3. Tightening the municipality's oversight role, especially in changing the purpose of use and imposing procedural restrictions on construction work, to ensure the application of basic design vocabulary, which achieves a high level of well-being for the urban environment within the city.

References

[1] Hefny, R. M. and Elnasser, R. A., (2022). Impact of Population Growth on the Most Important Economic Variables in Egypt. *Sinai Journal of Applied Sciences*, Vol 11, 765-778. https://doi.org/10.21608/sinjas.2022.148649.1128.

[2] Hilal, M. M. and Al-Badri, M. S. M., (2021). Proposed Urban Design of the Area Surrounding the Great Samarra Mosque. *IOP Conference Series: Earth and Environmental Science*, Vol. 779. http://dx.doi.org/10.1088/1755-1315/1259/1/012014.

[3] O'Sullivan, J. N., (2020). The Social and Environmental Influences of Population Growth Rate and Demographic Pressure Deserve Greater Attention in Ecological Economics. *Ecological Economics*, Vol 172. https://doi.org/10.1016/j.ecolecon.2020.106648.

[4] Viana, J. F. D. S., Montenegro, S. M. G. L., Srinivasan, R., Santos, C. A. G., Mishra, M., Kalumba, A. M., and da Silva, R. M., (2023). Land Use and Land Cover Trends and their Impact on Streamflow and Sediment Yield in a Humid Basin of Brazil's Atlantic Forest Biome. *Diversity*, Vol 15(12). https://doi.org/10.3390/d15121220.

[5] Othman M. G., (2002). *Planning Rural and Urban Land Uses*, 1st edition, Dar Al-Safa', Amman, Jordan, 1-99.

[6] Debele, E. T. and Negussie, T., (2022). Socio-demographic and Socio-Economic Dynamics Underlying Housing Development of Urban Residents in Sebeta Town, Ethiopia. *Cogent Social Sciences*, Vol. 8. https://doi.org/10.1080/23311886.2022.2130210.

[7] Najm A. A., (1989), *Changing the Population of Samarra District 1947-1987*, Master's Thesis Submitted to the College of Education, University of Baghdad.

[8] Central Statistical Organization, (1997). Planning Commission the results of the Population Census of Iraq, the Section on Salah al-Din Governorate, Samarra, 5.

[9] Ministry of Planning and Development Cooperation, (2011). Central Statistical Organization, Salah al-Din Governorate Statistics Department, Inventory and Numbering Data for the city of Samarra.

[10] Samarra Statistics Director, (2015). Periodic Data on the Number of Housing Units, Unpublished Data.

[11] Muhammad S. A., (2010). *Geography of Cities*, Al-Mustansiriya University, Baghdad Press, 1-223.

[12] Al Touma H. S., (2014). Cartographic Analysis of Population Distribution in Al-Amil Quarter. *Al-Ustad Journal for Humanities and Social Sciences*, Vol. 1(209). https://search.emarefa.net/detail/BIM-379135

[13] Al-Ajili M. S., (2008). The Effect of Random Change of Land Uses on the Basic Design of the City of Baghdad. *Journal of the College of Education, Al-Mustansiriya University*, Vol. 2 (4). http://search.mandumah.com/Record/426775

[14] Samarra Municipality Directorate, (2015) Property Department, Unpublished Data.

[15] Sabah, H. G., Riyadh, A. A. and Bashir, I. A., (2014). The Urban Environment Problems in Iraq (Baghdad as a Model), *Sir Min Ray Magazine, Samarra University, College of Education*, Vol. 10(39). https://search.emarefa.net/detail/BIM-745852.

[16] Mazen A. A., (2013). *Geography of Services*, College of Education, University of Anbar, Arab Society Library, 1st edition. 17.

[17] Samarra Municipality Directorate, (2017). Results of a Field Survey of the Reality of Road Services within the City of Samarra.