

Urban Greenways, Functional Integration; Case Study: Kan River, Tehran, IranSepideh Payami Azad¹, Hassanali Laghai²

1. Corresponding Author, Department of Urban Planning and Design, Kish International Campus, University of Tehran, Iran
2. Associate Professor, Faculty of Urban Planning, College of Fine Arts, University of Tehran, Tehran, Iran. Supervisor of the Corresponding Author Theses, from which this article has been achieved.
sepideh.payami@ut.ac.ir

Abstract: Almost since the beginning of urban planning, planners have sought means of incorporating nature into the city and preserving the surrounding landscape. The motivation for this has included aesthetics, health, recreation and amenity. Urban green corridor systems are readily accepted worldwide as a desirable recreational, wildlife and landscape resource and can bring many benefits to urban dwellers. The planning, design, use and management processes are critical factors in determining successes in meeting quality of life indicators. Today, increased urbanization and separation of city from nature has had severe impact on environmental issues of cities. Urban landscapes are changing from intact and valuable ecologic areas to fractured and ineffective areas, so that the nature image is increasingly paled. These issues affect three parts of urban sustainability including environmental, economic and social ones, the changes which require conscious management. Recently, the concept of sustainable urban management has been an important scientific topic. Targeting city development towards a sustainable development is an important issue that must be considered in the sustainable management of cities, one of the conditions for sustainable development of cities in linking urban life with nature. Providing ideas which make this link stronger and propel the city into the dynamic condition seems to be necessary. Environmentally friendly techniques such as designing green corridors conform the best to sustainable urban development. Green corridors make a dynamic relation between the cold urban bodies with natural bodies, and are of particular importance not only as an aesthetic element, but as a vital element in the condition of critical air pollution in enhancing environmental quality and the creation of responsive environments, and include concepts such as readability, a sense of identity and belonging. In this regard, using a descriptive and analytical method based on library data, and case study, this article studies the importance and the function of green corridors and pointing to Kan River valley, Tehran, Iran, assesses and evaluates the potential of this corridor and its multi-functionality. Finally, it ends with the introduction of a new type of urban green corridors that is multi-functional greenways.

[Payami Azad S, Laghai H. **Urban Greenways, Functional Integration; Case Study: Kan River, Tehran, Iran.** *J Am Sci* 2013;9(6s):131-137]. (ISSN: 1545-1003). <http://www.jofamericanscience.org>. 20

Keywords: Urban Greenway, Functional Integration, Kan River, Sustainable Development

1. Introduction

As cities grew rapidly in the late 19th century there was increased emphasis on integrating nature into the city landscape. Many early landscape architects, most notably Fredrick Law Olmsted (1822-1903), sought not only to improve the appearance of the city but to improve health and provide areas for rest and recreation for the crowded urban population (Hough, 2004).

In cities and towns, the surrounding environment is predominantly urban development. Habitat patches and corridors are frequently the remnants of the previous rural landscapes or new habitats that have been created or evolved within the urban matrix. Also preservation, expansion, and protection of our open spaces are of the utmost importance in maintaining the quality of life for city residents. Common types of urban green spaces include;

- Doorstep and communal green space (including balconies and courtyards)

- Private gardens
- Institutional land
- Local parks
- District and regional parks
- River corridors and floodplains
- Coastal zones

The Green Corridor activities provide solutions transferable to social, environmental, quality of life, and economic problems throughout the world.

Cities have been rediscovering their waterfronts for several decades, using reinvestment to proclaim their heritage and to redefine their civic identity. These changes can be traced to changing urban geography, as new modes of transportation, deindustrialization, and new economies of scale have led formerly important industries to move away from the urban core (Burga, 2008).

In other side, having an attractive riverside environment brings numerous social, economic and environmental benefits to a town including:

- adding to the visual attractions of the town and complementing other initiatives to regenerate urban areas and the economy;
- providing valuable wildlife habitats;
- offering educational and play opportunities for all;
- providing pedestrian and cycle routes through the town which are not just for recreational purposes but make a crucial contribution to day to day travel and transportation needs;
- improving quality of life and enabling more sustainable lifestyles;
- giving the areas a positive image and identity; and
- providing a tranquil atmosphere in contrast to the noise and congestion in other parts of the town (Cowan, 2002).

In this framework, in the following, it is tried to present a distinct definition of greenways, examine their different types, and the possibility of their integration. Then, Kan River valley as a multi-purpose urban green corridor which has an important impact on Tehran skeleton, is studied.

3. Research questions and hypotheses

- What is the importance of urban green ways and what is their role in the cities?
- Do Greenways beds, in terms of ecological and environmental features, have the ability to integrate with other functions like recreational and historical functions?

Some greenways are recreation oriented, emphasizing trails, parks and even scenic drives. Some are principally for wildlife, striving to preserve habitat and routes of travel for animals. Others aim to buffer development and provide a strip of green relief in the urban fabric. Still others focus on cultural heritage and history (Flink & Searns, 1993).

This paper suggests that greenways are more than just parks or amenities, greenways represent an adaptation-a response to the physical and psychological pressures of urbanization. However, it seems that green ways can have more than one function, and due to their bold role in cities and urban skeleton and the quality of urban life, corridors may be found or designed that have all environmental, recreational, social, and historical potentials.

4. Green ways

The word greenway brings two separate forms to mind: "Green" represents accommodations such as forests, rivers, and wildlife, and the "way" is implying a path or road. These two words, when combined, describe the crossed paths or corridors with landscapes, which otherwise would transform through development.

Greenways are natural corridors that could pass through urban landscapes which have transformed by

development. This means are a low-cost ways to help maintain the integrity of urban environmental infrastructure. Greenways represent a relatively new form of urban parks that are connected in the networks and mostly use the abandoned rail lines or the restored edges of rivers. They create unique recreational forms in water trails, bike paths, public gardens, agricultural lands and pedestrian trails to schools and other public purposes (Watson, Plattus, & Shibley, 2003).

On the one hand, Greenway is a Living Network in order to provide public access to open spaces near their neighborhood, and in order to connect urban and rural areas to the cities and suburbs close to large Ring networks (Shabani, 2006).

In natural areas, the ecological corridors are associated to a natural space little or nothing changed by human action, such as the banks of rivers or large forest areas of untouched vegetation, among others. In these natural areas, the genetic exchanges between plant species and the promotion of biodiversity and fauna are significant, in addition to functioning as air filter and water, as they promote water and particles retention. But, in urban context, the concept of ecological corridor will not apply since the human presence is predominant. So, in urban environment, the concept of urban green corridor allows, at first, to contribute to the improvement of urban environmental quality. Problems such as air pollution, noise and temperature are mitigated by the effect of vegetation in urban areas, as well as the fact that these corridors promote mobility by soft ways. Beyond the impact on improving the quality of urban environment, urban green corridors provide in urban environment, analogous conditions to ecological corridors, in other words, promote the increase of biodiversity, the free movement of species, water infiltration, among others (ROCHA & RAMOS, 2012).

This definition describes Greenways as gathering people together, providing open spaces to all people at a place close to their neighborhood, vital protectors of water, fisheries, wildlife and recreational resources, and forming corridors connecting open spaces, parks, forests and deserts, optimal way in terms of environmental and ecological terms. The word green as a core environmental term, in the broad sense is used for the path for flow of people, animals, air, water, and plants. Greenways are networks of linear elements including lands which are designed and managed for multiple goals such as ecological, recreational, cultural, aesthetics and other goals which are consistent with land use, sustainability and planning concepts. In a developed urban landscape, Greenways have a dual function:

They make open spaces for public access and recreational use and improve them. In a broader sense, Greenway is a general term for a range of urban open

spaces which make connections and thereby facilitates the communication and prevails a kind of movement in the urbanized context. These pathways may include bike trails, wildlife corridors, restored edges of beaches or pedestrian trails or ghosting of trees along a creek or river mouth that had been drawn up some distance away from the city (Watson et al., 2003).

Greenways are a response to growing public interest in outdoor recreation -Walking, brisk walking and cycling. In this way, they are low-cost ways to satisfy these functions; because the potential sites with relatively narrow corridors are often located in lowlands, floodplains, abandoned rail corridors and other undeveloped areas. Greenways provide tools for natural resource, cultural and historic protection which would be available with their design. Ecological Greenways are valuable as corridors of wildlife movement and location of plant species. These paths create buffer zones of vegetation filter for sediment contamination from runoff streams along the edges. As green landscape, they effectively mitigate air pollution and micro-climate of cities.

Greenways as linear spaces include elements of planning, design and management and are defined with multiple ecological, recreational, cultural, aesthetic and ... objectives (Turner, 2006). Greenways movement to achieve goals such as the protection of nature and landscape, protection of natural heritage and provide opportunities for public recreation planning has led to increasing success. Benefits of Greenways planning and implementation are very diverse (Ribeiro & Barao, 2006).

Protection of important natural ecological systems, providing extensive opportunities for public recreation within the urban and rural areas, providing economic benefit and protection of cultural values and heritage are of its advantages. These Greenways, by establishing recreational trails provide opportunities for spare times of urban residents (HANACHI & GHAZNAVI, 2009).

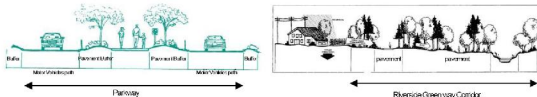


Figure 1. Different types of green corridors (HANACHI & GHAZNAVI, 2009)

5. Greenways importance

Green spaces are of great importance in urban environments. The main reasons for the importance of green space and Greenways can be outlined as follows:

- maintaining environmental quality: Greenways and green spaces increase environmental quality. Greenways and green spaces are essential for the

maintenance of environmental quality. This becomes more important about the rivers and streams. Natural Greenways along rivers and stream, constitute corridors which have the most important role in protecting water quality. In addition, the corridor provides a good place to spend leisure time. Despite the fact that currently one-third to two-thirds of the world's landscapes are Greenways and green spaces; there is still a large part of the landscape that can be identified by planners and the network of green spaces and greenways. The higher environmental sensitivity of the landscape (mountains, swamps and lakes), the greater part of the landscape should be considered as part of the network of green spaces and Greenways.

Environmental benefits

- Air quality
- Biomass and arboricultural arisings
- Carbon dynamics
- Climate amelioration
- Energy crops
- Erosion control
- Flood risk alleviation
- Noise abatement
- Slope stabilisation
- Soil quality
- Sustainable urban drainage systems (SUDS)
- Water quality

Social and economic benefits

- Access and accessibility
- Culture and heritage
- Economic regeneration
- Education and learning
- Neighbourhood renewal
- Physical health
- Tourism
- Well-being and quality of life
- Woodfuel economics

Figure 2. Benefits of green corridors

- Economic benefits: The economic benefits of green ways can be outlined as follows:

A: Greenways and green spaces, if planned in an appropriate way, can attract a lot of tourism in national levels and even beyond to the region, which can have a direct impact on economic growth.

• B: Greenways and green spaces can make a major contribution to the basket cost of the citizen (leisure). There Greenways and green space in an area can enhance property values in the area and increase its quality and desirability. In fact, favorite climate and landscape which is formed by green spaces and greenways can enhance the value of assets (Shabani, 2006).

In designing greenways, urban design skills, engineering-technical techniques, biological sciences, and local community involvement can get together in new methods. Other designing policies include the following:

• Define the corridor to be big enough to provide flexible and multiple connections and associations.

• Emphasis on comprehensive approaches to prioritize and focus on a set of goals. This way you can keep the plants at risk, a place for people to walk, regional land associated with residential neighborhoods and the development of floodplains should be avoided.

• keeping broader greenways in mind - in conjunction with all other present and future possibilities - to define the initial area.

• Define the points of origin and destination, to give a sense of logic and based on the points of interest and appealing to the city to be built.

• Determine the actual ability of organizations and community-based projects that support the current coupled with anticipated long-term operational phases.

6. Types of Green ways in terms of location

1 – Greenways along urban rivers (or other body of water), are usually created as part of a redevelopment plan (not entirely) on the lost or destroyed edge of urban rivers.

2 - recreational Greenways, trails and paths with different characteristics, often over long distances, based on natural corridors as well as canals, abandoned rail beds and public trails.

3 - ecologically important natural corridors, usually along rivers and streams and foothills in order to provide favorable conditions for the migration of wildlife and the various forms of life, nature study and hiking in nature.

4 - Sightseeing historic routes, usually along a road, highway or waterway, in effort to provide pedestrian access along a route.

5 - Comprehensive Greenway systems or networks, usually based on natural land forms such as mountains, valleys and fields, but when Combine Greenways optimistic and open spaces in a variety of

options for creating a municipal or regional green infrastructure (Watson et al., 2003).

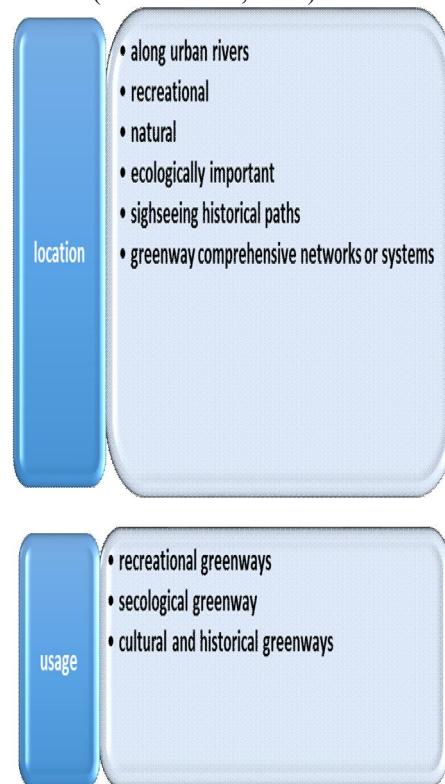


Figure 3, Types of Green Ways

7. Types of Green ways in terms of usage

1- Recreational Greenways: This type of Greenway is a combination of walking paths and different corridors which are located in the corridors and streams. Usually are very long, and include paths which have visual quality so that users pass the visually important and diverse perspectives. Many ideal recreational green spaces and Greenways have emerged where trails and paths are crossed with the river and watercourse areas and entertainment venues.

2- Ecological Greenway: ecological Greenways are open spaces and important natural hallways and are often located along rivers, stream and hills. Protecting ecosystems and natural systems, these Greenways protect and restore water resources, and ground water recharge areas and wetlands are effective in improving the diversity and range of environmental conditions. These Greenways can provide proper places for migrating wildlife, conservation of biodiversity and the proprietary nature.

3- Cultural and historical Greenways: these greenways are cultural values and heritage places and ways. These path are considered for attracting tourists and providing training, Vision, recreation and economic benefits. The green routes are usually along a highway

and most of them provide access for pedestrians to walk along the path and location of the machine. They also have been effective in protecting water resources and flood prevention and provide infrastructure for non-motorized vehicles and pedestrians (Fabos, 1995).

8. Case study: Kan, Tehran, Iran, multipurpose Greenway

When we move from East to West of Tehran, along the North - South, seven major river valleys can be seen. They include: Darabad, Golabdarreh, Darband, Velenjak, Darakeh, Farahzad, and Kan.

River valleys in the north of the city, are as deep valleys, but when they flow through the city, for the lower depth and older history of urban texture, are almost as cored cement canals. These river valleys flow in a city, where there are no river within, and are considered the most important resorts for citizens of Tehran, so that the mountain ranges in north of Tehran, Darband, Velenjak, Darakeh, Farahzad and Kan are used for leisure activities by the majority of people in Tehran (Hamidi, Habibi, & Salimi, 1997).

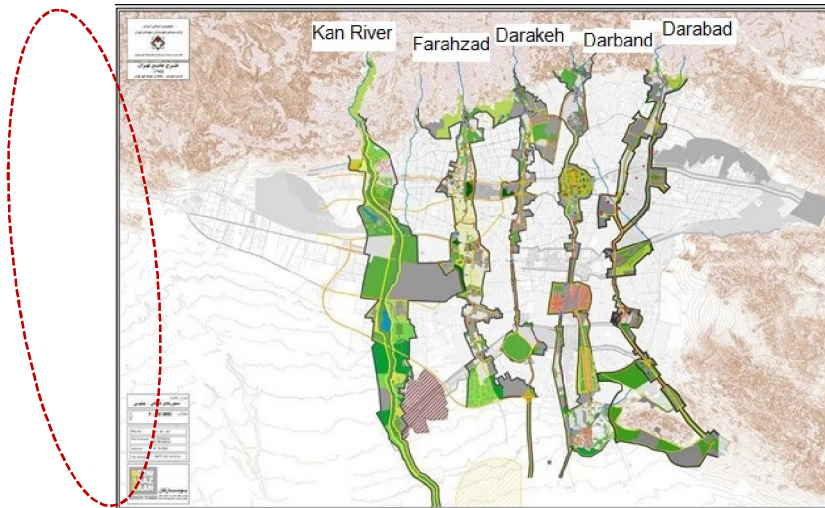


Figure 4: North-south axis of the city of Tehran (river valleys), River Valley of Kan in the Left, (Supreme Council of Planning and Architecture, 2007)

9. Kan Watercourse

Kan watercourse is the longest watercourse in Tehran, which is located in North West of Tehran, and Kan River, which is originated from Alborz heights, is flowing in the watercourse. Kan axis, is the west axis of the north – south in space - performance networks of Tehran.

The main feature of this axis is a continuation of the Kan River from north to south. Strong presence of the watercourse in the body of the City, provides a continuum of integrated water element and physical space of the city, for the provision of adequate water flow to the River, further it is the only axis along where no highway is still made. It includes the last garden of the city, the main stadium of the country and a deep pit on its side, and in parts of its route, it passes from the airport and the runway.

Specific Plan area adjacent to Kan watercourse as a regional action plan to scale in the Tehran Comprehensive Plan, 2006, has been approved in Tehran area 18. Area of the limited region is over 312 hectares. Spatial characteristics and applications based on the ability to provide significant recreation and tourism and the valuable ability to turn chaos into

the River, "axis for the livelihood of Tehran"; coordinating the movement of the center of Cannes, on the margin of the river is by establishing two street on sides of the route.

Creating space -oriented continuity and sustainability, by environmental and landscape and linear park designs is important for the region. Also, in the eastern and southern boundaries, this area has many capabilities for development of leisure, which can act as a strong central to the southwest of Tehran. In addition, the Kan River, near the West within this zone, has made possible role for the center of tourism for the zone.

General strategies to mobilize and strengthen the overall performance of the center are as follows:

- organizing residential areas with activity centers
- Creation of recreation, parks and cultural and green space, with trans-region functions
- Organize activities to be integrated in order to communicate with each other
- Development and implementation of public spaces by prominent pedestrian activities

- Compensate for the discontinuity for the railroad crossing the region

Kan axis and particularly Kan River with the ability to convert to a permanent base in Tehran, has an important role in improving the quality of urban landscapes and open green areas and is considered an important element of Tehran. Unfortunately, incorrect operation, strongly visual pollution of water and lack of notice to physical space on the river have made this naturally valuable axis to be non-regulated. Kan axis in Tehran Comprehensive Plan (2006) is defined as a key tourism center and as an element of structural integrity and identity when various activities organized around public spaces.

Thus, the public spaces and the natural water within and around Kan River has caused the promotion of dignity and physical space to create a panorama view of the city and urban green spaces.

Mentioned points show that the Green corridor of Kan River is a place for social life in all seasons which would be different due to season and temperature, park and landscape and type of usages. vicinity of open public space with orchards and old gardens along the river is considered as one of the reasons for delicacy and attractiveness of this region, which in addition to strengthening the ecological characteristics of the city, enables people to take advantage of the good weather on different days, the factor that is important in strengthening the sense of belonging to a place and its acceptance by the users. There are many different places to sit and rest, welcoming people, especially the elderly and playing area for children and adult sports equipment needed for the sport which results in its attractiveness and welcome more and more people with a wider range of age.

Finally, according to the above results, and despite the existing deficiencies, Kan River can be called as a space for social morale boost, and an appropriate site for the establishment of social interaction in public space. Besides the fact that taking into account the results of this research, and considering the characteristics which has caused the desirability and social life in the largest city of Iran, these factors can be extended and generalized, and the experience of building this greenway can be used to create similar spaces in other cities and other parts of Tehran.

10. Result

There are many different types of green corridors. When considered collectively as a wider green infrastructure, they can create an extensive and powerful recreational, cultural and community facility, improving environmental quality and health, as well as providing diverse and species-rich habitats.

10.1. The multi-objective greenway

They were intended to help heal the human psyche by providing alternative corridors that offer attractive visual form and, in most cases, greenery and solace. Although this Generation greenways also serve this mitigating functions, they have a significantly broader mission. In addition to serving human needs, which remains a vital aspect of multi-objective greenways, the notions of land and resource stewardship are now integral components of this new iteration of the greenway concept. These new greenways pursue multiple objectives such as habitat protection, flood hazard reduction, water quality, historic preservation, education, interpretation, and other purposes.

Multi-objective greenways represent an adaptive and mitigating process, but on a much wider scale. In the latter half of the twentieth century, the impact of human settlement has become explosively pervasive as development has expanded exponentially.

In the face of these changes, greenways are now seen as a potential tool to help address a range of issues including destruction of habitat, loss of biological diversity, degradation of water quality, erosion, flood damage and other considerations. This new view of greenways is seen in projects such as Kan River green corridor. This thinking helps provide a new perspective on greenways and their potential to serve both humans and nature. Greenways are now seen by many as more than amenities for beautification and recreation. They can also help sustain threatened ecosystems. It should be noted, however, that as these concepts were being formulated, and warning flags were going up.

To help meet this challenge, greenways, and the term 'greenway' itself, have become a marketing tool and rallying cry. Greenways can bring abstract and complex notions of land stewardship home. By visiting greenways, a broad cross-section of people can conceptualize and experience the benefits. To this end, it is important that the 'people' side of greenways not be neglected. Although the new generation of greenways strive to provide habitat and infrastructure benefits, they must still be accessible public amenities for exploration, recreation and solace. Indeed, it is these needs that have been the traditional, underlying driving political and economic force behind greenways, and will help insure public support for them in the future. Perhaps, nature writer Robert Pyle best captured this concept when he wrote about a greenway along Denver's Highline Canal: "When we lose our ability to contact the common species .the ordinary everyday species in our immediate vicinity, they might as well be extinct, in one sense. These humble little places where a kid can still go and not do damage, can have an enormous impact in creating a

national character that cares for the land" (Pyle, 1993).

11. Conclusion

By disrupting the connection between city and countryside residents, the cities have become a prison. The only remaining way to escape this prison is weekend migration to the suburbs or out of town. It is here that the importance of urban green spaces as a place for leisure and escaping from urban life is revealed more than ever. However, restoring the natural environment in the urban areas and strengthening opportunities and overcoming constraints and threats or turning them into strengths and opportunities in the form of performing strategic plans, the revitalization and re-link between human and nature can be approached.

11.1. Green corridors are linear features of mostly open character, including canal

Towpaths, riverside paths, footpaths, cycle ways and bridleways, which act as wildlife corridors and attractive, safe off-road links between residential areas, open spaces, urban centers, leisure facilities and employment areas. They also give residents access to natural green space and the open countryside and provide opportunities for recreation. Green corridors increase in value if they are linked to form a network that extends within and beyond the borough boundary.

To improve the quality of life for all people in Tehran through the Kan River green corridor and open spaces that are clean, green, safe and sustainable, by:

- Protecting existing open space.
- Providing open spaces play spaces and access to local biodiversity.
- Creating safe, attractive and accessible spaces for all
- Improving the standard of management and maintenance.
- Actively involving the community in their local open spaces.
- Increasing participation in open spaces.

Therefore, Kan River can be considered as Greenway with multiple social, historical, recreational and environmental functions. And citing these good examples of urban Greenway, a new group of Greenways as multi-functional Greenways can be added to current ones.

Corresponding Author:

Sepideh Payami Azad
Department of Urban Planning and Design, Kish International Campus, University of Tehran, Iran
E-mail: sepideh.payami@ut.ac.ir

6/3/2013

References

1. Burga, Hector Fernando. (2008). RIVER+ CITY+ LIFE: A guide to renewing toronto's lower don lands by stoss landscape urbanism [EDRA/Places awards 2008--planning]. *Places*, 20(3).
2. Cowan, Robert. (2002). *Urban Design Guidance: urban design frameworks, development briefs and master plans*: Thomas Telford Services Limited.
3. Fabos, Julius Gy. (1995). Introduction and overview: the greenway movement, uses and potentials of greenways. *Landscape and urban planning*, 33(1), 1-13.
4. Flink, Charles A, & Searns, Robert M. (1993). *Greenways: A guide to planning, design, and development*.
5. Hamidi, Maliheh, Habibi, Mohsen, & Salimi, Javad. (1997). *The Urban Structure of Tehran* (Vol. 2). Tehran: Tehran: Technical Consulting Organization in Tehran.
6. HANACHI, S, & GHAZNAVI, M. (2009). GREENWAY PLANNING FROM LOCAL TO COMPREHENSIVE PLANNING OF NATIONAL MULTI OBJECTIVE ROUTES. *HOVIATESHAHR*, 3(4), 59-70.
7. Hough, Michael. (2004). *Cities and natural process: a basis for sustainability*: Psychology Press.
8. Pyle, R. (1993). *Thunder tree: lessons from a secondhand landscape*. New York: Houghton Mifflin.
9. Ribeiro, Luís, & Barao, Teresa. (2006). Greenways for recreation and maintenance of landscape quality: five case studies in Portugal. *Landscape and urban planning*, 76(1), 79-97.
10. ROCHA, MARTINHA ERR, & RAMOS, RUIAR. (2012). Network of Urban Parks and Green Corridors in the City of Braga, Portugal. *Advances in Environment, Computational Chemistry and Bioscience*(31), 205-210.
11. Shabani, Negin. (2006). GreenWay Planning: Campiling of Recreation and Protection in Urban Landscape Darrakeh River Valley as a Case Study. *Environmental Sciences*(11), 65-76.
12. Supreme+Council+of+Planning+and+Architecture. (2007). *Tehran Master plan with strategic approach*. Tehran.
13. Turner, Tom. (2006). Greenway planning in Britain: recent work and future plans. *Landscape and urban planning*, 76(1), 240-251.
14. Watson, Donald, Plattus, Alan J, & Shibley, Robert G. (2003). *Time-saver standards for urban design*: McGraw-Hill New York.