

Evaluation the reality of the open and green spaces residential unit according to the locality and proportionality of the area with the size of the population using GIS

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ABSTRACT

The research focuses on the importance of the open and green spaces according to the residential unit and its role in filling the void of the actual need of the population for this type of spaces because of the negligence of the green spaces and lack of the most basic requirements and overtaking them by random construction, we took the locality of 636 of Amiriyah, as a model for the study and during the field visits and getting maps and using the Arc map program we calculated the green areas and compared it with the approved standards, and the proportionality of the area with the size of the population as well as to identify the person share of those spaces and also studying the reality of the locality, and the size of the changes experienced by the homes because of the circumstances experienced by the country such as overrun the private gardens because of the housing deficit, generating a significant shortfall in those areas hence the importance of research came from by finding alternatives and solutions to the shortfall of those spaces that achieve the best results for the development of the locality as a model can be applied to all residential areas.

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1. Introduction

The open and green spaces are considered to be a basic need for humans and not less important than the rest of the spaces within the housing unit, as they have a psychological impact on the family, and environmental impact in mitigating and purifying the air and also esthetic and educational impact, when green spaces are part of our homes, this is a continuous entertainment and regenerate the psychological after hard day's work and also the garden has a role in the development of aesthetic taste in the family and at the same time they are a source of education for the children. The importance of the using an open space within the housing unit increase because of the small and narrow space and overtaking on the home garden area for construction must be the existence of alternatives, i.e. using of proper planning to exploit the open spaces to create a comfortable environment to meet the psychological, cultural, environmental and social needs of the family, and using the area in front of the building unit in enriching the aesthetic and gustatory side of the street and protect the environment from pollution.

2. The theoretical side of the research

Research Hypothesis: The interest in open spaces and greenery within the housing unit and coordination it, is reflected positively on the environmental aspect because of its impact in enrich the aesthetic side of the street and protect the environment from pollution and working to provide the appropriate atmosphere for the family to spend their times as well as the economic side, investment and activation and the educational side through aesthetic perception and development of the artistic sense of family members.

Research problem

The problematic research in the following topics: -

1- a lack of green space due to negligence and lack of law and overrun by random construction.

2-Not having gardens because of the residential increasing and lack of awareness of the possibility of using the roof and turn it into a beautiful garden.

3-neglected area in front of the house and in some cases overtaking on the sidewalk in front of the house and turn it into a garage and there is no law that force the owner of the house to plant sidewalk and coordination it within certain controls in order to enrich the aesthetic side of the street and residential environment.

Aim of the research

Compensate for the shortage of green spaces at the local by employing the neglected spaces within the housing unit to provide the appropriate atmosphere for the family to spend their times and enrich the aesthetic side of the street and residential environment.

To achieve the aim of the research we must know:

1. Identification of the importance of open areas and green at the local of the residential unit.

2-Definition of the study area (Amiriyah / locality 636), in terms of location, population, area, land use.

3. The reality of the open and green spaces in the study area dealt with according to the approved standard.

4. The reality of the situation in terms of increasing population and overrun upon the public and private open spaces.

5. Propose solutions to make up for the shortfall.

Next comes the conclusions and recommendations.

The limits of the study: the locality of 636 in the Amiriyah district boundaries.

3. Open and green spaces and their importance for the children and young people and the elderly

The open and green spaces beginning on the locality in 2500 m² and never away more than 400 m of housing, and be open to all groups without any limitations or fees (Mohammed and Ahmed, p 6.2011) and it plays a prominent role in upbringing of children and to guide the behavior of young people, which calls for creativity in the planning and design style that achieves the goal of research, through which it can achieve the following principles: (Salem, 2000).

- The educational side: the training of family members and make them aware of since childhood to interact and interest in agriculture and caring for plants and conservation and not harvested or destroyed.
- The aesthetic aspect: develop a sense of their aesthetic aspects, which is reflected on the psychological comfort and clarity of mind, psychologist (Howard Kia) says on the green color that the colors in the human have large impact, Scientists and researchers have conducted studies on the colors show through which the green color fills self-delight and pleasure and comfort of sight.
- The social aspect: working on changing lifestyle in the home and opening to the outside and the link with nature and provide a natural environment to improve and increase family bonding through a family meeting and spend beautiful times.
- The economic aspect: activating the role of investment in the garden helps to meet their family daily needs by growing some vegetables and fruits.
- The health aspect: the trees work as resistant to pollution and dust filtering unit from the air and reduce the toxins and pollutants that are inhaled, and the odor of trees and flowers have impact in giving psychological comfort. circling the house with trees works as a buffer to dust and reduce temperature within the housing (Bahammam, 1997).

4. Landscaping and Society

The landscaping has influential impact on humans there is such a German says " If you want to live a happy throughout your life you have to grow gardens and flowers. "This shows the importance of green spaces for humans and its relation to life. The urban agriculture and its erosion problem within urban areas as a solution to the problems arising from the decrease in farmland as a result of urban growth and which can be up to cultivate the entire roofs of buildings so that a large proportion of the city is planted area. the gardens growing on the roofs of buildings beside achieving aesthetic goals, there are psychological goals and functional as a protection for the building from the sudden changes of the climate, saving energy consumed within the building as well as the reduction of the proportion of air pollution, it aims to transfer the garden from the ground level to higher levels in an attempt to provide a natural environment suitable for the growth of human and contribute to its psych and its association with the land, which he separated from as a result of city dwellers, and with the population density there is a loss of green spaces. (Khater, p. 13)

5. Open and green spaces on the residential unit level.

Home garden: a special housing park and service the users only on an entertainment level, while the visual and environmental benefit to the region as a whole and does not have a limit (Mohammed and Ahmed, p 6.2011), the home park is the most important parks it targets the beauty of the building and the facade of the home and provide shade and heat protection from the sun and deodorants and purify the environment from dust and break the wind and dust storms

and provide places for the kids to play and the family's gathering (infection, p. 12, 2010).

According to a study carried out by Dr. Ali bin Salem Bahammam of the College of Architecture and Planning, King Saud University, said the working human spends inside the home between 12 to 16 hours per day and these hours increase for housewives, children and the elderly, sometimes up to 24 hours per day, and has spread over the past years the phenomenon allergic reactions, called the closed buildings diseases where the house must act as a barrier between external climate influences and the interior activities of the population, and that the design respond to each case of external environment and its requirements, populated comfort, as it should strengthen the environmental direction that accommodates nature and employs elements (of the sun and the winds and the land and water) for thermal comfort inside the houses in natural manner, and that the architects design of the houses benefit from a climate positively and avoid problems and harms. The survey points about modified air components and purified it from harmful compounds and dust, and repel dust storms and deodorants heat and noise insulation, noting that studies have shown that every one square kilometer from trees could give in a day (one to three tons of oxygen) and that a single tree can absorb smog from a vehicle with internal combustion engine going 25 thousand kilometers per year, it has proven to be able that one full of growth tree can repel and absorb 978 kg of dust annually deposited on the leaves, and its branches and trunk then go down to the ground when the rainfall, stressing that the availability of green spaces also contribute to reducing the temperature of the air in summer by 5 to 6 degrees Celsius, and raise the temperature in winter and also raise the relative humidity in the dry areas by 15 to 20 degrees. Recommends that all international institutions to increase reforestation in cities so that the Green Zone area in residential areas and around, about 40 per cent of the total area (Ali, 2001). Urban development plane for the development of green and open areas in Baghdad, a series of proposals for private gardens and adopted the following – private gardens represent a special model for the city of Baghdad and suggested a mechanism to support private gardens, improve and encourage citizens to its preservation and protection from contaminants, pest control and find a way to organize public sidewalks and alleys of the residential areas and provide a permanent maintenance.

(Al-Zubaidi, p. 73) For this to be achieved must educate family members, and point the role of the municipality through the development of communication networks i.e. can municipality customize the web site to provide services to citizens, so citizen can get to the main page when he gets the needs of a particular query, advertising through the network for the establishment of courses or seminars or announcement shows or sell seedlings, or the provision of a dedicated staff service can be sent to the family when needed through a network connection or communicate by e-mail or telephone to provide what serves the human development side.

Iraqi Planning Ministry also adopted a population factor to determine the green areas in the Iraqi cities where select (6.5 m²) per head of population and a study prepared by VPL Paul Service in 1973 has been proposed (5 m²) / person standard is supported in the green areas within the planning units (neighborhood + Locality) as playgrounds for children and parks in the light of various intensities, according to the distributed land to the design to increase these spaces to 11 m² / person in residential construction sites. the base plane for

the year 2000 included another way to calculate the green space for each person of the total population at the level of residential areas, the residential areas were divided into three regions first and second and third and gave each specific green space area per person per square meter as shown (table -1) and through the table, we find that the size of residential area in reverse relationship with the individual's share of the outside greenery. this is related to the lawn space for each residential house by an increase residential density increase per person share as shown in the table. (Nouri, p. 26)

Table 1. Green spaces indicators in residential areas.

Green space m ² / person	Widget residential area rate	Class residential area
6m ²	150 m ²	The first area
4m ²	300 m ²	A second zone
3m ²	600 m ²	Third area
5m ²		the average

Source: polservice 1973

6. The rooftop area

- the surface (roof) is neglected spaces and can be converted from a deserted place in the house roof to a garden where the family have fun, especially when diminishing spaces like backyard and some internal voids due to economic conditions, so the surface seems an alternative to the yard from the old home and garden at present, it has some characteristics that make it a beautiful place in the evening ,big height (about 10 meters) and being open at the sky and without walls and barriers restrain the sight, all this would make a family heading to a garden roof as an option better in addition to being a place to relief, and there are other aspects reinforce the importance of the roof garden, like environmental option, the idea of the development of green spaces and trees and umbrellas that will reduce the amount of the sunlight reaching the whole house space, and this is one of the types of good thermal insulation, and from a health standpoint, the cleaning of the surface of the waste and trash constitutes a healthy environment for families and children in particular, because it benefit the children to play safely and exposure for the sun and get the most amount of pure oxygen from the greenery, as well as to accustom them to see the beauty and to contribute with us in agriculture and helps develop styling temperament and the aesthetic perception al they have. (rooftop gardens beauty and a job – 2005) .

7. Cultivation surfaces(rooftop)

The cultivation of the surfaces is one of the technology that provides a wide range of benefits, they are helping in organization the building heat ,i.e. heat it during the winter and cool it during the summer as the green roofs reduce pollution as it works as a filter to purify the air. Among the benefits of green roofs, doing an important role in reducing the noise, which is one of the modern-day problems, especially in the cities. We should also not forget that green roofs have many economic benefits, they increase the life of the buildings as it works as thermal insulator block them from the sun heat also reduce air conditioning costs in the summer and heating during the winter.

8. The goals achieved by planting rooftops

First, the environmental and health goals:

- 1.Reduce the environmental pollution resulting from the increase in buildings and structures areas with little greenery cover in cities 0.2
2. cultivation of (1.5 m²) of green provide the individual with its needs of oxygen for an entire year 0.3

3. get rid of trash, which is stored on rooftops which cause the distortion of the aesthetic appearance of the building and increase the chance of fires.

4. purifying urban air from pollutants as proven that every one square meter of green has the ability to remove 100 grams of air pollutants each year.

5. Reduce the proportion of carbon dioxide found in urban air through the consumption in plants photosynthesis, which produce different fruits.

6. produce safe healthy food by controlling the fertilizer and the use of chemical pesticides.

7. exploit the rooftops instead of being a store of trash and old things that result in environmental and health damage.

Second: The social goals

1.anyone can produce the types of vegetables they needed, making the person more self-confidence, especially the retired elderly who used to have a role and an important acts in the community.

2.provid jobs for housewives and young graduates earning money and raise the income of Egyptian families.

3.provid large land to cultivated with vegetables and exploitation it in the cultivation of important such as wheat, rice and other economic crops.

4. by planting rooftops, encourage the social bonds between individuals in society by cooperation of residents of single building as well as the street in agriculture and in the exchange of crops produced leads to strengthen the population bonds with each other and to solve their problems easily.

9. The garden roof

The roof garden considered to be the from the Urban surface that directly connected to nature and have external activities exercised only outdoors - and housing – means, internal activities that you do not exercise in the open air and you need a kind of privacy in the same time. And economically: alternative on all open and green spaces that can no longer be made available either for economic reasons - such as the price of the land or the lack of space that can be exploited to provide landscaping. And socially it is the only outlet near the family that away from the concrete walls and indoor and also a family meeting place. (Khater, p. 46). Economic aspects have direct influence on rooftop garden design, and the level and quality of the items that they contain, as well as the spread of the green color is generally linked to the economic and social level of each region. The higher the economic level, which is often associated with high social level ensures that high-level urbanization and an increase in hygiene rates and increase in green areas. It can be considered that the high social and cultural level is accompanied by interesting elements of the environment residential beauty, as can be seen that the affect of the green element in the development of human behavior and thus works to raise the social and human level. So when you think about it in the upgrading of a specific region and development should give priority to create green and open spaces to keep the area clean on a continuous basis. It is noted, of course, that the suffering of the people be the largest in the housing projects for low-income people, in those urban areas there are more people in need of open spaces suitable for entertainment and closeness with nature, but do not have the physical ability to escape out of the city in a vacation to beaches or the remaining places of natural suburban and rural areas, or even for clubbing but vast open areas for planning demands high costs that the government is unable to provide on its own. it is

therefore clear that the government alone can no longer provide the necessary spaces to create urban spaces, green areas without the help of parents or the beneficiaries of this service. Therefore it is necessary to unite the government as responsible for providing those types of services as they are responsible for the provision of educational services, health and other and users of that service they are taxpayers , it is imperative that there be measures and legislation specific to ensure its implementation , and evolve their behavior and their sense of their importance when lost. For example, the development of homes and cultivated roof by parents, i.e. to be provided with the necessary elements of the plantations and awnings and other architectural and plant elements outlets through a government-backed, such as nurseries owned by neighborhoods so that the prices are affordable for all people of all levels and socio-economic as well as provide news , information, technical data capable of giving the architectural and planning ideas and appropriate solutions to the population. Thus, the people who have contributed for the establishment of the service rather than government and in return the government to provide elements for the development of rooftops as well as technical expertise capable of providing appropriate solutions. Therefore it is necessary to think of new low-cost elements to be used as a garden roof that accessible to all . On the other hand, it is bound to be there is a feature of the building, which have cultivated roof , for example, exempts from the tax a certain amount or to be a priority in the delivery of services and various facilities. It is necessary to know that it's not important for the elements of the garden roof to be with a high cost as much as is required to be coordinated and compatible with each other and perform the function required of them efficiently and successfully and thus it develop the human behavior and create way to entertain .

10. Green roofs experiences globally and regionally

Germany lead in the green roofs technology in the world. In the beginning of 1980 the government provided support for the first project in which carried out the green roofs, and now the total green roofs in Germany up to 86 million square meters, equivalent to 14% of the area in Germany , in London, they developed a plan aimed at 100,000 m² of green roofs as a minimum by the year 2012, at the Asian countries, the Government of Singapore developed a plan for implementation between 2009 to 2015, where the planned supports 50% of the installation of the roofs of buildings costs, and in China since 2003, it launched a campaign for the dissemination of green roofs has the total green roofs of 500,000 square feet, equivalent to 7% of the area of the city, and in the United States surfaces becoming green is part of the sustainability plan, the Ministry of planning and development grant to investors who provide the design for the building is available where vegetation by 50% of the total surface of the building.

In Beirut, due to buildings that turned into what looked like a forest of cement and thus shrunk the available spaces for the establishment of parks and it became impossible to agriculture on the sides of roads and pavements Currently, there are about 18,500 of the roofs of the building vacant and imposing planting one tree only on each building there will be 18500 tree which is equivalent to the number of trees in the Central Park in New York.

In Egypt , the idea of planting surfaces began in 1999 in collaboration with the Egyptian Ministry of Agriculture to help the citizens of low-income to grow some vegetables on

the roofs of their homes to meet part of their needs with the same time attracted a number of middle and upper class to turn their rooftops into gardens. (Khater, p. 69)

11. The practical side

Reading reality through analysis and viewing .

12. view of the study area (locality of 636)

The locality of 636 in the Amiriyah neighborhood located in the Karkh district on the western border of Baghdad, one of the areas that has seen changes in the residential side resulted from the recount and emigrating that occurred after 2003, with area of about (266 800) m² and a population (20,358) people with an average household size (6) and sizes plots between (600-400) square meters with the exception of the area April 7 that fall within the locality of 636, which was the distributed land where an area of 120 square meters, this land used in the study, the majority of land used in the residential area in the first place and then commercial use in second place, followed by educational and governmental use there has been many division of the house with a 600 area square meters to five or six role with an area of between 100 m² to 50 m² due to the difficult economic situation and the inability of the state to find solutions to the shortage of residential units so a lot of families chopping their house to a number of units either to be sold for profit or to marry off their children and to provide a separate accommodation for them and this division was on the private garden i.e. more residential units do not have a private garden and there is no public park to meet the family requirements and provide suitable compensation for the missing garden .



Figure 1. satellite image showing the location of the study area is the city of Baghdad.

WWW.USGS.com.source



Figure 2. Bring down the map and match them with the satellite image after a correction

Source: researcher

13. The green spaces in the locality of 636

To show the importance of the private garden through the original plan of the locality, we identified public green spaces on the grounds that the housing units has private gardens, depending on the data obtained from various sources and satellite image of the city of Baghdad when was shot down Amiriyah neighborhood map (the locality of 636) and match them to satellite image of the city of Baghdad, after we patch it through Arc Map program and (-shape 1) shows the study area within the city of Baghdad and using the techniques of GIS has been matching the map with satellite image as shown in (a-2) and through the tool Editor. there was painted phenomena and geographic boundaries of the locality, and determine land use (Figure 3). Through it Cut polygons tool there we identified green space sites, and calculating the area of the existing parks in the locality, and as shown (Figure 4).



Figure 3. The uses of the land in the locality of 636.

Source: researcher

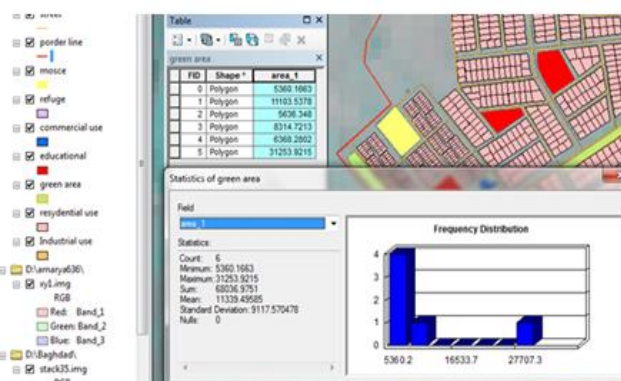
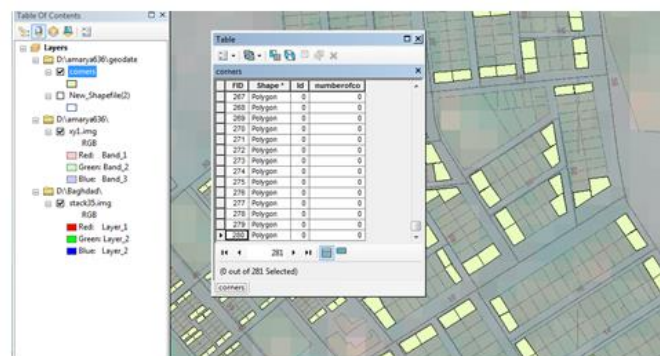


Figure 4. An area of green areas in the locality of 636

Source: researcher

For the purpose of comparing the approved standards we estimated the population for the base year 2016 based on the last census of 1997 and the rate of 1.26 growth and using the equation $P_1 = p_0 (1 + r) n$ and (Table-2) shows an area of green areas and the per person share of this area is much less of rates and standards that have been developed since its (5 m²) standard. We had seen through field visits there were these spaces neglected and lacked the most basic requirements of plants or seating areas or toys or lighting and other furniture supposed to be supplied to create a pleasant environment in

the locality from the other side that the housing units according to the general plan of the locality was the third degree with an area of 600 m² with private garden area ranging from (150-200 m²) but after the division of most of the residential blocks they were trespassing on private gardens, which led to deprive families of those spaces and became families lacked green spaces on the residential unit level and at the level of the locality, they do not find what meets their requirements. Through field visits and review, the specialists were not able to find information on the number of residential blocks that have been sorted and broken down due to the absence of regulations, laws and frequent abuses and through watching and recording information of tag offices that sell the homes, they had information that all residential blocks of the site corner has been cut up and sold, and the Arc map program was awarded a number of the same location corner pieces and the number was 280 Residential segment as shown in (Figure 5),



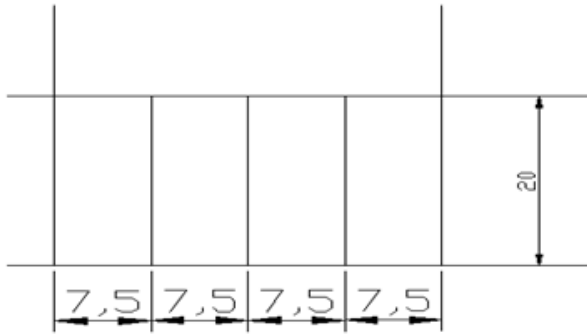
The form (No 5). same location corner Pieces.

Source: researcher

where the pieces divided into four residential units i.e. every corner is transformation of residential units with an area of 600 m² to four units with an area of 150 m² as shown (as - 6) and the output will be $280 \times 4 = 1120$ housing units, generating an increase in population density and building blocks, and a lack of private gardens area, because the piece that has become an area of 150 m² was of construction rate of 100% and some of the pieces have been divided into 100 m² or to 50 m² In this case the parents are forced to overtake the pavement and fence and turn it into a garage for the car and this has a negative side on social and psychological environment and contamination of optical problems at street level, the transformation of residential units from the cutting of large areas into small pieces not exceeding 50 m² sometimes have a negative effect on the psychological state of the family because of the small space constraints and the impact of health because of the lack of open spaces and the possibility of entry of the sun and the impact of environmental and esthetic because of the lack of the green space on the housing unit level and on the street level And to find solutions can educate parents exploit surfaces and turn them into gardens as an alternative to the garden space that has been converted to build on, so the family can provide a safe place to play for the kids, the elderly and young people to spend their leisure time and develop a love of agriculture.

Table.2. Per capita share of greenery.

Per capita public green spaces	Green space areas	Projected population for the year 2016	The population census in 1997
0.2992	68036	20358	12567



Forms 6. shows the model to sort the residential segment.

14. Conclusions

1. The total green area in the study area (68, 036), which is a small percentage compared to the number of the population, especially after the increase in population due to the emigrant people to the region.
2. The division of the residential area to number of pieces led to overtake upon the private gardens leading to the need for families to compensate them as an alternative outlet for private gardens.
3. Through field visits to the public gardens, we found they were neglected and lacks many of the requirements that meet the needs of the population of children and young people and the elderly.
4. Change in land use and the removal of large of private property located within overlooking the street and converted into shops leading to reduce the person share of the garden.
5. The lack of clear legislation to preserve green space and prevent overtaking them.
6. Remove large of private gardens because of divide the residential place to more than a piece led to a significant lack of green spaces and turn them into blocks of concrete.

15. Recommendations

1. can educate parents exploit surfaces and turn them into garden as an alternative to the garden space that has been converted to a building , it will be an outlet for them as well as it can bring them a profit through the cultivation of vegetable crops needed by the family daily use .
2. awareness the neighborhood youth to plant the pavement in front of the house with trees and climbing plants that achieve environmental aesthetic aspect and have a role in deodorants the air and lower the temperature and reduce dust.

3. It is noted during field visits to the region that the median areas were neglected because of the security situation of the country and that if it has been cultivated with plants , it will achieve aesthetic aspect and environmental role and can activate the youth and students of schools and social organizations and even mosques in organizing campaigns to donate cultivate, organize, thus fulfilling the educational role for the Human Development and the preparation of a society with a sense of responsibility towards his neighborhood.

4. make good efforts that aimed at increasing the green areas through the selection of appropriate plant species to withstand the harsh weather and suggest a way to develop the work and service system .

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