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## Green Landscape Networks; The role of articulation in the integrity of green space in landscapes of contemporary cities of Iran

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### Abstract

Following the environmental, social and identity problems in cities generated by urban expansion and invasion of built spaces to natural spaces, the green spaces are recognized not only as green fragments that are in contrast with urban masses, but also as effective factors in enhancing the citizens' lives. Currently, natural infrastructures and green networks are considered as the main urban structures that take into account all the qualitative and quantitative aspects of the city. Recently, multiple measures have been carried out to develop green spaces in t cities of Iran; however, they have not been effective in achieving the expected quality. Studies reveal that the main reason for qualitative deficiencies is the partial and one-dimensional view to this category in the macro-scale – i.e. ignoring a proper relation with other structures and social, economic, and environmental urban functions - and the existence of incoherent green network components in the micro-scale. This paper aims at finding the appropriate approaches and strategies for resolving the qualitative deficiencies of green networks in contemporary cities of Iran and to scrutinize the necessity for existence of an integrated and coherent green networks in city structures through the historical and content analysis of the past and present cities of Iran. Moreover, it tries to seek the criteria for the formation of green coherent networks in terms of physical and semantic aspects. The research studies indicate that green infrastructures should be connected to other infrastructures, and different environmental, economic and social features of the city in multidimensional aspects in order to solve the inadequacy problems of green spaces. Additionally, this connection should be established between the components of the green network in order to preserve its formal, semantic, and functional cohesion and integrity. This paper proposes the articulation strategy as a landscape approach to realize the internal and external cohesion of the green city network. In other words, articulation, with emphasis on the physic, function and role of identity in the urban green structure, formulates a basis for the organization of green spaces in relation to other urban structures and can be regarded as a factor for enhancing quality. Moreover, articulation created by an integrated network of green spaces would lead the citizens to better understand and perceive the landscape and natural environment, and eventually enables legibility and identity in the city.

**Keywords:** *Urban infrastructure, Green network, Articulation, Landscape connectivity.*



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## Introduction

Currently, interventions in cities have disrupted the urban landscape and imbalanced the urban networks and natural networks, so that urban networks are dominating vulnerable ecological networks (Cook and van Lier, 1994). This has led to redefinition of the modern relationship between man and nature in various types of sciences through the issuance and formulation of sustainable development guidelines and statements, including the Rio Declaration, which focuses on new relationships between man and nature and the surroundings environments based on a profound recognition of their principles and their interdependencies; (Alehashemi, 2015), as well as Mcharg's ecological approaches (1969) and Forman's urban ecology approaches (1990), which have focused on ecosystem concepts. In fact, researchers have suggested that ecosystems should be considered as a type of infrastructure since the 80's (Yu, 2012).

Following the advancement of landscape studies after 2000, the definitions were mainly expressed in association with the concept of urban landscape ecology that connected the spatial-temporal patterns with ecological processes (Dabiri and Masnavi, 2015: 69). These concepts eventually led to representation of landscape urbanism concept, in which the city is designed based on city landscape and natural layers, which are interconnected with social, economic, and cultural layers in multiple aspects. In this approach, the urban infrastructure is considered as a significant tool. Although the term ecological infrastructure was more commonplace before 2004, it was replaced by the term green infrastructure (Cardoso da Silva and Wheeler, 2017) as a more comprehensive and general concept. Earlier, the Green Infrastructure was first introduced by McMahon and Benedict in a book entitled Green Infrastructure. In their definition, green infrastructure is a strategic planning and management network of deserts, parks, green spaces and developmental lands that support indigenous species and promotes the health and life quality in communities by preserving the natural environmental

processes (Benedict and McMahon, 2006).

Following the development of landscape approaches from physical concepts in relation to the ecosystem, to meaningful concepts in relation to human, the infrastructure definition has undergone many changes in recent years. In 2012, the term "landscape infrastructure" was defined as an evolutionary approach for multifunctional and sustainable infrastructure systems in terms of strategic, economic and environmental aspects, aimed at replacing and rebuilding natural resources instead of extensive constructions (gray infrastructure). Alehashemi also uses the landscape infrastructure in water networks as a term that dominates the current situation holistically (Alehashemi, 2015). The landscape infrastructure considers four important issues in an ecology system: the integrity of a system, system performance, phase growth and network connectivity (SWA, 2012).

Indeed, in all the aforementioned theories and ideas, connectivity and cohesion are the keys to achieving the anticipated goals. In the earlier theories, these indices were merely investigated in physical aspects. For instance, Forman believed the optimal arrangement form of land arrangement is achievable by implementing the Aggregate with Outlier Principle (AWOP) and considering the seven principles of natural green patches, the size of landscape mosaic grains, the extent of danger, genetic variation, the boundary region, small green parts, and corridors (Forman, 1995). Scrutinizing the nature and its influence on human behavior in information process theory, Kaplan also explains that people are attracted to landscapes in which human ability to process information is stimulated and the information process is carried out successfully (Bell, et al., 2001: 43-45). They consider the four principles of cohesion, legibility, complexity and mystery as the structural aspects of the landscape, and regard connectivity and cohesion as concepts that lead to quick and tangible understanding of the environment (Kaplan and Kaplan, 1989). The same concepts are more specifically elucidated in relation with infrastructure connectivity to green spaces, which goes beyond

the connecting of green patches and corridors, and emphasizes that connectivity is an integral concept of nature that has become an integral part of a holistic plan in infrastructure planning and design phase. While considering the establishment of cohesion and connectivity in synchronic physics, it creates a diachronic connectivity with the other layers of the city simultaneously, leading to establishment of identity and semantic sustainability. This definition basically refers to a kind of connectivity which is understood with the aim of organizing and arranging a phenomenon as an integral whole in the form of landscape connectivity <sup>1</sup>.

regarding the concepts of ecology and infrastructure and their relationship with each other in order to organize the landscape of the contemporary cities of Iran such as Tehran, partial measures and studies have been conducted, such as the detailed plan of Tehran with an ecological approach in 2002, the organization and conservation plan of agricultural fields by Baft-e-Shahr consulting engineers in 2013 (Kokhaei and Masnavi, 2014), comprehensive land use plans of Abbas Abad since 2002 with sustainable development approach aimed at maintaining the ecological potentials of the region and creating a connection with the adjacent fabrics (Naghsh-e-Jahan Pars, 2005). Moreover, the environmental atlas of Tehran plan which was introduced in 2017, is another urban environment project that has been planned in order to recognize the status quo and solve the problems in Tehran. However, in all of these projects, the semantic role of the natural city components is neglected and considered as additional aspect on whose account the solutions to the environmental problems of the city can be achieved. These partial physical proceedings has not contributed to the formation of an integrated green infrastructure, and they have not resulted in desirable green spaces in terms of composition, spatial distribution, extent and continuity. Although the expansion of green spaces in cities is highly regarded nowadays, the development of these spaces in contemporary cities of Iran is devised as the rapid

increase in green space per capita. According to the reports of the Ministry of Housing and Urban Development, the green space per capita in Iran ranges between 7 to 12 square meters (Asgari, 2002: 20), which is lower than the United Nations standard (20 to 25 square meters (Tavahen, 2005)). The density of urban fabric, high population growth, land scarcity and high added value contribute to uneven distribution of green spaces, which indicates the quantitative inefficiency of green spaces.

More important than physical deficiencies, the lack of a coherent and continuous structure in green networks is the major problem, which has led to creation of fine grains and reduction of viability in urban landscape. Additionally, many green spaces and agricultural lands outside the city have been destroyed due to urban development and this has created a great breakthrough between the natural and the built environment. Inefficiencies of the streams and the river valleys and ignoring their connection to green layers of the city have caused physical disruption and created various problems in all social, economic and other aspects as well as deterioration of city identity. Therefore, green spaces have poorly fulfilled the current requirements of cities. The current paper aims at explaining the concept of green networks as one of the main layers in urban infrastructure, and scrutinizing their special role in relation to other city structures in creating a continuous landscape regarding the historical studies at the macro-level (the historical Isfahan city garden) and through field studies at micro-level (pathology of green network discontinuity in District 7 of Tehran). The main aim of this paper is to seek an answer for the following questions: What type of strategies can be effective in realizing the concept of connectivity (both objectively and mentally) between the green network and the city landscape? Can mere physical connections between the green network components enhance its quality?

### **Hypothesis**

The main cause of poor and inefficient green network

in contemporary cities of Iran is the partial and one-dimensional consideration of natural infrastructure management, the discontinuity of network components and their disconnection with other urban infrastructures. The adoption of landscape approach and adaptable integration with physical, functional and semantic components of the green network through the articulation of its components is a way to enhance the quality of green space perception in interaction with the city. Articulation is an efficient method that can realize cohesion and connectivity in urban green networks. Creating an integrated physic for the green network, this approach offers identity by considering semantic and historic aspects, and has a unique and pervasive concept by connecting to other components in multifunctional aspects.

### **The concept and necessity of green networks in city structure**

According to the principles of ecology, the imbalance between nature and city is a significant problem of cities (Bahramsoltani, 2008). In addition to balancing the natural and built environments, the green infrastructure can be considered as a strategic tool in planning in order to increase the efficiency and energy of urban spaces to achieve sustainable cities and smart strategies to conserve the resources. The green infrastructure encompasses the entire city that can provide multiple benefits when combined with multifunctional functions (Ahern, 2007). Green infrastructure as a natural and semi-natural network, includes green spaces, rivers, etc., that connects the villages and cities. It is considered as a natural-service infrastructure that often functions more economically and flexibly than gray infrastructures to achieve social, environmental and economic goals (LI, 2013). A main advantages of green infrastructure is the a formation of an integrated landscape in the minds of citizens through the interconnectivity of green network components and the integrity of its physical features (patch, corridor, and green matrix) and their adaptation to other layers of the city landscape. The lack of a coherent green network in

addition to the unsustainable development of cities leads to the loss of the natural city infrastructure, and disrupts legibility and visual features of the city. Having studied the mental and physical aspects of an integrated green network, it is revealed that it can generate unity and order in the city in addition to promoting identity and historical aspects of the city. In other words, this network shapes the overall and central landscape structure of the city by adapting to different cultural, social, historical, and ... layers and creation of a multi-layered connection between the layers. The existence of a coherent network that is integrated in terms of form, function and meaning implies the quality enhancement of urban spaces and a better understanding and perception. Connectivity is a vital principles for green network structure, since it influences the sustainability of green space both in terms of structure and function, and consequently affects the sustainability and spatial cohesion of cities, the improvement of bioclimatic conditions, the creation of natural ecosystems in urban environments, the improvement of urban life quality, and increasing of the viability in cities (Khansefid, 2008: 147). Therefore, it is an imperative to restore the connectivity of the green network internal components (patches and corridors), that are disconnected due to urban developments, and to adapt and connect them with other external elements (both objectively and mentally). This will lead to perception of the green network as a whole. In landscape ecology literature, the term connectivity is used to express the continuity, and focuses on the physical aspects of green networks. Since this paper considers the green network as s tool beyond the scope of the green physical spaces and regards content values for it, this term cannot fully express the deliberated meaning. Therefore, the term “articulation” is used to express the concept of continuity and the cohesion of the green network, and the term “articulation” will be recognized as the strategy for achieving green network connectivity.

### **Green articulation**

Despite having a long history in the fields of

architecture and urbanism, the concept of articulation is rarely used in urban landscape literature; while this concepts are intertwined with city structure and landscape of many Iranian cities, such as garden cities in various aspects.

On the one hand, the term “articulation”<sup>2</sup> refers to the place of detachment and separation, and it refers to the place of continuity and connectivity, on the other hand (Bostani, 1998: 802). It has both the connecting and disconnecting entities. This term refers to the intermediary space between two things that shape an articulating combination as a whole. The quality and formation of this connection depends on the quality and entity of the existing phenomena, and the order in the articulations depends on the existence of an independent entity through environmental order (Mirmiran and Vaezi, 1989:60).

The green articulation indicates the green network components, each of which imply an independent concept (detached entity) and, at the same time, create a green network by connecting and joining the components (connectivity entity). In this manner, the green articulation, either in the form of a patch or green corridor, presents all the concepts and features of an articulation in a green network.

Regarding the position and interdependency of the components and alike the concept of articulation in architecture, the articulation is defined as a place (the main space expressing the situation and location), a path (the main transitive space with a defined direction), and transition (the subordinate space in transition from internal spaces to external spaces or for changing from the current situation to another) (Norouzi, 2013);(Fig.1). The green network components are also considered a type of the following articulations:

- Green corridor (path articulation)
- Green patch (transition articulation)
- Other city structures (place)

These three components are the components of a green matrix in an articulate combination (Fig. 2). From the functional and semantic points of view, the components can be regarded as the focal points,

the milestones, and the destinations. As a result, the corridors do not function as articulations that connect the components in urban landscape ecology. In this arrangement, the patches contribute to this integration and perform as the main articulation in green city system that encompasses the fine-grained network components and create bigger patches of green matrix. Thus, the corridors are not just transiting paths, and the green patches are not just green masses in the city fabric, and their identities are recognized through combining diverse social, economic, cultural, and other functions. These components are interrelated; in other words, each component has an independent identity and concept, which affects and influenced by the adjacent components in an interactive process. Therefore, this interactive relationship provides integration in the form of a holistic landscape.

### Criteria and indicators of green landscape networks

The emergence of an integrated green landscape network in which the components act as articulations is resulted from three criteria of physical cohesion that is congruent with their mental connectivity and multi-dimensional structure. In this situation, the green articulation is considered as a spatial and multi-dimensional element that can perform as an

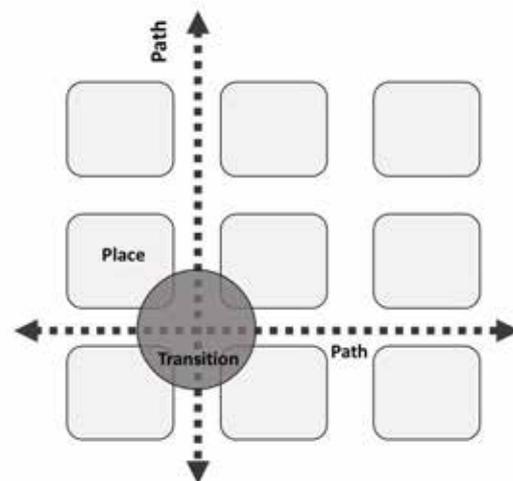


Fig. 1. Theoretical model of the space intermediating the place, location and transit space in architecture and urbanism concepts. Source: authors.

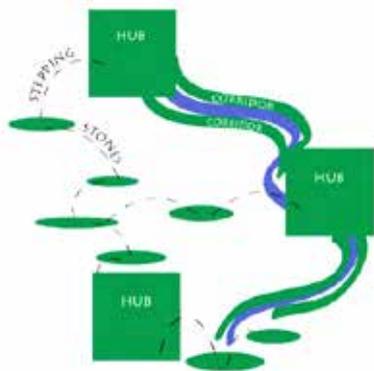


Fig. 2. Theoretical model of the connected ecology network structure in cities; the corridors as path articulations that can be joined to the natural corridors of the city; large green patches, such as transition articulations that are connected to each other by smaller corridors or patches; white areas are. Source: Youngquist, 2009.

intermediating space in an articulate arrangement. A set of articulate combinations, whose components are in meaningful relation to each other, shape the entire green network in the city (internal order of the network), which is in meaningful in relation to other layers of the city landscape (external order of the network). The use of “landscape” term for green networks refers to the same internal and external system order and to the multidimensional and comprehensive connection to other layers of the city. Regarding the subject of this paper which is the connectivity of internal components of the green networks, the following indicators are recognized as the indicators of green landscape network, provided that the three indicators are realized simultaneously.

**Physical coherence:** The continuity of the nature from outside the city is provided by solutions such as green belts, the spread of large green patches, or the exploitation of natural corridors such as the river valleys and extending them to the city in order to provide connectivity. Furthermore, connecting smaller green patches in the city fabric through natural and built corridors, as well as preventing the discontinuity of the corridors by extending them to the green patches in the city can lead to formation of a coherent green network. This

network can be considered as one of the major city layers and induce the formation of urban spaces, or it can be connected and combined with other layers (not as an extension or a secondary layer) (Khansefid, 2008: 154, Kokhaei and Masnavi, 2014: 570-571, Chicago Metropolitan Agency, 2016: 2; Benedict and McMahon, 2002: 12-17; Ely and Pitman, 2014: 35-36). Multi-functional structure: From a functional point of view, green infrastructure is the most efficient way to solve the climatic and environmental problems caused by a limited vegetation in high density cities (Yuhong, et al., 2011). Moreover, open spaces and greenspaces play a vital role in shaping the interactions and productive encounters of the citizens and can improve their cultural life and provide a context of education. Green spaces have the potential to be transformed into recreational and leisure centers. They can also provide the opportunity for social justice for all age groups. Additionally, ecosystem services provided through green infrastructure can provide a healthy environment with physical and mental health benefits for the people (Tzoulas, et al., 2012). Also, the economic flourishing of an area is due to the increase in land value and reduction of urban management costs. Hence, the green network will be interconnected with social, cultural, economic and ... layers of the city and offer advantageous results. Semantic connectivity: Having articulate components, green networks manifest various features such as connectivity<sup>3</sup>, correlation<sup>4</sup>, balance, hierarchy<sup>5</sup>, and the creation of territory and privacy<sup>6</sup>. The green articulation has the ability to create an integrated perception and understanding of the green network phenomenon by creating an integrated physic through arranging the components of its composition in relation to other compositions. The articulate elements of the green network, both natural and built elements, provide urban legibility and serve as the basis for the organization of other parts of the city (Alehashemi and Mojtahedi, 2013). Therefore, the coherence of the green network not

only forms a coherent network of green milestones, but also provides a context for controlling the quality of urban landscapes by organizing other milestones and defining the physical and mental principles (Fig. 3).

### Scrutinizing the articulation of green landscape structures in the landscapes of Iranian cities

Articulation as a method for creating integrity in the urban green network can stimulate the interaction of

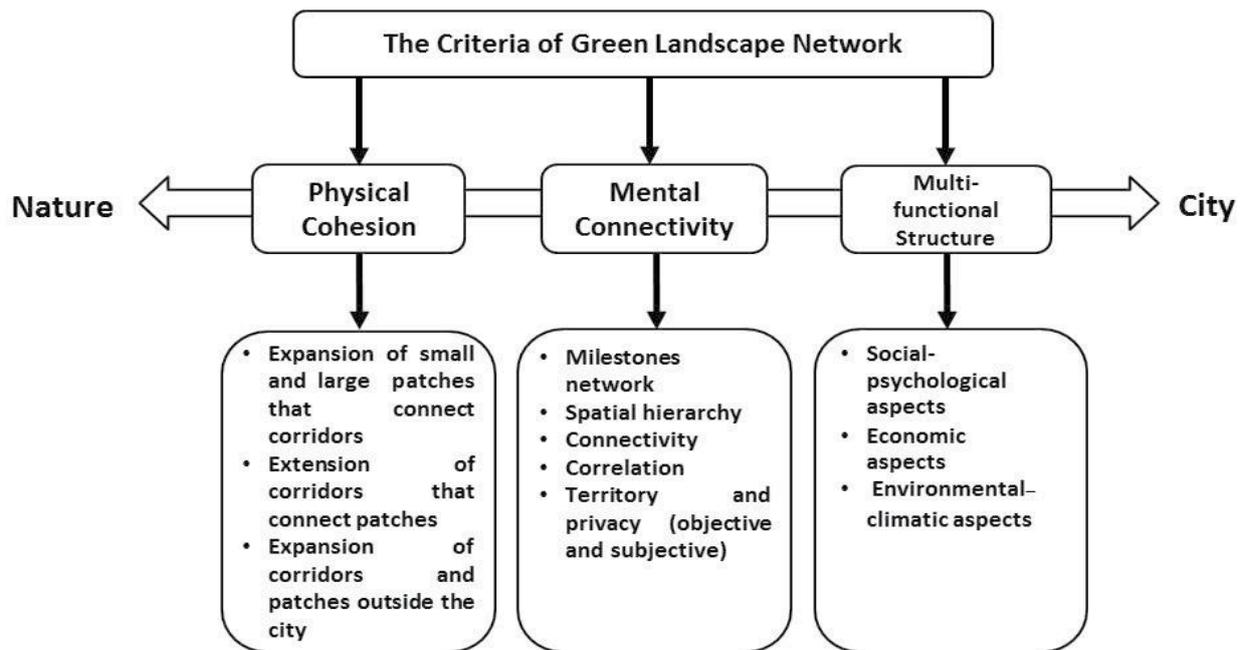


Fig. 3 .Criteria and indicators for the formation of green landscape networks in the city. Source: authors.

nature and city through conservation, rehabilitation, development, and quantitative and qualitative promotion of green spaces. The focus of this research on landscape is due to high potentials of landscape in planning, management and adaptation of green urban infrastructure with other infrastructures (such as the road network) in a holistic approach and the ability to induce the connectivity of different city layers in multiple dimensions. Here, two types of past and present Iranian cities (Isfahan, garden city and District 7 of Tehran) are scrutinized.

#### Macro level

Green infrastructure in the form of an outsourced order is a factor for solving the deterioration of urban fabric and formation of the whole unit. Having combined the coarse-grained green components, articulation prevenst the occurrence of fine-grained

components and offers a physical, semantic and functional unity between the green natural and built components. The green spaces are distributed by maintaining and establishing connections between natural and built natural patches inside and outside the city and the combination of smaller green patches and the promotion of connections in natural and built ecological corridors of the urban environments (Khansefid, 2008) that eventually leads to organization of diverse urban functions. Studies reveal that past Iranian cities have a long history of integrated and unified green structure, due to their appropriate structures and patterns in the form of gardens cities.

For instance, according to Tavernier observations, in the garden cities of Isfahan during Safavi era, each family had a separate house and each house had a specific gardens and the city looked like a forest

from a long distance (Tavernier, 1984: 64). The main components of the green structure were shaped due to intersection of Zayanderud River natural axis and Chahar Bagh built axis that organized the urban fabric with the natural network in a system composed of water, vegetation and land. Chahar Bagh and Zayanderud divided the city into four districts which consisted of thirty gardens (Kaempfer, 1981: 196). In fact, these two main corridors were the intermediating spaces that arranged the main elements such as the gardens while articulating other elements. Performing as a linear articulation, the Chahar Bagh axis offered cohesion and connectivity in spatial organization of the city (Habibi, 2007) (Fig. 4). This concept was manifested in accordance with the principles of idealism and ideological naturalism such as order, coincidence, innovation, social environment planning, ecological balance, and the concept of utopia (Hyderabadi, 2012) in Isfahan garden city which is arguable in terms of physical, functional and semantic aspects (Table 1).

### Micro level

The green structure at this level involves the organization and creation of connectivity between natural and built patches and corridors. In metropolitan areas such as Tehran, the urban landscape is deprived of an integrated natural infrastructure despite the abundance of green patches due to the absence of meaningful relationship in form of a systematic structure. The green spaces in Tehran are expanded according to one-dimensional approach that takes the green area increase of per capita into consideration. In addition, the absence of a specific structure and pattern for the development of green infrastructures has made all the efforts ineffective while each of the 22 districts of Tehran benefit from the potentials that can facilitate the creation of integrated green infrastructure. The natural and built patches in Tehran include the unrestrained lands on the heights and hills, forest and urban parks, open-air administrative areas, universities and gardens-yards. Green corridors such as river valleys, natural streams,

linear parks, green paths and green spaces along the streets and highways are among the other potentials in Tehran. Here, the green space in district<sup>7</sup> of Tehran will be investigated in which many plans have been conducted with preservation and a minimum development approach with emphasis on cultural and green spaces. Despite the fact that district 7 of Tehran is located in a place with a history of green network including the historical gardens of Qajar period, the green space per capita is very low in this district. However, large green patches such as Taleghani Park and Qasr garden museum can form a continuous and coherent green network by being connected to other vast areas that have no function or improper functions. This network is able to be transformed into a network of landscape marks in micro-level if it is combined with other functional layers, such as economic, cultural, educational, religious, and other layers. Abbas Abad lands are located along Kan, Pardisan and Lavizan hills dividing Tehran into northern mountains and southern plain (Naghsh-e-Jahan pars, 2005). Basically, it implies a physical-mental boundary between two important parts of the city; nevertheless, this area is not organically integrated with other parts of Tehran. This region is not a biological environment, nor does it perform as a part of a whole, and does not provide an independent social and spatial unity to Tehran (Dibaj, 2010) (Fig. 5). Therefore, in order to create the intended green infrastructure, it is necessary to consider the relationship between the four major patches of the

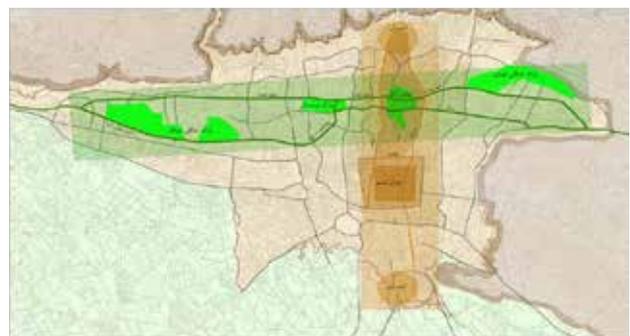


Fig. 5. Green patches in Chitgar, Pardisan, Abbas. Source: Naghsh-e-Jahan Pars Consulting Engineers, 2005.

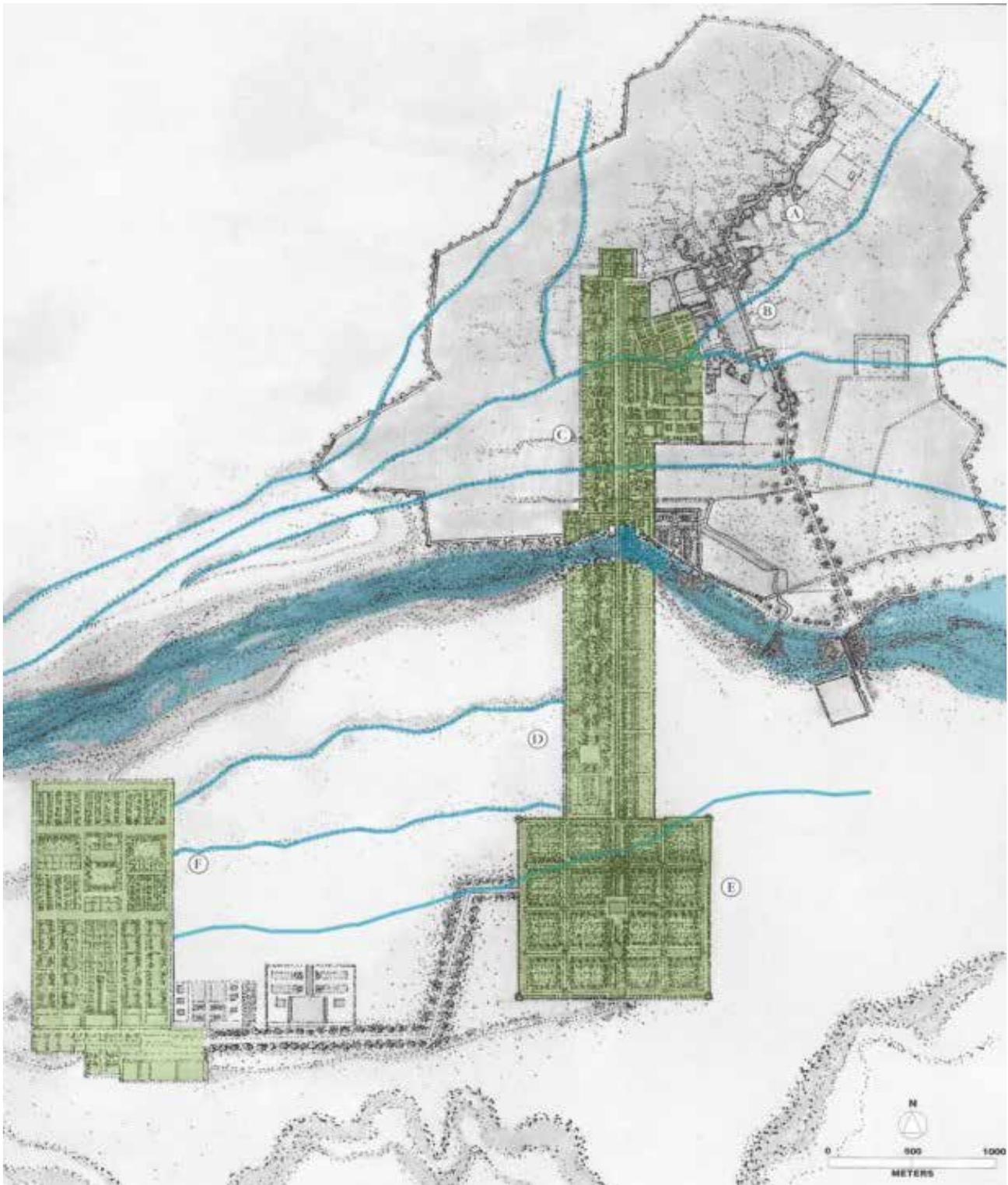
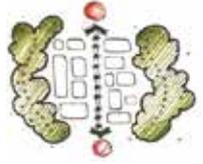
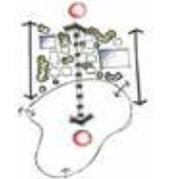
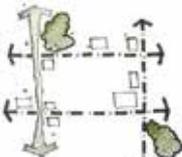


Fig. 4. Chaharbagh built green axis of and Zayanderud natural corridor, the articulate components of Isfahan garden city in the spatial, functional and semantic organization of the main city elements. Source: authors.

Table 2. The evolution of the green network I Abbas Abad in terms of formic, semantic, and functional aspects. Source: authors retrieved. Source: Naghsh-e Jahan Pars, 2005.

	Semantic connectivity	Functional connection	Physical cohesion	evolutions	Schema
Qajar evolutions	<ul style="list-style-type: none"> <li>- Gardens, milestones and signs for the public</li> <li>- Creating mental realm and connectivity between the city center and the city outskirts</li> </ul>	<ul style="list-style-type: none"> <li>- economic, environmental and social aspects in terms of city connection to nature</li> </ul>	<ul style="list-style-type: none"> <li>- Creating connectivity and continuity between the city center and the city outskirts</li> </ul>	<ul style="list-style-type: none"> <li>-Recreational and hunting activities</li> <li>-Agricultural use</li> <li>-Connecting the city center to the northern outskirts of Tehran</li> </ul>	
Pahlavi I evolutions	<ul style="list-style-type: none"> <li>- Undermining the multi-dimensional green network structure by destroying gardens</li> </ul>	<ul style="list-style-type: none"> <li>- Replacing government functions and diminishing of the environmental and social aspects</li> </ul>	<ul style="list-style-type: none"> <li>- The beginning of transition from macro connectivity to micro connectivity</li> </ul>	<ul style="list-style-type: none"> <li>- Extension of urban fabric the northern part of the city</li> <li>- Destruction and alteration of garden function from leisure to governmental functions (prison and garrison)</li> <li>- Preserving of agricultural performance</li> </ul>	
Pahlavi evolutions	<ul style="list-style-type: none"> <li>- Identity change from green network to the urban network</li> </ul>	<ul style="list-style-type: none"> <li>- Change of economic function entity and environmental degradation</li> </ul>	<ul style="list-style-type: none"> <li>- Uniting the boundaries inside and outside the city with the disappearance of green spaces</li> <li>-The transformation from coarse-grained connectivity to fine-grained connectivity</li> </ul>	<ul style="list-style-type: none"> <li>- The emergence of green fabric fragmentation as a result of the extensive residential construction and creation of connecting paths</li> </ul>	
Islamic Republic	<ul style="list-style-type: none"> <li>- The cultural and economic turning point of the city</li> </ul>	<ul style="list-style-type: none"> <li>- The economic function nature and the loss of environmental values</li> <li>-Dispersed social centers</li> </ul>	<ul style="list-style-type: none"> <li>- The abolishment of the concepts of connectivity, continuity, and territory following the formation of high density urban networks and dispersed green patches.</li> </ul>	<ul style="list-style-type: none"> <li>- The city center and the location of the economic, administrative, and cultural utilities, and vast lands of development resources</li> </ul>	

city in a macro-scale and to consider the articulation of the components of the green network in micro-level (Table 2).

### Conclusion

A main reason for poor green spaces in contemporary cities of Iran in micro and macro scales can be attributed to lack of proper n the prevailing attitude to green space development

only considers the partial, quantitative and one-dimensional approaches that focus solely on the increase in green space per capita. The components of green network in contemporary cities of Iran lack connectivity and coherent connection with other functional city layers and structures. The lack of cohesion precludes the environmental, social and economic benefits of green spaces in the cities. Therefore, it is essential to restore unity and integrity

of the green spaces by transforming the partial approaches and common patterns to comprehensive and beneficial approaches. This model should simultaneously take into account the physical and functional connections of the green network in accordance with their semantic and conceptual principles, and induce landscape unity.

Articulation can be considered as a method that offers the anticipated unity in the urban green network and considers the green network as a holistic matter rather than a mere physical aspect. It can also articulate the components in terms of physical, functional and semantic aspects by connecting the components of the green network. Articulation is achievable through creation of detaching-connecting spaces and adopting various measures such as conservation, rehabilitation and development in order to provide physical cohesion in combination with diverse urban functions. In addition to providing solutions for environmental, socio-psychological and economic problems of the city, articulation can lead to connectivity, legibility, identity of city landscape and semantic integration in citizens' minds. Finally, it can induce the formation of green landscape network and landscape infrastructure in order to achieve sustainable cities.

### Endnote

1. In this paper, the concept of landscape connectivity is expressed by redefining the common concept of connectivity and the multidimensional and pervasive connection of the green network components with other layers of the city. The landscape feature of a phenomenon represents a state (an adverb and not an adjective) and an approach that prevail the phenomenon holistically.
2. Currently, in architectural texts, the term "articulation" is used, while this term further implies its detaching feature. However, the term "articulation: refers to both detaching and joining features (the American Heritage Dictionary).
3. Having described the discontinuity, Alexander considers connectivity of articulation, and believes that every kind of interconnection can only be achieved through the intermediating spaces (Chermayeff and Alexander, 1997).
4. Each architectural element is manifested in another size and magnitude in the articulations, and therefore becomes different. This transformation is pervasive and occurs for all elements in the articulation (Rezakhani, 2013:107).
5. Given the fact that dichotomies are often undesirable, the articulation creates a hierarchical articulation, in which the contrasting states are moderated and interposed in some degrees (Bahraini, 2009: 183).
6. Basically, the immediate transfer and transition from a realm to another without the necessary mental and physical conditions is not desired (Tabibian, et al., 2011: 75); therefore, the various intermediate

scales should be considered in the first stage so that the person reaches the desirable physical and psychological condition. This intermediating scale can be related to function, size and even privacy. Benz considers this intermediating space as a communal space (Benz, 1970). The articulation is a factor that can reveal the state of the boundary and privacy state from the physical and the most objective aspects, to the most subjective aspects.

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