

URBAN EXPANSION INTO AGRICULTURAL AREAS AND ITS ENVIRONMENTAL IMPACT ON THE CITY OF KUFA STUDY AREA: "AL-SADR DISTRICT...THIRD"

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Abstract

Interest in land use surveys has grown as it has become clear that many economic, social, and urban problems are directly and indirectly linked to land, such as environmental degradation. Land use surveys and planning have become the scientific method for overcoming these problems and finding appropriate solutions. Population growth and increased urbanization are hallmarks of Najaf, leading to numerous problems, most notably housing and the city's inability to provide housing for its growing population. With increasing congestion in the city center, urban expansion toward the outskirts has begun. This expansion in these directions has resulted in the loss of vast areas of agricultural land. This research aims to study the phenomenon of urban expansion and the resulting shrinkage of agricultural land, in addition to the negative effects that have begun to appear on the environment at a time when there is an urgent need to increase agricultural production. The research reached a set of results and recommendations that the increasing severity of contemporary environmental issues and the aggravation of their effects in recent times have drawn attention towards the interest in environmental research, study, analysis and evaluation, to identify the importance of the environment, its function and the system of its components, to uncover its secrets and learn how to deal with it in a rational manner that achieves its maintenance, protection and stability in order to ensure the future of the path of life. Due to the increasing danger of environmental systems, science has turned to focus on land use planning due to the urgent need for this type of planning that works to organize and control land uses and direct them to satisfy the needs of the population and overcome the problems they suffer from. Population growth and the increasing rate of urbanization are among the major environmental pressures that threaten the ecosystem. Overcrowding leads to the emergence of many problems, foremost among which is the problem of urban sprawl towards agricultural lands. This problem is limited to the city's inability to provide housing units for the increasing number of residents in terms of quantity and quality. With the increasing congestion in the city center, the process of expansion towards the outskirts began. This expansion in these directions caused the loss of large areas of agricultural land, and its repercussions began in an unsettling manner on agricultural lands. The changes that occurred greatly altered the appearance of the landscape, in

addition to the negative effects that began to appear on the environment as a result of the disruption of the ecosystem and the elimination of natural resources necessary for agriculture, such as soil and water, at a time when there is an urgent need to increase agricultural production to meet the growing demand for food, which necessitated more attention and studies for planning rural and urban settlements.

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THE INTRODUCTION

The agricultural sector is one of the most important economic sectors in most developing countries in terms of its contribution to the gross domestic product (GDP) and the job opportunities it provides. The agricultural sector employs a relatively large number of the total workforce, making it a major source of income for a large number of the population. It also meets food consumption needs and contributes to stimulating the manufacturing industries by supplying them with production inputs. Furthermore, the agricultural sector surrounding cities is considered an important element in achieving self-sufficiency in agricultural products at the lowest cost. Agricultural lands surrounding cities, including the city of Kufa (study area: Al-Sadr 3 neighborhood), are gradually decreasing day by day as a result of urban sprawl (urban expansion) towards agricultural areas. Population growth is putting increasing pressure on agricultural lands through the construction of roads and the establishment of facilities and commercial activities on these roads. The lack of proper urban planning also contributes to urban expansion at the expense of agricultural lands.

The planning process generally aims to develop the city and make it meet the various needs of citizens. Residential areas and neighborhoods constitute one of these basic needs of the city. With the rapid and unusual growth in the size of cities, especially in developing world countries, which is often embodied in capitals and cities that enjoy religious, economic, or political importance, the executive authorities have been unable to absorb the population increases that have occurred as a result of numerous reasons, including political, economic, social, and religious ones.

As a result, the research problem is: There is an acceleration in urban expansion and various residential, service, health and industrial uses at the expense of agricultural lands. This has led to a decrease in the size of cultivated areas in the study area. In light of this, the following questions can be raised:

- 1_ Does the unplanned urban expansion in Kufa district have an impact on the use of agricultural land there?
- 2_ Does the high population growth have an impact on urban expansion on agricultural land in the study area (Al-Sadr 3 neighborhood)?

While it was **Research hypothesis:** The research hypothesis is based on the fact that urban expansion resulting from population growth and poor planning has an impact on agricultural land use in the study area.

The research objectives were: The main objective of the research:

- 1- It is an assessment of the environmental impacts of urban expansion in the study area.
- 2- Finding the best ways and means to eliminate the environmental impacts resulting from the shrinkage of green areas on the population and the surrounding environment of the city.

The importance of the study and its justifications

- 1- Solving the problem of urban expansion and using modern technologies to monitor this phenomenon and provide accurate results in light of rapid urban development.

2- Draw officials' attention to the dangers of urban expansion at the expense of agricultural land to avoid planning-related problems and to take the necessary precautions.

In order to achieve the research objectives, it was divided into several axes. The first axis represents the systematic review, while the second axis represents the theoretical aspect, the third axis represents the practical aspect, and the fourth axis represents the results.

THE FIRST AXIS IS THE SYSTEMATIC REVIEW.

1- The study of researchers Kamel Al-Kanani and Ahmed Adnan Saeed (Al-Kanani, Issue 69, 2005), Urban expansion at the expense of agricultural lands (a field study of the Al-Khalidiya-Ramadi area), which dealt in the study with diagnosing the causes of the phenomenon of urban expansion in the countryside and the most important consequences arising from this encroachment on agricultural lands, in addition to the most important legal, economic, social and cultural dimensions resulting from urban expansion on agricultural lands.

2- The study of researcher Dhafer Ibrahim Taha Al-Azzawi (Al-Azzawi, Issue 22, p. 60, 2005), entitled (Urban expansion and its impact on agricultural land use in the Yathrib district), in which he dealt in his study with the stages of Urban expansion in the Yathrib district and knowing the impact of urban expansion on agricultural lands and the area expanded for residential and service uses.

3- The study of researcher Abdul Fattah Habib Rajab Al-Hadith (Al-Hadith, Vol. 16, No. 10, 2009), (Urban expansion and its impact on agricultural land use in Al-Alam district for the period (1987-2007 AD), which dealt in his study with the stages of urban expansion in Al-Alam district and the extent of its impact on the decline in agricultural land areas and the impact of that on the economic situation of the residents of the study area.

4- The study of researcher Sfax Qasim Hadi Al-Jabouri (Al-Jabouri, 2009, p. 24), which dealt in her study with the impact of urban expansion on agricultural lands and the extent of pressure on services as a result of random expansion and population pressure on agricultural lands.

5- The study of researcher Khawla Gharib Faraj Al-Maliki (Al-Maliki, unpublished doctoral thesis, Baghdad, 2011), which dealt in her study with the most important reasons and factors that led to the decline in the area of agricultural land in the city of Baghdad, while the area of residential use increases at the expense of agricultural land, which is met by a decline in the area of agricultural land.

6- The study of researcher Enas Abdul Amir Burhan (Burhan, unpublished master's thesis, Babylon, 2011), which addressed in her study the shedding of light on the characteristics of the natural and human environment and the most important determinants influencing the drawing of urban expansion trends in the city of Al-Qasim.

THE SECOND AXIS IS THE THEORETICAL ASPECT.

Urban sprawl:

Urban sprawl is a general, multifaceted concept that refers to the expansion of a city and its suburbs at the expense of surrounding land and areas. This phenomenon leads to the gradual development of rural areas adjacent to large cities and a gradual increase in their population density. It also helps raise the level of services there and causes the spread of the use of cars and modern means of transportation on a wider scale. The definition of the term urban sprawl is not very clear, and it raises many debates about the exact meaning behind it. Some define it as the expansion of urban facilities at the expense of agricultural lands allocated for exploitation and agricultural production, while others measure it, for example, by the average number of housing units per acre (acre) (which is a unit of volume for measuring the area of agricultural land and is equivalent in Arabic to the feddan, and every 1 acre = 4050 square meters, no more). Others measure it according to decentralization, the expansion of population centers without a reference in their expansion to a clear center from which they start and

expand in other directions, technological development, the abundance of services, and the phenomenon of urban desertification threatens about 110 countries in the world, and more than 19 billion hectares of the world's land are threatened by desertification. Hence, this phenomenon has become a challenge for most countries in the world, especially developing ones, which are increasing. Its population is growing at a high rate, and the resulting pressure on resources, especially agricultural lands surrounding cities, makes it imperative for countries to initiate scientific planning to limit its negative impact on the environment and the biological systems surrounding residential areas. (Environmental Encyclopedia, 19[5]2013)

The phenomenon of urbanization, i.e. the concentration of population in cities, has increased significantly. At the beginning of the twentieth century, less than 5% of the world's population lived in cities. This percentage rose to more than half of the world's population in 2000 AD, with the percentage of urban residents reaching 52%. Current statistics indicate that there are more than 281 cities with populations of more than one million people. (Abu Subha, Geography of Cities, 2003, p. 69)

Statistics indicate that agricultural rural areas are witnessing a decline in soil fertility due to the decrease in the number of farmers in 1980 from 10.4% to 6.3% in 1989. (Fawzi, Introduction to Geography, 2002, p. 185)

The impact of urban sprawl on agricultural land may contribute to soil, water, and air pollution due to pollutants from various sources, which tempts owners to sell them. (Aboudia, Environmental Science, 1994, p. 226)

Water moves through the system, forming rivers, swamps, and seas, as well as groundwater layers and clouds. Living organisms, including plants and animals, as well as humans and their various activities, are an essential part of this system, contributing to the changes that occur within it through the activities they carry out. (Othman, 3rd ed., 2005, p. 137)

Transportation also plays an important role in the encroachment of urbanization on agricultural lands through the construction of roads and the establishment of factories, facilities and commercial activities on the sides of these roads, in addition to the lack of proper planning in cities, which helps urbanization expand at the expense of agricultural lands. (Saleh, 1986, p. 63)

Ultimately, the goal of planning was to develop and prepare national urban plans by the National Urban Planning Agency as an attempt to structure the competing demands for the country's scarce natural resources, especially its large agricultural lands. (Fredman, 1963, p64)

India has used regional planning for a long time, beginning in the late 1940s when acute development problems arose in major cities and their neighboring regions. Regional planning in India was characterized by an attempt to define land use, but later transformed into an attempt to define the relationship between economic and urban planning (Saleh, 1986, p. 63).

THE THIRD AXIS IS THE PRACTICAL ASPECT.

Al-Sadr 3 district is one of the districts of the holy city of Kufa and is located in the south of it near the Euphrates River (Shatt Al-Kufa). It is bordered by Kufa-Najaf Street and Maytham Al-Tammar Street. Kufa is one of the Iraqi cities affiliated with Najaf Governorate and is located on the middle Euphrates River to the west, 170 km south of Baghdad and 10 km northeast of Najaf. Kufa is located between latitudes (32°21' (29°50') north and longitudes (44°44' (42°50')). The city is about 22 meters above sea level and is bordered to the north by Al-Kifl district (Babylon Governorate), to the east by Al-Sunniyyah and Al-Salahiyah districts (Diwaniyah Governorate), to the west by Kari Saad, and to the south by Abu Sakhir district and Al-Hirah district. As shown in Map (1), (2) and (3)

We conclude from the questionnaire that the number of males is greater than the number of females, as the percentage of males reached (53%), while the percentage of females reached (47%).

Table No. (1) shows the percentage of males and females in the region.

percentage	number	Sex
53%	80	male
47 %	70	feminine
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question 2:

The questionnaire showed that the youth category in the region is large, as the percentage of people aged between (18-30) reached (57%), while the percentage of people aged between (31-40) reached (23%), and the percentage of people aged between (41-61) reached (20%).

Table No. (2) shows the ages of the residents of the study area (Al-Sadr 3 neighborhood).

percentage	number	Ages
57%	85	18_30
23%	35	31_40
20%	30	41_61
100%	150	the total

Source: Researcher based on the questionnaire.

Question Three: The questionnaire form showed that the cultural level in the study area is not bad, as the percentage of high school diploma holders (preparatory - intermediate) reached (50%), while we find that the percentage of (20%) is for those with a bachelor's degree, while the percentage of those with an elementary school diploma reached (27%).

Question Four: It became clear from the questionnaire form that the population's opinion on the subject of the state of the environment is that the majority believe that their environment has become worse, as

percentage	number	Academic achievement
20%	30	Bachelor's
50%	75	High school
27%	40	Elementary
3%	5	Other
100%	150	the total

their percentage reached (87%), which indicates the deterioration of the environmental situation, and a small percentage, amounting to (13%), believed that it has become better as a result of their lack of environmental awareness.

Table No. (4) shows the condition or status of the environment.

percentage	number	Environmental status
13%	20	better
87%	130	Worst
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question Five: It became clear from the questionnaire that the vast majority believe that humans are responsible for the changes occurring in the environment, reaching (94%), and that a very small number believe that natural forces are responsible for this change, reaching (6%).

Table No. (5) shows the reasons for changes in the environment.

percentage	number	Causes of environmental changes
94%	145	man
6%	5	natural forces
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question Six: The questionnaire showed that a large number of the region's residents, amounting to (53%), rated the environment as bad, which indicates the environmental awareness of this group. As for those who rated the environment as acceptable, their percentage was (37%), while a small number of residents, amounting to (10%), rated the environment as good, which is evidence of the weakness of environmental awareness of this group.

Table No. (6) shows the environmental assessment in the study area.

percentage	number	Evaluation
0%	0	Excellent
10%	15	Good
37%	55	Acceptable
53%	80	Bad
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question Seven: It became clear from the questionnaire that a large number of residents of the study area believe that the problem of urban sprawl causes a major problem, and their percentage reached (81%). This indicates their environmental awareness of the importance of preserving areas. A small percentage of the area's residents, compared to the first percentage, believe that the problem of urban sprawl causes a minor problem, and their percentage reached (19%). This indicates the existence of more complex problems in the current exceptional circumstances, so they considered it a minor problem.

Table No. (7) shows the type of problem caused by urban sprawl on agricultural areas.

percentage	number	Type of problem
81%	121	big problem
19%	29	Minor problem
0%	0	No problem
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question 8: It is clear from the questionnaire that a large percentage of the population, amounting to (83%), believes that there is a great danger threatening people as a result of the poor environmental conditions resulting from urban encroachment on agricultural areas. There is a percentage of the population, amounting to (14%), who believes that the danger threatening people is small, and a very small percentage, amounting to (3%), believes that there is no danger worth mentioning. This indicates the weakness of environmental awareness for this group of residents of the study area.

Table No. (8) shows the type of danger that threatens people when environmental conditions deteriorate.

percentage	number	Type of risk
83%	124	great danger
14%	22	small risk

3%	4	No risk
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question 9: A large percentage of the region's population, reaching (77%), supports measures to preserve agricultural areas by establishing a strategic process to preserve agricultural areas and setting stricter laws to limit encroachments on agricultural areas. As for those who oppose, their percentage reached (23%), and this is an indication that this group of people supports personal interest rather than the public interest, as establishing such a strategy threatens their presence in these encroachments.

Table No. (9) shows the population who support and oppose the process of preserving agricultural areas.

percentage	number	Residents' answers
77%	115	supporters
23%	35	Opponents
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question 10: The questionnaire revealed that the number of residents who believed that civil society organizations concerned with protecting the environment and agricultural areas had a major role in solving problems declined by 63%, while the percentage of those who answered that they had no role was 37%. We conclude that the role of the organizations is currently unclear because it is new and has not given them the opportunity to prove their true role in the field of environmental protection.

Table No. (10) shows the role of civil society organizations in preserving agricultural areas.

percentage	number	Residents' answers
63%	94	Yes
37%	56	no
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question Eleven: It became clear from the questionnaire that the vast majority, which amounted to (83%), believe that local authorities should work more to protect agricultural areas due to their important role in the environment. This is evidence of the importance of agricultural areas in the eyes of the population. As for the population who tended towards less protection, their percentage amounted to (17%). This indicates a lack of understanding of the role of municipal departments in preserving agricultural areas or their ignorance of the importance of agricultural areas.

Table No. (11) shows the role of the city (municipal departments) in protecting agricultural areas.

percentage	number	Do you think your city does?
83%	125	more
17%	25	less
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question Twelve: It became clear from the questionnaire that (98%) of the population said that there is encroachment on the study area (Al-Sadr 3 neighborhood), while (2%) of the population answered no, and this is evidence of their lack of awareness and weak environmental consciousness.

Table No. (12) shows whether there is urban encroachment on the study area.

percentage	number	Is there urban sprawl?
98%	147	Yes
2%	3	no
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question 13: Most of the answers were about the actual need of the population for construction, as their percentage reached (27%), and this is an indication of the weakness of their economic situation, which pushed them to live in slums. As for the answers that were answered as illegal violations by citizens, their percentage reached (37%), and the percentage of people who answered that they were ill-considered decisions by the state reached (31%), and there was a number of residents who answered otherwise, meaning that they had their own reasons, and their percentage reached (5%).

Table No. (13) shows the reasons for urban sprawl in the study area.

percentages	number	the topic
31%	46	ill-considered decisions by the state
27%	40	Real need for urbanization from citizens
37%	56	Unlawful transgressions by citizens
5%	8	Other
100%	150	the total

Source: Researcher's work based on the questionnaire form

Question Fourteen: The percentage of people who believed that the negative environmental effects caused by urban expansion are effects on the aesthetic aspect was (20%), which indicates their interest in the aesthetic aspect. As for those whose answer was increased air pollution, their percentage was (24%), while a large number answered with effects on the climate, as their percentage was (36%), which is the largest percentage. As for the smaller percentage, they answered with other environmental effects, and their percentage was (8%).

Table No. (14) shows the most important negative environmental impacts of urban expansion on agricultural areas.

percentages	number	the topic
24%	36	increased air pollution
20%	30	Effects on the aesthetic aspect
36%	54	Effects on climate
12%	18	Land degradation
8%	12	Other environmental impacts
100%	150	the total

Source: Researcher's work based on the questionnaire form

AXIS IV: RESULTS

1- The city of Kufa contains many regular neighborhoods that provide all the necessary services for living, but with the increase in population and the high growth rate in Iraq in general and the city of Kufa within it, and the improvement of the economic situation and the desire of every family to own a home of its own, in addition to the rise in housing prices as a result of the absence of government oversight and neglect of the housing sector by the government and the lack of support for it, many residents were forced to encroach on state property and establish settlement outposts distributed in the

south, center, north and east of the city of Kufa, giving the city a distorted appearance from an urban perspective and negatively impacting the environment due to the pressure it creates on the land and the depletion of resources, in addition to the waste that is thrown out of homes, pollution and other things.

2- Much of the ownership of green and agricultural lands within the master plan of Kufa city belongs to the Ministry of Finance. As a result of weak legislation and laws, citizens have resorted to encroaching on state-owned lands.

3- There is an increase in urban sprawl on agricultural lands in the city of Kufa, and this was observed through mapping the study area.

4- The main reason for urban sprawl is the increase in population and the shift away from agricultural work, which has led to the neglect of land, its sale and its use in construction.

5- Urban sprawl has led to the neglect of agriculture, resulting in the loss of many of the city's crops and a reliance on imports to meet the city's food needs. This threatens the city's food security.

6- The absence of the role of agriculture in warning of the dangers of this encroachment, and in encouraging the investment of lands and planting them with crops to meet the population's need for vegetables and other crops.

7- The municipality and local authorities do not play an effective role in guiding citizens away from building on agricultural land.

8- By studying the climate characteristics of the study area, it was found that its climate is characterized by high temperatures during most seasons of the year. Urban expansion on agricultural lands and converting them to residential areas will contribute to making the climate temperature in the study area higher. This is because green agricultural lands contribute to moderating temperatures. This will also affect wind speed and humidity levels in the study area.

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