



An Interaction between Sustainable Urban Development and Evaluation of Urban Environment, an Approach for Endogenous Development

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Received: 01.02.2015; Accepted: 06.06.2015

Abstract. Now, more than ever, the importance of city and urbanism from the viewpoint of environmental safety has been regarded as one of the necessities of sustainable development. Cities are growing constantly and every day their residents are increasing; such an increase, environmental degradation, the disappearance of natural resources, increase of different environmental pollution, creating fields, roads, streets, neighborhoods, educational and commercial centers present numerous problems for citizens. Following the increase in population and urbanization, cities have been become the center of biological accumulation, and broad and diverse economic and social activities. Due to the establishment of industrial, production and business organizations in the city and suburbs, land use of farmlands and natural greenspace is gradually changing, and urbanites will be dealing with environmental pollution and the lack of public greenspace. Progressively, people will be aware of the meaning, concept and true value of greenspace, indeed, it is synonymous with life, living, breathing, cleanliness and environmental hygiene, beauty, and freshness, and it calms spirit, cleans air, and decontaminates. Due to the rapid development of technology and industry, uncontrolled migration, and rapid and uncontrolled growth of cities and suburbanization, greenspaces in and around towns are being destroyed terribly. This article titled an interaction between sustainable urban development and evaluation of urban environment, is an approach for the endogenous development of Marand City and it says by considering urban greenspace, or more precisely by considering some levels of urban land uses with manmade vegetation, oxygen production, adjusting temperature, absorbing some of the pollutants, stabilizing slopes, increasing moisture content, and ultimately ecological efficiency we could improve the quality of urban environment and provide an attractive and proper space for social interactions and recreations of the society. In this paper, greenspace and parks are considered one of the main urban land uses in order to analyze the current status of greenspace, conform it to standards, offer suggestions for improving its quality and quantity level, and eliminate their shortcomings with respect to our abilities.

Keywords: environment, greenspace, sustainable development, standards

1. INTRODUCTION

The rapid growth of urbanization, industry governance based on new technology, and tendency towards industrial lifestyle along with the damage and destruction of natural resources and vegetation, conversion of farmlands and gardens to building structures, with an increase in population growth and environmental pollution have caused an imbalance in the ecology and vital capacity. Moreover, due to increased revenues, improved transport, increased car ownership, increased education, more leisure time, etc. parks, recreational areas, promenades, and greenspaces have become more important. (Field Brian and Brian McGregor, 1997, 226) Marand Garden City used to have abundant gardens and green spaces over the years, but today irregular migration and population growth are destroying them. On the other hand, this city is growing and developing. Therefore, we must pay attention to all the environmental characteristics of this city and it is necessary to design, locate and install appropriate urban elements in there. With this interpretation, in the last decades, floridity left this city and now every day we are witnessing the loss of its gardens, to the extent that we are now close to the

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end of the detailed plan that was approved for the city; per capita green space per citizen nearly reached 2/2 square meters in 2007. (Parks and Greenspace Organization of Marand Municipality) The importance of the mentioned problem will be more dominant when vehicles that produce smoke and noise pollution, and bother people during their leisure time increase in the city. By comparing the above figure with international standards of greenspace and the figure that the Ministry of Housing and Urban Development proposed for greenspace (7-12 square meters), this shortage will be reflected strongly in Marand City.

In this paper, regarding the mentioned importance, we tried to study the role and importance of urban greenspace and parks in the balance and improvement of environmental, psychological and social, therapeutic and cultural quality of cities, and the current status of the spaces of Marand City as one of the garden cities in the country, meanwhile, we tried to analyze the current situation and conform it to standards in order to offer some recommendations for improving its qualitative and quantitative level, because in recent years, Marand City as a garden city came under attack and undoubtedly lack of attention to it will lead to irreversible problems.

2. RESEARCH PURPOSES

1. Studying per capita and standards of Marand's greenspace and comparing it with international and national standards;
2. Studying the necessity of too conventional urban greenspaces and parks;
3. Offering scientific-practical suggestions and strategies for improving and developing Marand's greenspace.

3. RESEARCH HYPOTHESES

1. The extent and level of greenspace of Marand City are not conform to the standards and could not meet the citizens' needs.
2. Urban greenspace plays a determining role in improving the environmental quality of the city.
3. The proper distribution of parks in Marand City in proportion to its residents has reduced environmental problems and it will boost quality of life.
4. Ignoring technical principles and standards in the design of space will lead to confusion, loss of identity and chaos in the image of the city's streets.

4. METHODOLOGY

In this paper, in regard to different topics, two methods, documents and field studies were used; their techniques and tools are different. In documentary or library studies the following methods were used: taking notes – related statistics and information in the archive of offices, organizations (parks and greenspace in Marand City), and internet sites. In field studies, based on the nature of the subject, direct and objective observation, measurement, interviews, etc. were used.

5. LOCATION OF MARAND CITY

Marand County latitude 38 degrees 18 minutes to 38 degrees 52 minutes north and between 46 degrees 20 minutes to 45 degrees 12 minutes east of the Greenwich meridian. This city is located 1540 meters above the average height of the sea level. Its area is 3285/624 kilometers (approximately 0.7 of the province's area), it is located in the north-west of East Azerbaijan Province and due to its special geographical position i.e. Iran's ground connection with Turkey, Azerbaijan and Armenia, this city has a great importance. This county is limited to Jolfa County from north, to Arasbaran from east, to West Azerbaijan (Khoy-Maku) from west, and to

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Shabestar County from south. Marand City is the capital of this county and it is located at a distance of about 70 km from the center. In new division of the country, this county has 2 sectors (Markazi and Yamchi), 5 cities (Marand, Yamchi, Kashksaray, Zonuz and Bonab e Marand), 9 districts and 114 inhabited villages.

Table 1. Number of cities, sectors, districts, and inhabited villages of Marand County.

Number of inhabited villages	Number of districts	Number of cities	Name of location
114	9	5	Marand City
84	7	4	Markazi Sector
33	2	1	Yamchi Sector

Source: Plan and Budget Organization of the province, 2006

According to preliminary results released by Iran's statistics in General Census of Population and Housing in May, 2006, its population is 232067 people and population density is approximately 70.

Marand County in terms of economic has agriculture, livestock, and industry. Moreover, transportation, commerce, carpet weaving, and other business services are happening there. Due to the strategic position of large factories such as Takdaneh, Tabriz floor and concentrate, recently a CRT large factory is being constructed in Payam Village. Some of its historic buildings are Marand's Sansaroud Castle, Marand's Tape-e Khakestari Castle, Jameh Mosque, Bazar Mosque, Marand's Payam Caravansary, etc. Marand City has three types of climates: 1. Cold semi-arid, 2. Cold semi-humid, and 3. Upper elevations and its height from sea level is 1534 meters.



Figure 1. Marand County location.

Source: Marand's detailed plan, 2006

The role of greenspace in Marand's master and detailed plan

Urban master plan is about planning and determining methods for city development and meeting its needs based on predictions and goals of urban development. The master plan can be considered reasonable to select the right patterns of urban land use. Methods and urban planning include study of status quo, analysis and conclusion of status quo, setting goals and priorities, provisions, and presenting and implementing urban development plans and programs. Detailed plan, followed by the urban master plan is about executing programs approved for this plan. In

fact, detailed plan adjusts and designs detailed programs of urban and local areas. Marand’s master plan was assigned to consulting engineers by the Ministry of Housing and Urban Development planning during a contract on March 17, 1975. Its studies started on July 1975 and ended on February 1977, and it was approved by Iran Supreme Council for Planning and Architecture during a session on April 24, 1981. Marand’s detailed plan contract was signed with Zista Architectural Consulting Engineers on December 26, 1987 and at the same date, data collection and sending questionnaires to local departments and offices started, from late April studies on the mentioned plan based on local perceptions started. Due to the time between designing the plan and starting studies on detailed plan, Iran’s Revolution, formation of urban organization, and attracting villagers to the cities, the face of the city changed substantially; so Marand’s master plan was approved one more time in 1996 and its detailed plan is being approved.

Table 2. Marand’s land use in the years 1976-2006.

The proposed per capita (in square meters)	Area of land use in 2006 (planning horizon) in hectares	Per capita in 1993 (in square meters)	Area of land use in 1993 (in hectares)	Per capita in 1976 (in square meters)	Area of land use in 1976 (in hectares)	Land use
26/64	402/96	29	270/98	33/60	106/90	Residential
1/80	27/22	1/40	13/10	3/25	7/15	Business
4/2	63/53	1/38	12/97	1/55	4/94	Education
1/38	20/87	0/16	1/48	0/17	0/85	Medical and health
1/38	20/87	0/23	2/16	0/22	1/71	Sports
4	60/50	0/63	5/83	0/59	1/89	Greenspace
1/75	26/47	1/47	13/75	0/46	1/46	Security office
0/23	3/47	0/39	3/66			Religious
0/75	11/34	%6	0/52	0/21	1/05	Cultural
2/6	39/32	0/12	1/12	%9	0/29	Urban facilities and equipment
0/2	3/02	%1	%98	%2	%9	Tourism and hospitality
2/7	40/84	0/56	5/23	0/49	1/56	Industrial and warehouse
28/8	435/64	30	280/26	17/97	57/10	Streets and crime
76/43	1156/11	65/41	614/88	58/62	184/99	Total

Source: Marand’s master plan, 2006

It is stated in greenspace land use that although a large part of the city’s legal limit includes gardens, Marand City in terms of public greenspace has a massive deficit. Average per capita green space in Iran’s cities is about 3 square meters, however, this per capita is almost 1 square meter in Marand City. Many of the parks and greenspaces that were proposed in the previous master plan have not been created yet and available public greenspaces are limited to some small parks and areas.

Marand’s greenspace in the years 1956-1996

Throughout history, Marand City has been known as one of the garden cities of the country, so there were vast gardens among Marand City and surrounding villages in 1956, the dominance and superiority of this land use than other land uses were observable. The geographical scope of Marand City and greenspace are shown in map 5-1. Marand City population was 13821 people

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in 1956, its geographical scope was smaller, gardens were covered most of the area, also there were gardens and greenspace within urban areas and along the railway lines on the both sides of the city.



Figure 2. Geographical scope of Marand City and greenspaces.

In the years 1956-1996, Marand's population reached from 13821 to 95781 people, due to this high population growth rate, increased rural to urban migration because of various reasons, including urban land policy, etc. its gardens were destroyed and greenspace land use was changed to residential land use and unauthorized constructions happened.

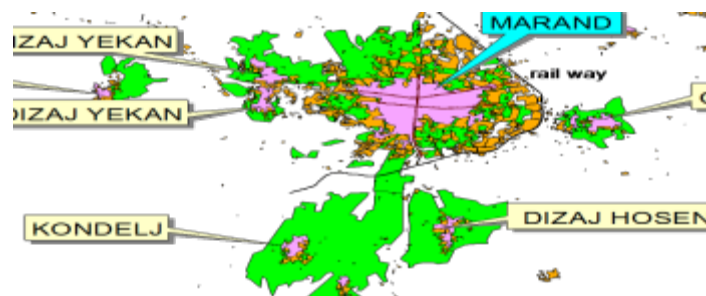


Figure 3. The range of geographical space of Marand was extended and its surrounding gardens were destroyed.

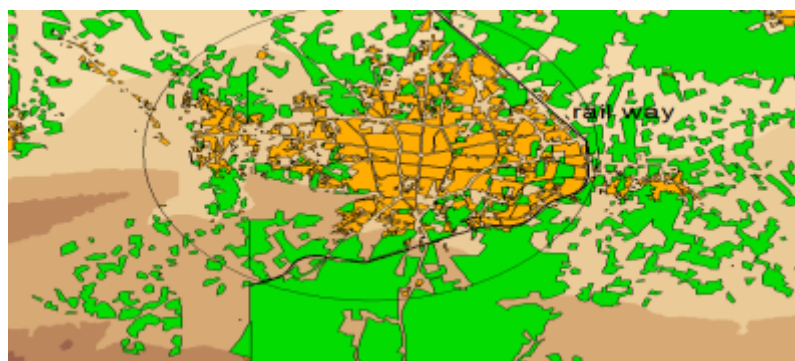


Figure 4. Physical development of Marand City.
Source: Marand's detailed plan, 2006

Marand's per capita greenspace in the current situation

Unfortunately, due to some negligence and weaknesses such as national policy, poor urban planning and management, inefficiency of urban planning (master plan) and management, greenspace has left this city and it is now lower than international, national and even regional standards. Although according to available statistics Marand's per capita greenspace has now developed compared to 1993, it requires better planning, investment, management and organization to reach national standards. Currently, Marand's per capital greenspace is 2.2 square meters per person.

Table 3. Marand's greenspace distribution in different places.

Area in square meters	Desired number	Distribution of greenspace
91678	7 cases	Park (except for children's parks)
18565	11 cases	Fields, deltas and related places
37999	20 cases	Boulevards in the middle of street
67605	35 cases	Sidewalk
42000		Razawan Garden and greenhouses
1700		Gardens and greenspaces in the neighborhood
28780		Greenspaces in public and private places
250527		Total

Source: Organization and greenspace of Marand County's municipality, 2011

Hypotheses testing and proving

Hypothesis 1: The extent and level of greenspace of Marand City are not conform to the standards and could not meet the citizens' needs. According to the statistics and data, the validity of this hypothesis is generally accepted; not only Marand's per capita greenspace is lower than international standards (15 to 50 square meters), the per capita offered by Iran's Ministry of Housing and Urban Development (7 to 12 square meters), and per capita of climate groups (5.5 square meters), but also it has not been able to reach the proposed master and detailed plan levels; some of the causes of this issue will be mentioned in the research conclusion part.

Hypothesis 2: Urban greenspace plays a determining role in improving the environmental quality of the city.

With regard to the various functions of greenspaces, the accuracy of this hypothesis is generally accepted. One of the performances of greenspaces is their environmental performance. Urban greenspaces as a city's lungs could perform air treatment process properly, reduce noise pollution, etc. by dusting and air filtration, and bring fresh air.

Hypothesis 3: Ignoring technical principles and standards in the design of space will lead to confusion, loss of identity and chaos in the image of the city's streets.

Generally, not only criteria and standards as urban furniture elements are considered the city's identity, but also they bring diversity to landscape and enhance the efficiency of the elements. Since space design and urban furniture are interdependent, the use of standards leads to citizens' comfort, coziness and well-being and it creates a good image in cities (streets, roads, and

squares). However, the validity of this hypothesis is accepted. Sidewalks and boards as urban elements are obvious examples of this hypothesis in Marand City.

6. CONCLUSION

Due to population growth and increased pollution in the urban environment, greenspaces' vital role is becoming clearer. Greenspace as a natural filter reduces environmental pollution such as smoke and noise, guarantees individual and social health of urban residents, and calms their environment. (Pourmohammadi, 2003, 38)

Greenspace in urban planning literature is one of the most important land uses, and also it is one of the main facilities of physical part. No matter how much greenspace is spread out in cities, it will not be enough. However, there are standards in this field, international standards of urban greenspace per capita is 15-50 square meters, according to Iran Ministry of Housing and Urban Development, it is 9 square meters per person, meanwhile, given the statistics, Marand's per capita greenspace is now 2.2 square meters. Before mentioning the causes of this low per capita and these shortages of green space in Marand, it might be noted that in recent years, very useful actions and measures regarding greenspace development have been done. The efforts in this area show increased attention to the importance of greenspaces in cities. Such efforts are laudable, although they have failings, we should not ignore them.

Therefore, conservation and development of greenspace are two of the important tasks of municipalities. However, Marand's greenspace is now suffering from the lack of conservation and development planning. The lack of greenspace development plan is one of the main causes of the destruction of urban greenspaces in our country, a city's greenspace will be defined in the framework of this planning and the municipality is obliged to move on based on it. It is obvious that such a plan requires a deep and specific study on each area. Now, the only planning in the field of greenspace is some spots on maps of urban development plans that are known as ranges of greenspace, most of these areas cannot be easily acquired, or they are not applicable. However, some problems regarding park and greenspace planners and developers are as follows:

- Financial difficulties in the development of greenspaces and parks.
- There is a false impression about the need for greenspace. (Lack of monitor and control over public parks and greenspaces has changed the land use of these places into commercial land uses.)
- Shortage of personnel, especially expert staff in urban management and urban greenspace.
- The lack of a coherent structure for the construction and maintenance of greenspaces.
- Construction of multiple land uses with different functions and large dimensions within parks and greenspaces, regardless of the level of service (in the urban hierarchy)

7. RECOMMENDATIONS

- Comprehensive planning of greenspace in Marand City. In this planning, each part of urban greenspace must have its own specific definition and planning, after determining the goal, the planning should determine rules and standards precisely.
- Maintaining and preserving the presence of greenspace. (It is equal to maintenance and preserve of life)
- Considering a research in the area of greenspace, so, the design of greenspace in each city should be carried out based on an applied research not imitation.

- Emphasis on the use of trees and shrubs rather than grass. (Development and save of green volume instead of green surfaces)
- Encouraging people and brining their attention to maintain plants using certain and low-cost species
- Municipality should employ specific plans and mechanisms to attract people to participate
- Considering sufficient funding sources for the purchase of land (development of greenspace) and the required equipment
- Providing an appropriate context for achieving the objectives specified on greenspace in urban development plans (master and detailed)
- Respecting the hierarchy of urban spaces for the development of urban greenspaces and parks
- Providing appropriate and periodic trainings in order to maintain and preserve plants enhance the culture of the people to the landscape
- The need for structural reforms in the country's environment
- Maintenance of urban greenspace in the vicinity of residential homes and the annual donation of flowers and trees to citizens at no charge
- Planting trees and shrubs in the streets, sidewalks and planning sites in streets
- Establishing appropriate facilities in the parks of the city and emphasizing security and access to parks

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