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Green City Shield

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Abstract. The current study highlighted the violations and the steady depletion of , and agricultural and green areas in and around cities , which is an accurate scientific research problem that affects the future perspectives of these areas, their production and their consequences for the life of cities and their vital surroundings. This research took Baghdad city as a model of this critical phenomenon in order to study the reality of these regions, the size of violations, and to set a future concept and strategy, in addition to the proper treatment that preserves the assets of this great wealth , It was one of the most important conclusions Urban planning disruption of Baghdad city formations ,One of the most important recommendations , Scaling Baghdad city demographically and expanded spatially .

1. Introduction

The agricultural, green, and open areas are considered to be the lungs of the city through which they breathe, cool their atmosphere. The city's vegetation contributes to improving the quality of its air and providing the city with its food needs, saving it economically and environmentally by providing it with shade, reducing brightness and heat on exposed surfaces, and maintaining suitable temperatures since the lack of the green area causes thermal islands. As well as, these areas enhance natural ventilation areas, reduce pollution, reduce noise levels, improve the quality of life and public health in the city, and communicate with nature and enhance the aesthetics of the city. Furthermore, these areas suffer from several problems, the most prominent of which are urban growth and population increases, which are extended over these regions and ecological regions, and these expansions with an infrastructure that increases pollution, the collapse of the surrounding natural system and the drying up its resources. Baghdad city witnesses a dangerous deterioration in its urban environment and a severe drain on its green shields represented in agricultural areas and green spaces through illegal irregularities, illegal changes, legal irregularities and changes in agricultural and green land uses in the city planning, accompanied by spatial structural changes in the city shape.

2. Materials and Methods of Wirks

The researcher adopted a comprehensive survey with quantitative, qualitative data on the study society, which is represented in the agricultural areas and green areas in and around the city. In addition to illustrating the depletion of these areas legally by changing the land uses, illegal changes, and the main factors in these irregularities, and the impact on the city in the environmental, economic, social and physical aspects, as well as the effect of decision-makers in the city to alleviate or exacerbate this problem. Agricultural activity is the country's second GDP after oil, where lower levels of agricultural efficiency within the country compared to the overall rate of agricultural efficiency in the Arab countries, are evidence of the deterioration of the agricultural sector and workers and the weakness of the agricultural production policy, despite the suffering of some countries



from water scarcity, poor soil condition and the lack of resources, including financial resources , in addition to the fragmentation of the agricultural ownership between generations that create a small agricultural areas, making the exploitation of these small areas economically ineffective for farmers, which caused to leave many un-invested and unproductive agricultural areas. Furthermore, the lack of support and governmental protection for this sector can consider as the main reason for the abandonment of investment of this wealth that ensures the food security of the country. Finally, the preference of farmers to divide and seal these areas as housing blocks because of the rapid and abundant gains, commensurate or ignorant of the disastrous effects of these practices on the agricultural sector, the urban environment, economic balance and social disintegration

3.The difficulties and challenges of the agricultural sector and green areas

They can be classified as follows:3.1. social impact , 3.2 Legislative and legal application of laws that affected agricultural and green areas , 3.3. Loss of government support to the sector and its development .

3.1. Social Impact :

The social impact on the urban environment of the city of Baghdad and the agricultural sector was the most negative factor in the city, where the waves of un-planned and inadequate human migration coming to Baghdad during previous periods of time have a catastrophic impact on the city , A large number of farmers have been left an enormous agricultural area of their land amounted to 850.00 dunums of which 290.00 dunums of salted lands are part of larger salted areas not treated and left[1] , which encouraged farmers to divide them and changing it to urban uses Moreover, the agricultural sector has suffered from several setbacks, not only affects agricultural activity and its workers themselves, but also the numbers of farmers who will be on the job market, which affected on this market that already suffer from serious problems, thus destabilizing the economic balance of the country as a whole, thereby losing two directions. The aggravation of these problems was the result of the steady continuation of the spatial disparity between Baghdad and the rest of Iraq's cities in general, the agricultural sector and the rural and urban environment in particular, where the degree of deprivation in urban areas reached 17% while it exceeded 58% in rural areas [2] , This reality strengthens and reinforces the phenomenon of imbalance and duality of spatial development between the city and the countryside, and between Baghdad and the rest of the cities in Iraq, which leads to deterioration of the rural reality that increasing the migration ratio of rural to city, causing two-way damage to the agricultural reality and the urban environment.

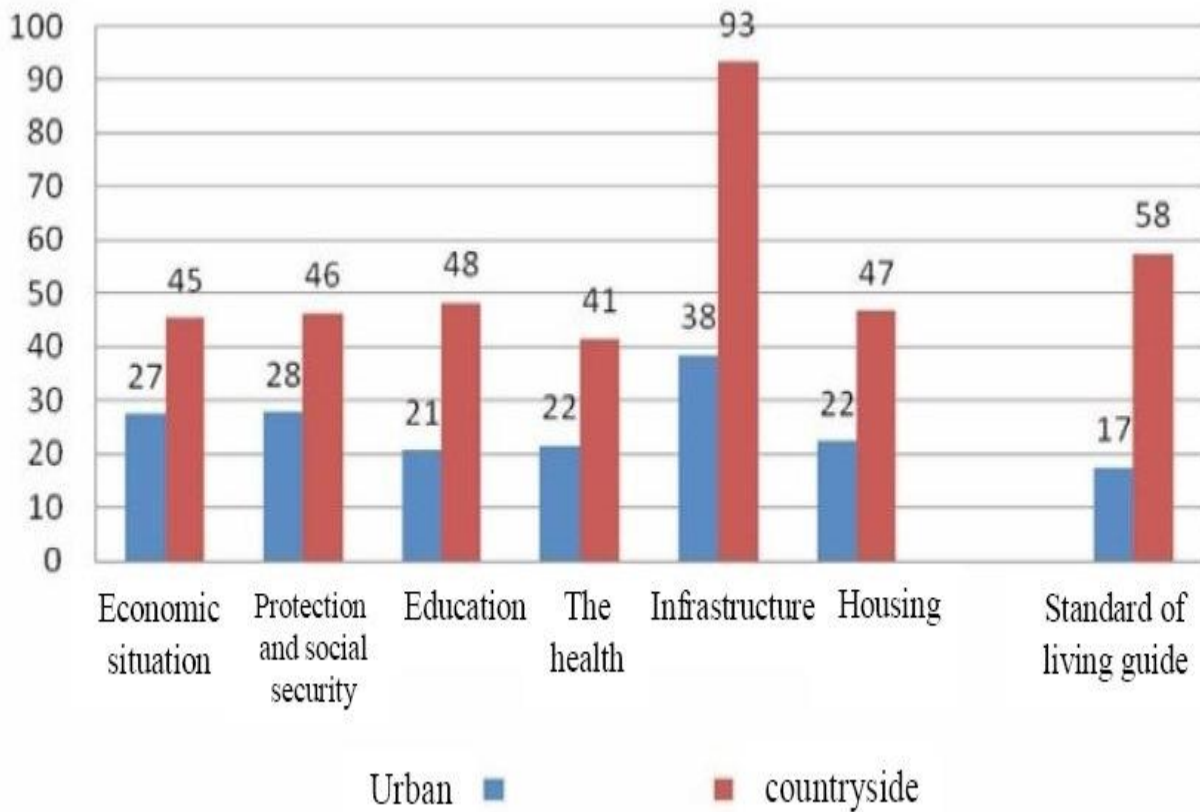


Figure 1. Spatial variation between urban and rural by indicators of deprivation in social and economic fields [2].

The population is increasing of Baghdad city from the period (1966 to 1973) was not the result of the natural increase of the population, but the migration from the cities of Iraq to the city of Baghdad had a major role in the population increase, as the percentage of the increase of the immigrant population was 88% of the city of Baghdad from the net total migration. The majority of these migrants are from rural areas and workers in the agricultural sector, and are in active working age between the ages of (15 - 60 years) , which represents about 85% of the migrants and the rest, 15% distributed among those under 15 years and over 60 years. Where migrations since their early periods in 1947 or earlier affected the agricultural sector, which led to a decline in the rate of agricultural production in Iraq due to multiple causes of migration, including clan-based conflict, family problems and the economic situation[16] [3] [17] , This was a very high percentage of migration to a relatively small city of the size of a Baghdad city, with an area of 4555 km², which represents only 1% of the area of Iraq [4] [5] These numbers are dangerous on both sides in Baghdad city and cities from which emigrants offered that they lost a big percentage of their citizens in the economically active construction of work, as shown in Table 1.

Table 1. The net migration volume of Baghdad city from 1957 to 1977(Researcher, based on Ministry of Planning data / Regional Planning Authority for multiple years [17].

year	Total number of immigrants between the cities of the country	The number of emigrants to Baghdad	is the ratio of the number of emigrants to Baghdad from all over the country
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1957	378.877	304.908	%80.4
1965	613.113	540.294	%88.1
1973	774.700	685.000	%88.4
1977	922.077	725.013	%78.6

The migration rate of the rural and agricultural area’s population of the city has increased more than threefold over the past two decades [6]. According to the population growth formula applied by the researcher for the base year at present 2019, the current population of Baghdad is 8.340.711[18] , While the target year is 2030 , the population of Baghdad will exceed eleven (11.000.000) million people , which exceeds the city's ability to meet urban standards and the needs of these inflated numbers will be met at the expense of the green, agricultural and open areas, and the currently slums in the city, most of which are concentrated on these areas, constitute additional burdens on these areas. It is worth noting that the slums of the previous decades have become a reality and extended cities, and this operation continues today, where the Baghdad city has gained greater numbers on the level of Iraq, as the number of improvised housing units in Baghdad is 136,689, by 26.2% of the improvised housing units all over Iraq,. Moreover, the number of unauthorized squatters is 1,022 in Baghdad by 27.7% of the percentage of unauthorized squatters in all Iraq in 2019 [7] and [8] as shown in "Figure 2" These numbers are constantly increasing over the agricultural, green and open areas, which has disastrous effects on urban life in the city as shown on the Figure 2 and Figure3

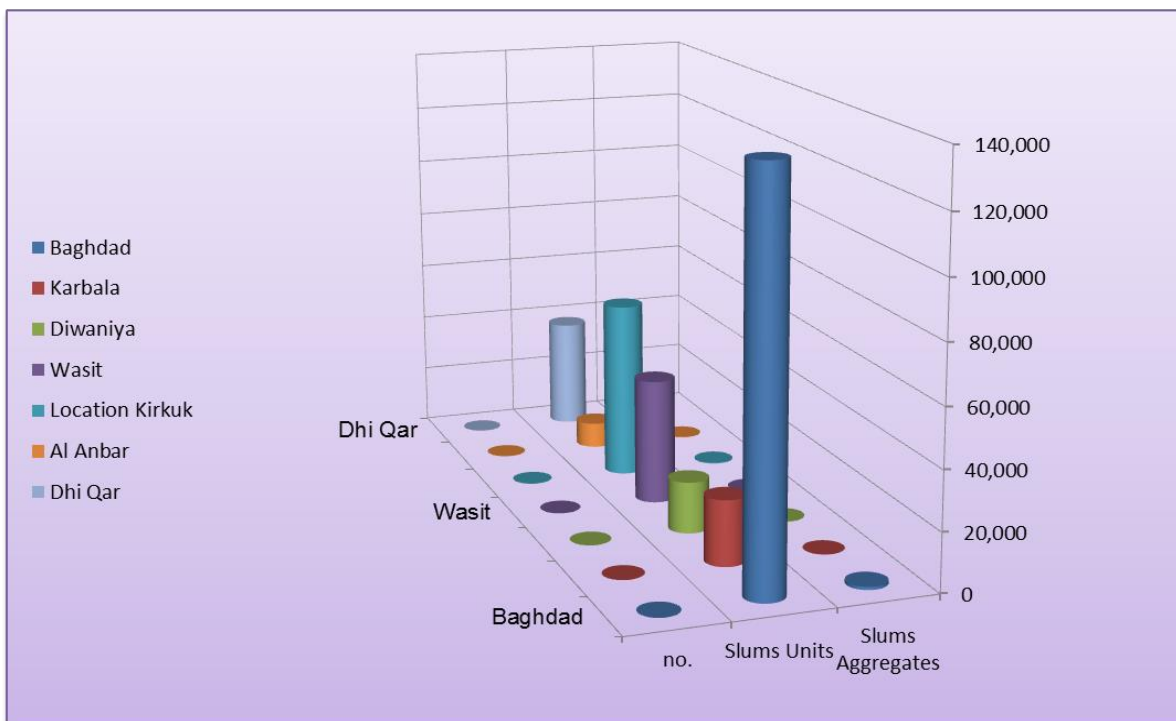


Figure 2. The number and sizes of unauthorized squatters improvised housing units for few Iraq cities (Researcher. based on Ministry of Planning data)



Figure 3. The unauthorized squatters over green, agriculture and open areas [16].



Figure 4. Map 4 Comprehensive development plan transverse on satellite picture

In addition to that, the society and its behavior toward the agricultural areas have caused a great damage that reflected on the human being’s health. The over-exploitation of these areas causes phenomena such as desertification, increased dust storm, land degradation and natural

imbalance, resulting in the removal of vegetation cover, soil erosion and dislocation, and the formation of huge areas free of natural fenders and obstacles that reduce wind intensity and speed, making them areas of dust release. According to the latest world health organization (WHO) reports, where it found that airborne dust is directly related to vascular disease, where the deterioration of air quality, including the dust storms, caused the death of 7 million people annually in the world, these storms increased within the past decades accompanied by a high rise in the number of people suffering from allergy and respiratory diseases. The Iraqi Ministry of Health recorded increases in these cases by 205722 cases in 2010, 268984 cases in 2011m and 24410 cases in 2012. Furthermore, dusty days increased to four consecutive days, and the number of days has increased to between 200 and 220 days a year, and sand has been drifting towards strategic projects, including irrigation, agricultural and roads, causing a deterioration in these projects and areas and low levels of visibility below 5 meter [9] . Where the annual increasing rate of pollutant concentrations in the Baghdad air was shown in Table 2.

Table 2. The annual rate of concentrations of pollutants in the surrounding air within the urban areas (Baghdad City) : (Researcher, based on Ministry of Planning data, The priority environmental and sustainable development indicators in Iraq)

Year	Suspended dust particle in the air of Baghdad city* s
2014	527.8
2015	373.5
2016	381.0
2017	822.0

Note: The proposed national limit for accumulation of suspended dust particle ($350 \mu\text{g}/\text{m}^3$) [10] .

3.2. Legislative and Legal Impact :

It was mentioned previously the illegal violations over agricultural and green areas, while in this section, the legal law issued during the previous period was investigated to show their effect on our goal of study. Starting with the road and building system No. 44 of 1935, which created an imbalance and disparity in the distribution of green areas within the city, then came the basic design law of Paul Service Company No. 156 of 1971, which did not solve the imbalance, where the article 16 of this law noted that “Agriculture, horticulture and green areas within the city limits may establish buildings and construction works for their purpose and establish housing at the rate of housing per 5 dunums without specifying the area of construction”, while the second article from the same law was allowed for the establishment of housing complexes and buildings for agricultural activities. Regional planning made no difference from previous laws, where Decision 222 of 1977 authorizing the secretion of orchards and agricultural lands and changing their use from agricultural use to other uses. Moreover, Decision No. 573 of 1977 authorizing the spontaneous replacement of land of the same value, as well as Decision 850 of 1979 that related land secretion and division. Decision 581 of 1981, on the approving the ownership of orchards and agricultural lands for which non-agricultural uses are decided within the basic design, decisions of the Mayoralty of Baghdad No. 1-2-3-4-5-6-10 in 6-11-1982 to change the land from green and agricultural to residential. The 1983 decision, according to which the Mayoralty of Baghdad converted the

Change uses of 230 streets to commercial ones and eliminated open spaces and gardens. Decision No 1178 of 1983, which authorized the construction of residential units in the agricultural areas at a size of 300 square meters, and did not specify the number of units constructed. Decision No. 297 of 1987 that permits the building of housing for all farm children, and Decision No. 940 of 1987, Decision No. 286A of 1987, Decision No. 51 of 1989. Decision No. 20 of 1998[11], as well as Decision No. 117 of 2000 of 12331 dunums [12], which changed its use of agricultural, green and open to residential as shown out in the "figure 5".

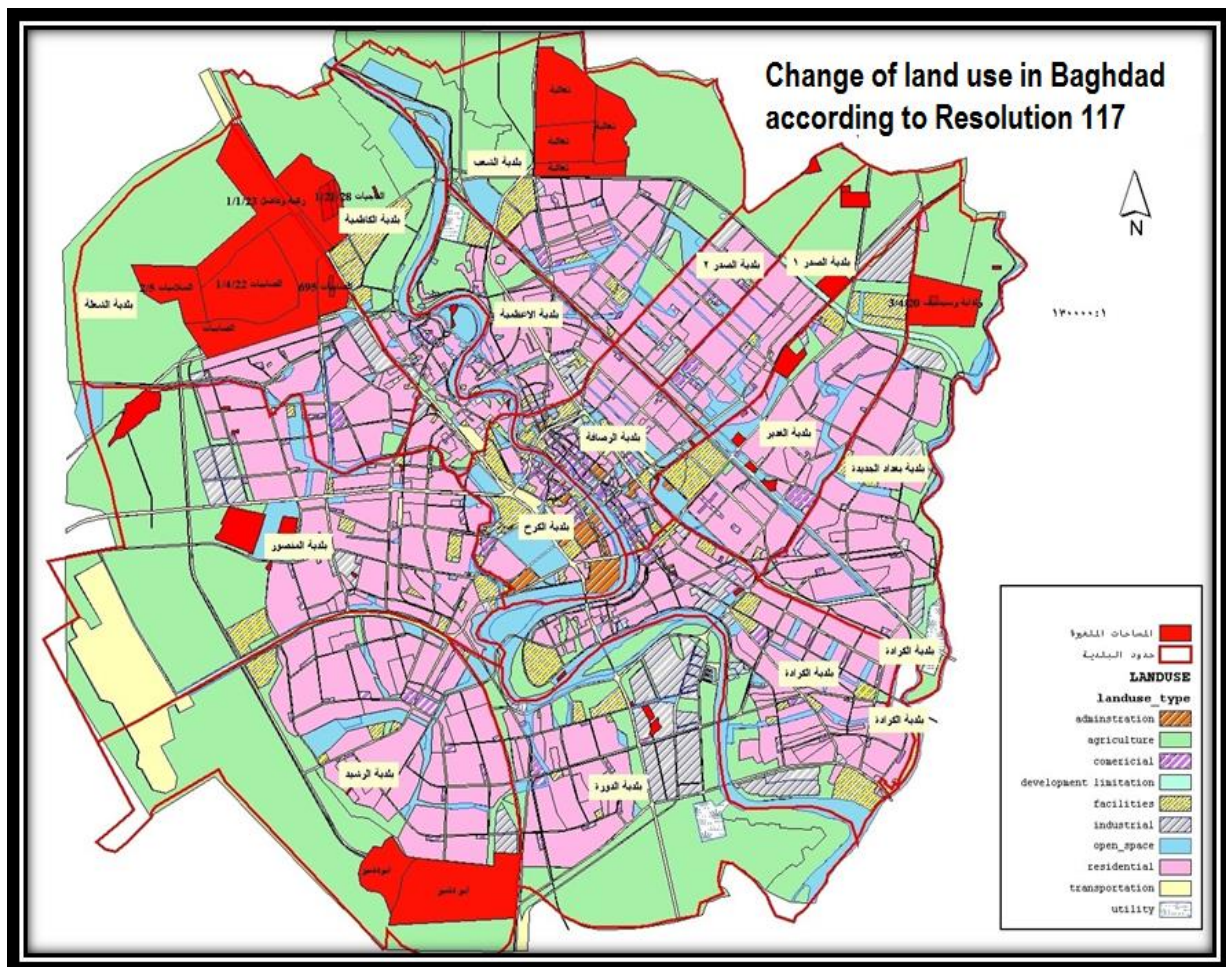


Figure 5. Map of agricultural and green land use change, according to Mayoralty of Baghdad Decision 117, Design Department, GIS Geographic Information Section

Changes in the use of the land of the Higher Committee for the Base Design of the city of Baghdad, which did not take into account the future comprehensive development plan, which may conflict with the uses of the land for the planned future period. Some agricultural or green areas were essentially found to be adjacent land for industrial or contaminated areas, so their existence is to create a kind of environmental balance in the city, but if these areas are changed,

the environmental degradation and pollution increase. During the 15 years from 2004 to 2018, a change of use was counted for more than 25689 dunums by the researcher for agricultural areas, orchards, green and open to other uses, while the researcher has not obtained all the variable spaces in order to have a clear indication of these changes. The change was at the rate of 1712.6 dunums in the year [13] , as shown in "Figure 6" and "7"

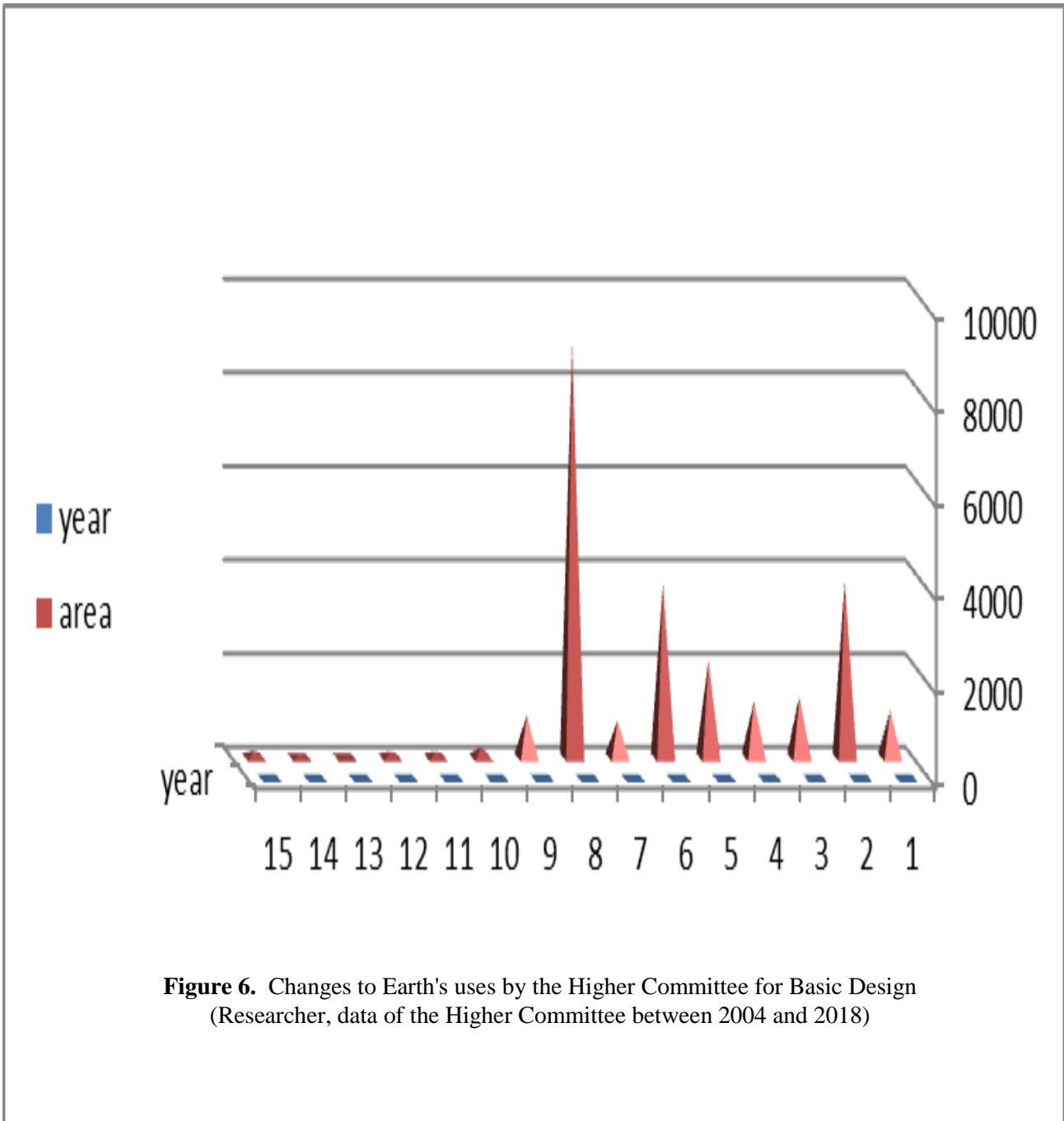


Figure 6. Changes to Earth's uses by the Higher Committee for Basic Design (Researcher, data of the Higher Committee between 2004 and 2018)

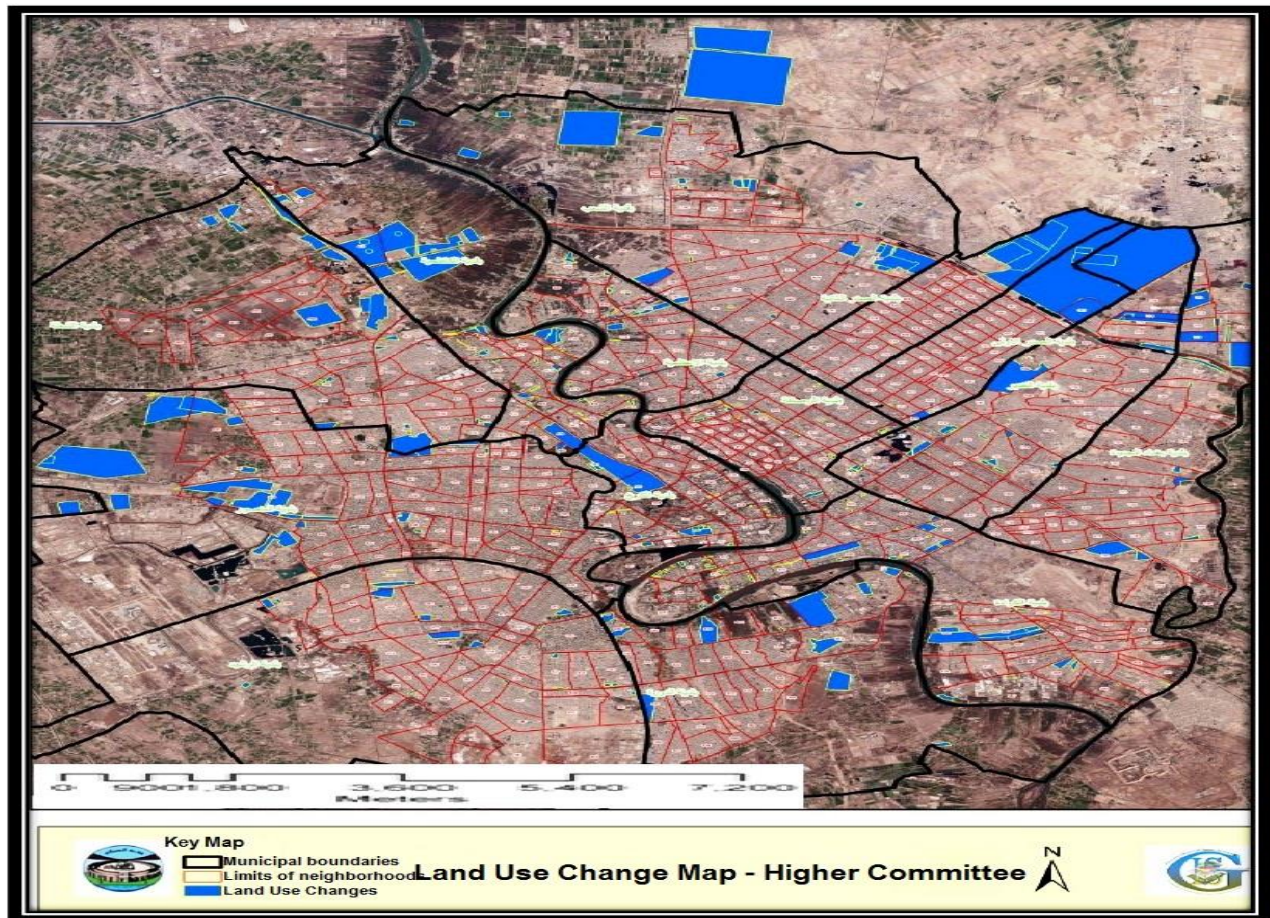


Figure 7. Map of agricultural and green land use change, Mayoralty of Baghdad, Design Department, GIS Geographic Information Section

3.3. Government Support Impact :

In spite of the importance of agriculture by providing the country's needs and enhancing food security and its contribution to Iraqi domestic output by a total of 14% between 1990 and 2014 , This sector suffered from neglect, inadequacy and lack of support from the government, as the agricultural sector suffers many problems, including desertification and salinization as shown in Table 3. As well as, low levels of water adequacy, low levels of efficiency of agricultural workers, climate change and low reliance on scientific methods and methods in agriculture and inefficient use of resources, where the planted area in Baghdad governorate is 728,749 dunums, and the arable area is 121,1630dunums[14] .

Table 3. The area of desert lands, threatened with desertification, sand dunes and salinized land (dunums) in Baghdad city, 2017

Desert lands	Land threatened by desertification	Salinized land
87.973.6*	414.612.0*	73.227*

Note: these data were calculated by the researcher based on data from the (Ministry of Agriculture, Planning Department; Ministry of Planning, Environment Statistics Department, Central Statistical Organization) [10] [5] [8] .

The process of rehabilitating soil and land affected by desertification is one of the most difficult processes, in the opinion of the scientists concerned. Therefore, it is necessary to preserve soil and agricultural areas before they deteriorate and seek to remove the causes of degradation and desertification, The strategy of sustainable development of agricultural and green areas and the development of green assets must be pursued. Sustainable agriculture provides 5.6% of the country's GDP because of the protection of environmental resources, water productivity and the raising of public health standards [6], The use of green buildings within the city and the transformation of traditional green buildings contribute to solving part of the problem of urban unemployment, creating new cadres and expertise in the field of the urban environment, renewable energy, efficiency and use of energy, and promoting sustainable construction techniques [6], The protected areas, two of which are owned by Baghdad, must be preserved, including the Kasaiba reserve, 153 dunums, the reserve of Rawda Al Maha, 480 dunums [15], and the need to restore the agricultural sector through efficient investments and research and development, this step will lead to a reduction of imports by 30% in the next five year [6]. Sustainable development: The process of meeting the resource needs efficiently at present with minimal damage and cost, at a level that does not affect the sustainability of the resource to meet the needs of future generations, maintain balance and conserve natural assets of resources in order to improve the quality of life. Green Asset Development: It is the process of preserving the assets of this wealth, which is represented in the value of the soil and its components by cultivating the species and quantities suitable in the circumstances and soil suitable for them to keep them intact

4. A set of induction Indicator effect on the city's green shield in Baghdad as shown in the table [4] and table [5].

Table 4. Indicator effect on the city's green shield in Baghdad.

Indicator	Description Indicator	Measure Indicator	Results
Agricultural and green lands	Planted, arable, and uncultivated Agriculture areas, as well as green, open and unexploited areas	Change and neglect the uses of these lands	Change of 12331 dunums by decision 117. A change of 25689 dunums by the decisions of the Higher Committee
Environmental Health	Agriculture areas affected by desertification and salinization, as well as the unauthorized using	Measuring abandoned agricultural areas	850.000 dunums left by its residents and many others .879.73.6 desert lands 414.612 dunums threatened by desertification. 73,227 dunums of cultivated land
Urban Environment	Quality of life in the city with presence of agricultural and green areas	The balance between services provided and the proportion of areas of agricultural and green areas	Cultivated areas 728749 dunums. Arable areas 1211630 dunums
Community Migration	Agriculture, rural communities who have come to the city who control agricultural areas in cities other	The number, Rate and size of the migrant population	85% of immigrants are active in the working age. 88% net migration to Baghdad compared to other cities

than their cities			
The level of deprivation	The imbalance in the standard of living below the achievement line of the necessary needs	Rural and urban disparities in the availability of essential needs	The level of deprivation in urban areas is 17%, while rural areas are 58%
Improvised housing	Unauthorized area, particularly those built over agricultural, green and open areas	Number of improvised housing units + number unauthorized squatters	Improvised housing units 136.689 units, unauthorized squatters 1,022 gatherings
Community Health	Illness and health problems caused by the poor urban environment in the absence of the city's lung (Agricultural, green and open areas)	Number of cases of diseases associated with plant cover removal	The number of people suffering from allergy and respiratory diseases with increased plankton by 205.722, 268.984 and 24.410 respectively

Table 5. Quantitative assessment indicators for the practical field study in the field.

Indicator	Scientific Clarifications Knowledge
Organic fabric	The relation between Baghdad city and its organic fabric and hosting events
Natural extensions	The natural expansion of Baghdad's urban fabric and keeping up with the urban environment.
Urban planning	The effect of the urban planning of Baghdad's by hosting of the event.
Urban transitions	The urban changes of Baghdad city by hosting a huge future event
behavior patterns	The formation of Baghdad and its ability to adapt, adapt and absorb changes are a result Planned and expected events and change behavioral patterns according to this
Planning disruption	Urban planning disruption of Baghdad city formations
City structure	Harmony and interdependence between the elements of the city's environmental, social, urban and economic structure
City expansion	The possibility of expanding Baghdad city in the future outside its borders
Environmental depletion	The environment within the city's surroundings is extremely depleted and receded.
Improvised and un-authorized housing	The Improvised and un-authorized areas beyond them and their disastrous impact on the environment of the urban city of Baghdad
Baghdad's limited space	Possibility of no possibility of compensating the green areas by the limited area of Baghdad

Assembly memory	The Assembly's memory of the decision makers of the city and the extent to which they believe in the historical and civilizational heritage of the city and set the plans accordingly
Spatial development	Redistribution of Baghdad's population to other cities and its contribution to the spatial development Iraq's cities
Standards of city structure	Proportion of the population of the city of Baghdad with the area and uses of its land and the expected increase according to the criteria for the total structure of the city
Green area Efficiency	The efficiency of open and green areas in terms of area and their relationship to the urban structure of the city

The following statistical methods were used:

REGRESSION

Descriptive Statistics

DESCRIPTIVES MEAN STDDEV CORR SIG N

Correlations

Coefficientsa

Model Summaryb

Variables Entered/Removedc

MISSING LISTWISE

STATISTICS COEFF OUTS R ANOVA ZPP

CRITERIA=PIN

Residuals Statisticsa

NOORIGIN

DEPENDENT

SCATTERPLOT=(*ZRESID ,*ZPRED)

RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)

The statistical results were expressed by Histogram of all aspects of the study and expressed the final result of the field study statistically and the inability to include the study tables for the magnitude of the evidence, data and tables, so this statistical amphitheater was replaced by this Histogram.

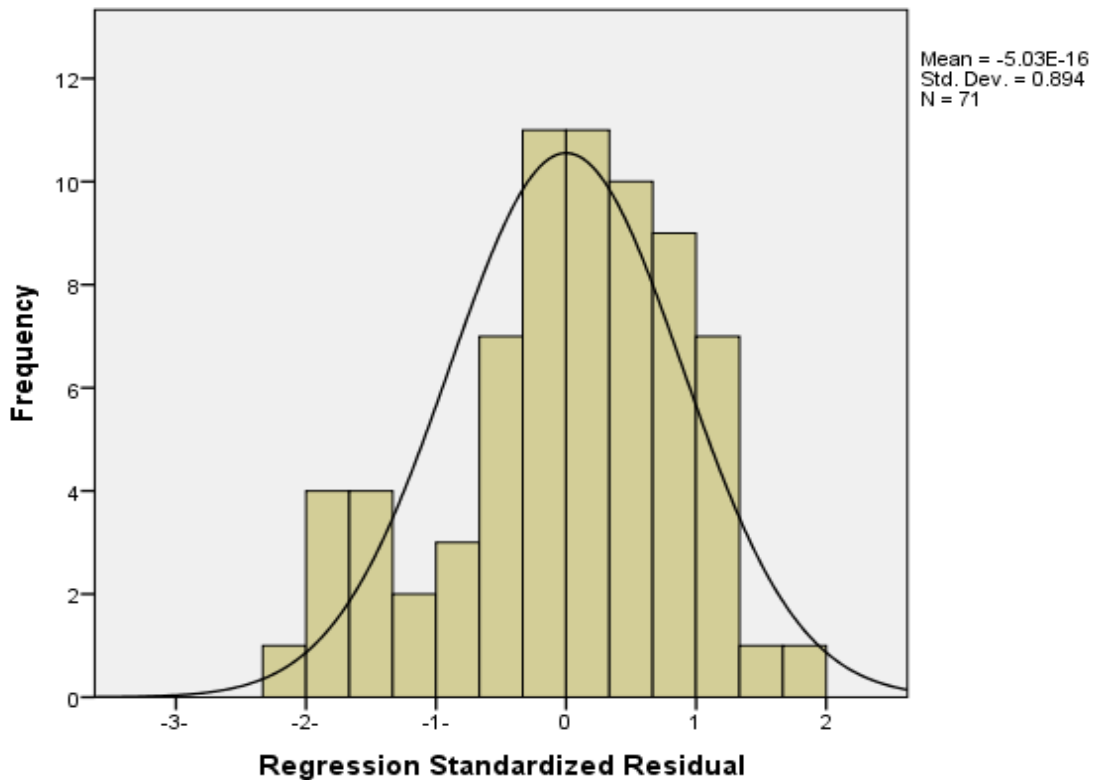


Figure 8. Statistical amphitheater was replaced by this Histogram.

This histogram refers to the weakness of the relationship and the positive linkages between the city of Baghdad and its organic fabric and the natural extensions of the urban environment in the presence of urban planning disruption in the structure of the city and harmony weakness between the elements of the city's formation (ecologically, socially, urban and economically) within the city of Baghdad. As well as, the depleting and receding of the environment within the city's surroundings, the increasing of the improvised and unauthorized areas and the absence of The Assembly's memory of the decision makers of the city importance of its historical and civilizational heritage. Furthermore, the development of strategic policies accordingly and the proportion of the population of Baghdad with the areas and uses of land to meet the standards of infrastructure and urban of the city in the presence of large population increases. Also the marginalization of the main role of the system of green and open areas in terms of surveying, distribution and numbers according to the need of the city and the link with the structure of the city, and If the situation continues as it is, we will see Baghdad, a chaos city of future. [Baghdad Future City Chaos] Finally, in order to develop a future strategy to address the problems of the future city of Baghdad, according to a strategic outlook stemming from the field study, several steps must be followed, including strengthening the organic link between the components of the city and its urban environment and the surrounding environment. New and redistribution of the population of Baghdad to other cities in the presence of spatial development in other cities and strengthening the role of other cities, planning and development and fit the distribution of material and human wealth to cities Withdrawal of great momentum from the city of Baghdad and the development of cities at the same time

5. Results:

1. Disproportionate Resource allocation of cities .
2. Urban planning disruption of Baghdad city formations .
3. The environment within the city's surroundings is extremely depleted and receded.

4. Rural and urban disparities in the availability of essential needs .

5. The spread of slums in Baghdad city .

6. Recommendations:

The researcher suggested a set of future recommendations for dealing with agricultural and green areas

1. Abolish all laws and legislation pertaining to agricultural and green areas and enact a clear, unified law jointly enacted by all relevant ministries and authorities to avoid discrepancies and conflicts of laws enacted during the past decades. Thus, there is no confusion in the interpretation of these multiple laws, in addition to the gaps are being exploited for agricultural and green areas.
2. Make agricultural areas within the city's heritage and included in the law of reserves
3. Scaling Baghdad city demographically and expanded geographically (spatially).
4. Development of Iraqi provinces and cities to pull the momentum of pressure on agricultural areas and green and open in the city of Baghdad
5. Any unintended or deliberate activity practiced by humans towards agricultural areas should be avoided such as bulldozing these areas in order to convert them to other uses such as housing or industry, for example
6. Protecting agricultural land, green, open and vacant, free of uses in order to establish a green shield to prevent urban and industrial encroachment and other uses that violate agricultural and green areas
7. Acquisition of open and abandoned areas if they belong to a non-state (government)
8. Providing legal and administrative facilities to the agricultural sector and reducing taxes and benefits on importing agricultural equipment and supplying the sector with modern technology that contributes to its development and imposing some restrictions on imported products competing with the local.
9. Supplying the agricultural sector with modern methods in watering and agricultural production and utilizing the land unit for its spatial value and then supplying it with efficient food industries
10. Maintaining agricultural and green areas on both sides of rivers and streams as an agricultural and recreational outlet for the city and its urban structure.
11. Reducing the pollution that hit the open areas and reducing the throwing of all kinds of waste
12. Rehabilitation of the neglected open areas and the removal of waste and excesses that hit the soil layers.
13. Removal of improvised housing areas and un-authorized building area, especially on agricultural and green areas in the city of Baghdad by providing appropriate alternatives in other cities.
14. Strictly enforce laws and legal and planning controls.
15. Improve the reality of other cities at all levels to reduce migrations to cities other than their cities.
16. Eliminate the disparities between rural and urban areas and provide services to the countryside to preserve its texture and function, which prevent the migration to the cities.

17. Preserve the social, urban, environmental and economic of the city and its identity, as well as it must be not allowed for population increases that exceed the city's ability to meet these requirements and standards.
18. Converting open areas into forests, agricultural areas or nature reserves.
19. Create buffer zones along the Tigris River. Each part is invested individually for the purpose of increasing green areas, orchards and hiking, and promoting sports and water entertainment, while preserving the river environment and its sustainability and protection from pollutants.

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