

## Analyzing of urban green spaces development process with emphasis on sustainable principles (Case study: Mashhad metropolitan)

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**Abstract:** Urban green spaces are an important element in structure of cities. From these spaces can be named as the urban breathing lungs that they have various functions such as: City beautification, environmental modulators and leisure. Public land uses in many cities especially urban green spaces aren't successful due to some factors such as: high population density, imbalance in land use location, neglect to radial access for providing services and etc. Today, it isn't enough that we increase service centers also effort to achieve the standard and urban per capita because it is possible that all citizen haven't appropriate access to land use (parks & urban green space) due to imbalance of their location. Due to urbanism phenomenon grow sharply, so analyzing of appropriate location and its geographical distribution is very useful in development and future of cities.

In this research has been studied urban green space development process. This study is applied and the research method is "descriptive – analytical". Also data collected is documents. The findings show, the process of green space growth is well but don't adapt with global standards. So, should be attempted in this issue.

**Key word:** Green space, urban management, land-use, Mashhad metropolitan

### I. INTRODUCTION

Green spaces are as a complement of urban physical structure. These spaces are a type of urban land-use that has ecologic and social traits. On the other hand, today planning and design is adaption green space networks (Ericson, 2004). Today, urban green spaces are introduced as appropriate method for promotion of life quality due to impressive social and ecological influences (Barker, 1968). So, an urban green space is important issue due to creating beautiful landscape, also it is as obstacle air pollution in cities.

Last years in Iran, don't achieve sustainable cities especially in Mashhad metropolitan due to development of cities with out regard to infrastructure such as green spaces. In different section of cities exist problems such as air pollution, terrific, shortage of green spaces. Appropriate planning & effective management in urban green section are necessary for eliminating these problems. Effective management is led to promotion of humane life quality in cities. Some countries in world are successful to decline shortage of green spaces by implementing different plans of developing green spaces.

#### Development of green spaces in Mashhad

Old Mashhad according to natural condition has numerous trees and pastures. Old Mashhad is introduced as green city at previous time. But, green spaces have changed in last centuries due to development of city. According to research, in Mashhad the ratio of green spaces to city area is high at Qajar<sup>1</sup> age. In 1922 decade (Pahlavi<sup>2</sup> age ) decrease this ratio due to physical development of city. After that, Mashhad had grown sharply in 1962 & 1972 decades due to immigration of rural that was led to destroying of gardens and green spaces and making apartments. This issue introduced green spaces as important topic in urban issues. On the other hand, by developing of Mashhad the garden and agriculture lands that has been located around the city,

were combined with its .the figure (1), shows these changes clearly. Last years have destroyed many of green spaces and have replaced buildings and other urban equipment.

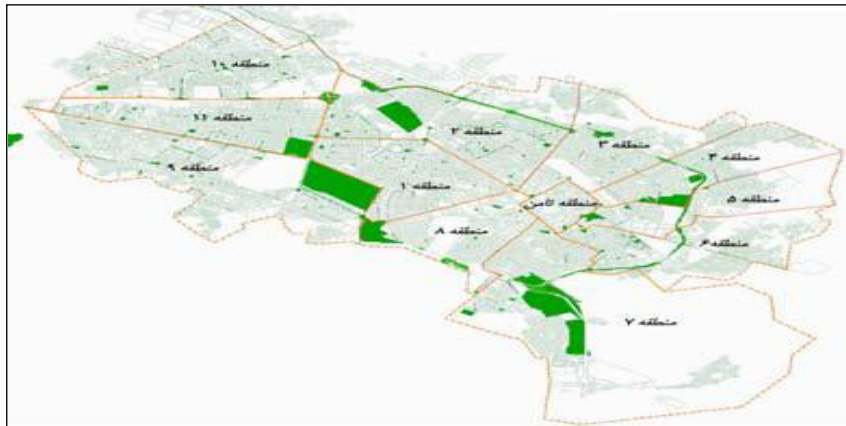


Figure (1): the plan of green spaces in Mashhad

In this stage decrease the area of green space land-use due to lack of appropriate plan. The results of plans and program in this stage show the lack of land has been led to increasing the value of lands so, has changed green space land-use to other land-uses. There are heterogeneous in distribution of green spaces due to high expenditure of making green spaces. Even, in some cities per capita of green space land-use is low from optimum range. The green spaces development process of Mashhad show that the first modern green space is national garden. It has been made in 1952. Then, in order to balancing between green spaces land-use and other land-uses (such as: residential, commercial, administrative and etc) were made parks in 1962 decade. The studies show urban green spaces increase to 11.1 km<sup>2</sup> in 1998 that the numbers of parks are 184 (*Vista & Pars consultant engineers*). In 2003, the numbers of parks increase to 672 and the area of parks is 12076761 hectare (*Mahmudian, 2006:134*).

After that urban green spaces development is important in 2006 & 2007 due to increasing air pollution. The area of green spaces in 2006 & 2007 are 6882 & 7244 hectare. In 2008, the area of urban green spaces increase to 7990 hectare that consist 130% of city area (*Zokae, 2008:230*).

Table (1): The indicators of urban green spaces (2006 – 2009)

2009	2008	2007	2006	Green spaces
80403	79903	72443	68822	The area of green spaces (1000 m <sup>2</sup> )
13.25	13	12.2	11.6	The ratio of area green spaces to city rea
11.6	11.2	10.8	10.25	Per capita of green space

The figure (2) shows, the process of urban green spaces development increase between "2006 to 2009".

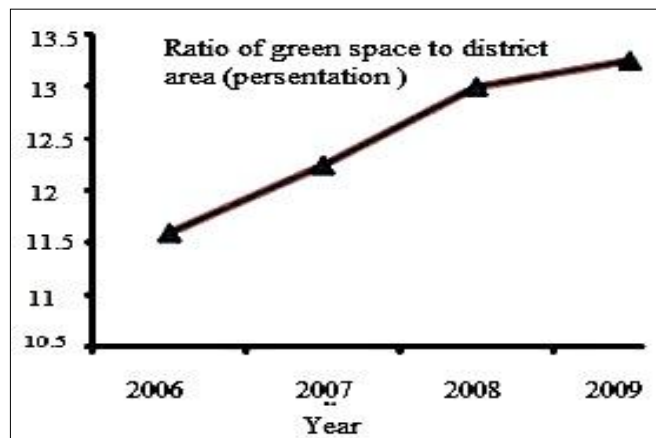


Figure (2): ratio of green space to district area (presentation)

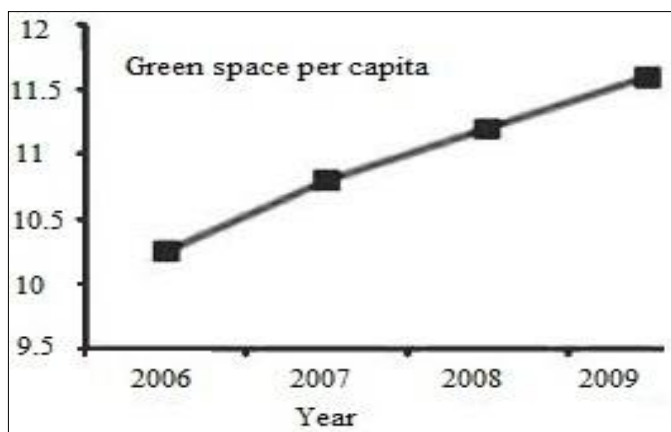


Figure (3) : green space per capita

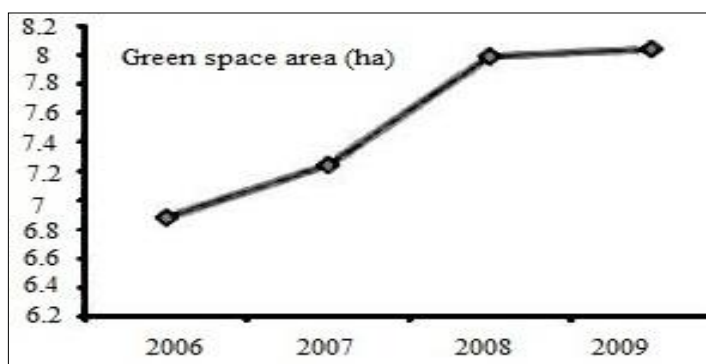


Figure (4): green

space area (ha)

**Current condition of Mashhad green spaces**

The green spaces management of Mashhad has been from 1972. area of urban green spaces is nearly 142375 hectare. Also, the averages of per capita green spaces in 12 of Mashhad districts are 12.01 m<sup>2</sup>. On the other hands, the most per capita is in district 12 (17.97m<sup>2</sup>) and the least per capita is district 10 (1.97 m<sup>2</sup>). So, the distribution of green spaces in Mashhad is heterogeneous.

According to report of parks organization, for balancing of green space in city, was suggested that was made parks, green roof, vertical green spaces and etc.

Regional and neighborhood parks are appropriate place for citizen as entertainment places. According to the World Health Organization, park spaces can provide physical and social health of people in city. On the other hands, these spaces strengthen urban landscape. So in last decades have been made in city due to important role. Figure 6 show sharp growth of urban green spaces in last years.

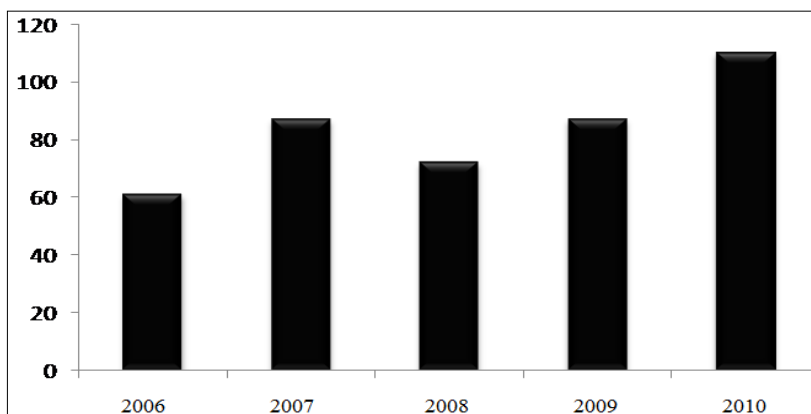


Figure (5): information of parks in Mashhad (2006-2010) Source: parks & green space organization of Mashhad, 2010

Table (2): parks information of Mashhad Source: parks & green space organization, 2010

Parks of Mashhad		
(ha) Total Area	Number	Area
1042	1499	<5hectare
168	28	5-7 hectare
929	44	>7hectare
<b>2140</b>	<b>1571</b>	<b>Total</b>

Table (3): information of Mashhad parks Source: parks & urban green space of Mashhad, 2010

Park area (hectare)	number	district	Park area (hectare)	number	district
67.5	47	12	9.90	88	1
47.3	60	13	124	140	2
79.6	51	14	111	83	3
339	95	15	156.1	174	4
143.2	46	16	156.5	160	5
39.6	60	17	81.7	46	6
150.7	74	18	21.8	43	7
180.4	54	19	30.7	73	8
120.9	122	20	19.3	20	9
77.2	31	21	19.3	31	10
32.3	45	22	49.6	27	11
<b>2138.4</b>			<b>1571</b>		<b>Total</b>

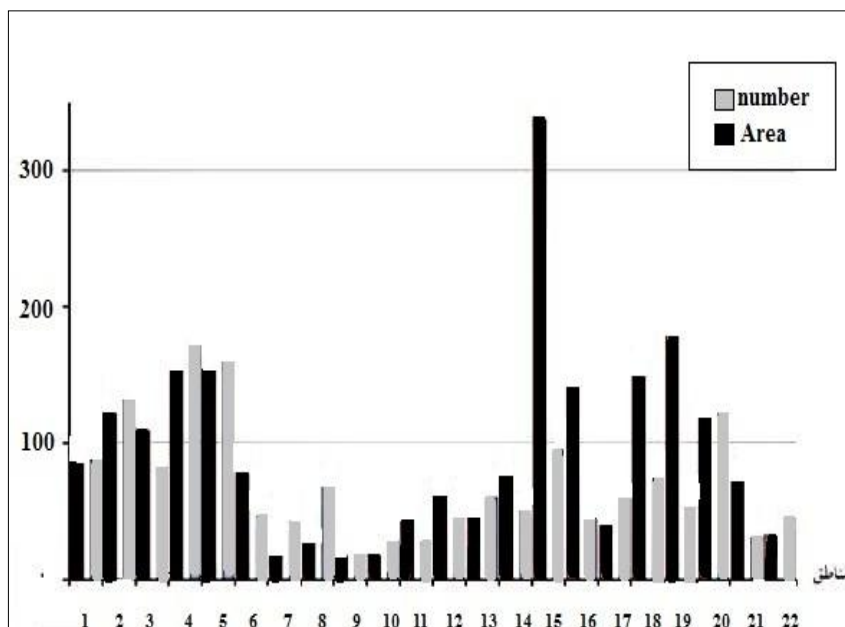


Figure (6): Number & parks area in Mashhad

**Developing of Mashhad and necessity of urban green space**

The studying of physical-spatial changes show, Mashhad growth sharply. The population in 1967 is 1.53 million and it increase to 6.4 million in 1987. In 2002 the population increase to 1.8 million and then in

2008 the population of Mashhad was 2.9 million. On the other hand, the area of Mashhad was 500 km<sup>2</sup> in 1972. But in 2008, the area of Mashhad was 730 km<sup>2</sup> (Iran census center 1967- 2008).

While developing of Mashhad, the land-use was distributed heterogeneous. Creating public and social spaces are important urban issues. Due to high centralization of population in Mashhad, developing of green spaces is necessary. Building of green spaces is the basic issue for achieving sustainable city. Also green space is important due to ecologic effect and emotion of human life (laqaee, 1995:6). So, both quality and quantity of green spaces of Mashhad is important. Indeed, parks & green spaces organization hasn't succeeded yet. On the other hand, Mashhad has been located in imbalance slope, so natural conditions affect to green space management (Parivar, 2008: 49).

Figure 7 shows, total area of indoor and outdoor green spaces is 19.7 hectare. By comparing of area green spaces and other land-uses can understand that the amount of green spaces is low.

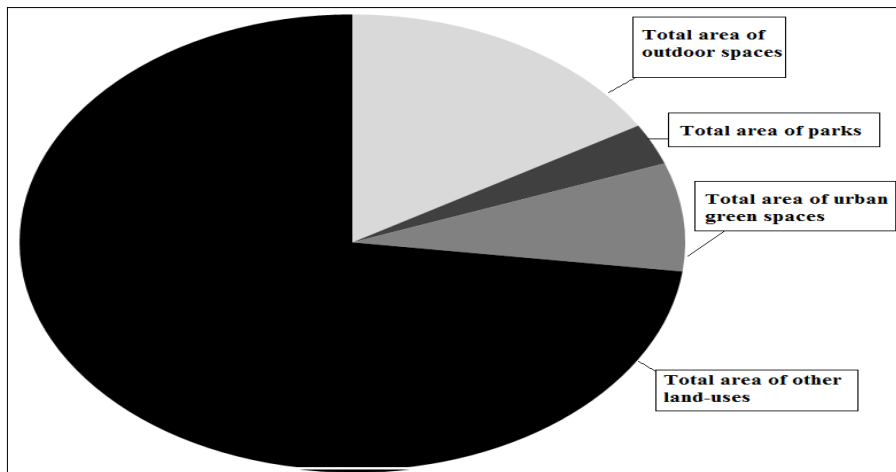


Figure (7): comparison area of land-uses Source: parks & green space organization, 2010

Now, per capita of urban green spaces is 12.6 m<sup>2</sup> in Mashhad. Mashhad located in dry region and preparing water is difficult. So, Mashhad faces natural elimination. On the other hands, the total area of urban green spaces is 2.28%. According to Presented standards by the UN and other international officials, per capita of green spaces is low with comparison other countries (figure 10).

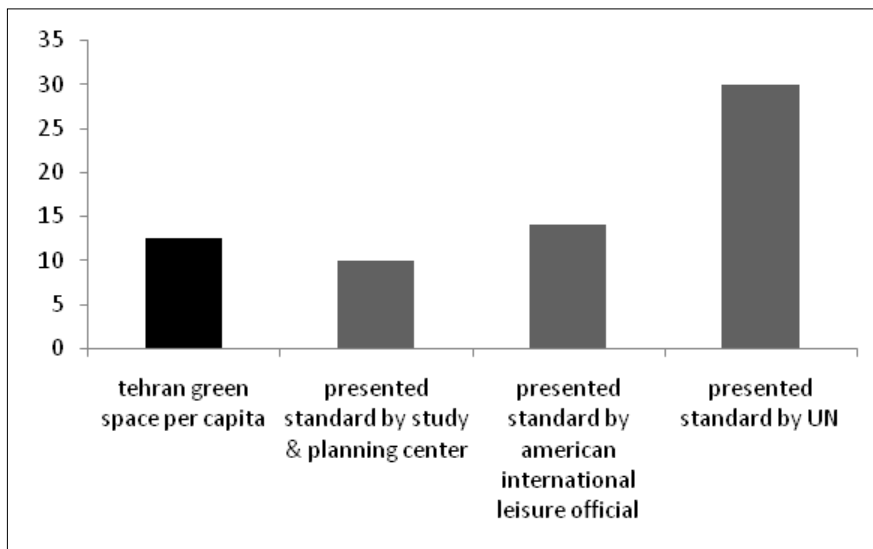


Figure (8): comparison Mashhad per-capita with other presented per-capita

**The organizations structure of green spaces management in Mashhad metropolitan**

The administration of city has been distributed between organizations. But there isn't cooperation between organizations. So, the organizations need to cooperate each other. However, there are some organizations for administrating of city, but also the main organization is parks & green spaces organization.

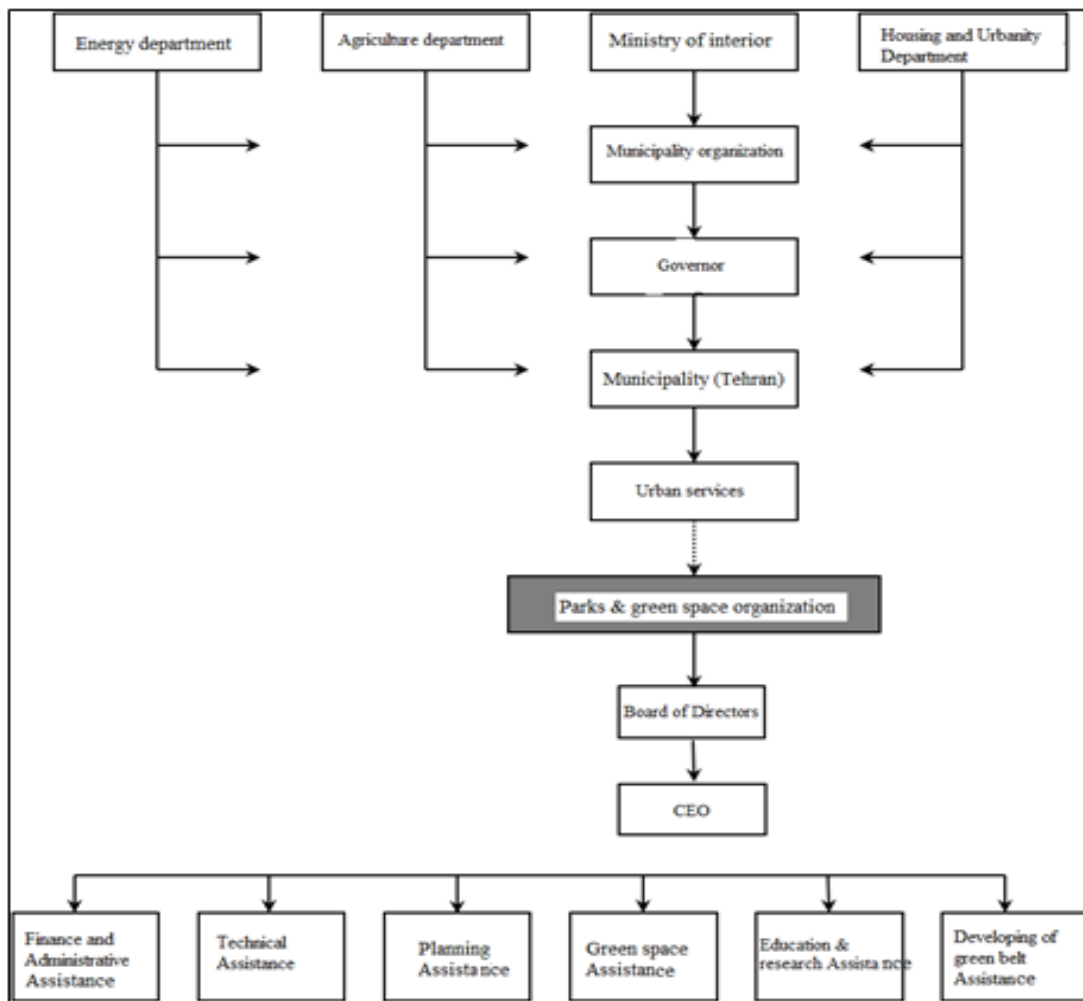


Figure (9): the structure of organizations

For promoting of green space management, gardens official was established in 1961. After that, change to parks and green space organization in 1964. Also, the basic changes were created in structure. The traditional methods were removed and were replaced modern technique for administrating city. The basic proposes of this organization are :

- creating appropriate places for spending leisure times
- preparing desirable places for promoting people health and comfort
- creating happy space for resident
- creating beautiful urban landscape and decreasing air pollution
- presentation microclimate that is led to reducing sound pollution
- controlling and protecting parks and green spaces The necessary policy of parks & green spaces organization are: updating equipment and methods of promoting urban green spaces
- developing resident partnership in urban green space introducing economical, social, cultural and environmental values of urban green spaces
- utilization of functional and biological elements for improving urban green spaces.

## II. RESULT

Preservation of green space and implementation urban plans in Mashhad show, process of green spaces development is appropriate. Indeed, developing of urban green spaces is the best solution for achieving sustainable city. Implementing of urban green spaces development plans have important role in urban life especially in Mashhad city. In these city urban management both should create urban green spaces and should protect green spaces. Appropriate and systematic plans are necessary for developing of cities. On the other hands , studying of urban plans show , green spaces are the best solution for decreasing air pollution , mental diseases and social problems in metropolitan cities (such as Mashhad ) . So has been emphasized to promoting of green spaces. thus , parks & green space organization have done basic programs in order to developing urban

green spaces ( such as : preparing water , using of native plants , utilization of modern techniques and etc ) These plans are led to creating new green space center in neighborhoods . Also, using of right and efficient management by adaption to current conditions is other important method.

Studied plans show a lot of points, they are:

- The important issue is unification between organizations. Increasing of citizen partnership via increasing public information about behavior between human and environment Utilization of professional xperts in research centers for improving urban life.
- Preparing comprehensive plan of green spaces.
- Revival structure of organization and creating new rules for promoting of urban green spaces.
- Correction of old laws that had been approved in previous time.
- Preparing financial sources for using modern equipments and technique.
- Making standard in urban management.
- Codification urban forest plan.
- Presenting of different models and other urban green spaces plans.
- Creating urban green spaces should be adapted to unique system.
- Strengthening of natural scopes that have been located in Mashhad.
- Prevention of mountainous open space by using native plants
- Changing industrial land-uses to green space land-use.
- Rivers is the most important natural element. so must be prevented from destroying them .

### III. NOTE

- 1- Qagar age is the historical period in Iran that was started in 1786 - 1847.
- 2- Pahlavi age is the historical period in Iran that was started after Qagar age .

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