

# Urban Landscape Design

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## 1. Introduction

*Peyzaj*, the Turkish word for landscape, originates from French word “paysage” which means scenery. Nowadays, the word encompasses a wider and deeper meaning. While in the medieval period, “landscape” was used as a synonym for “region” and “territory” in most of the Germanic languages, beginning from the 15<sup>th</sup> century landscape became a pictorial genre (Tress & Tress, 2001). The use of landscape as a term in science is relatively new. Today, landscape refers to not only a phenomenon described and analyzed by scientific methods, but also a subjective experience which has perspective, aesthetical, artistic and existential meaning (Antrop, 2005a). It is dynamic and constantly changing. Antrop (2005b) identified four driving forces of landscape change; (i) accessibility, (ii) urbanization, (iii) globalization, and finally (iv) calamities. This chapter is about urban landscapes; therefore urbanization will be the beginning point of this study.

Urbanization has become a worldwide phenomenon after the second half of the last century. Today more than half of the world population lives in urban environments<sup>1</sup>. Urbanization is a complex and multidimensional concept with its spatial, ecological, economic, social and cultural aspects. While urbanization is widely accepted as a foundation of modernizing (Clarke Annez & Buckley, 2009), it has also caused environmental and socioeconomic challenges (Adams & Sierra, 2009). Consequently planning and design of urban areas are faced with challenges to create both ecologically and economically sustainable cities.

Natural landscapes have been dramatically transformed by the urbanization process throughout the world. Consumption of resources is highest in urban environments, which causes negative impacts on physical environment. Traffic, air, water and soil pollution, improper land use and greenhouse gas emissions are some of the major issues due to urbanization. The effects of urbanization process are not only limited to ecological damage, but changing sociocultural and economic structure also affects the quality of physical environment by influencing human behaviors and lifestyles. Indeed, there is a mutual relationship and interaction between physical environment and quality of life. Therefore planning and design of physical environments requires a holistic and comprehensive perspective.

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<sup>1</sup> According to The World Bank data, 51% percent of the world's population lives in urban areas as of 2010. (<http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS/countries/1W?display=graph>)

Urbanization in Turkey gained momentum starting from 1950's as a result of intense immigration from rural to urban areas. This has caused vertical growth in cityscapes and increase of squatter settlements around planned areas which has led to loss of character and identity. Currently there are 81 provinces in Turkey and the urban population is the 76.3% of the total population as of 2010 (TurkStat, 2011). Industrialization has always been the key driving force of the urban development in Turkey. While industrialization and urbanization have pushed the limits of environmental capacity, open and green spaces, or in other words the urban landscape has diminished within the city. Unfortunately, open and green spaces are hardly among the priorities of urban development in the planning system of Turkey. On the contrary, like Jacques-Menegaz (2006) points out; "*open and green spaces are not amenities but necessities in urban life*".

This chapter aims to present the role and importance of urban landscape as a crucial part of urban environments, providing design basics and examples. Urban landscape elements, whether public or private property, are parts of the city's form and texture. Therefore design of urban landscape is inevitably a part of urban design. Hence, firstly, urban design concept and its bond with landscape architecture will be discussed. Then, benefits of urban landscape elements will be examined and basic urban landscape design principles will be presented.

## 2. Urban design

Urban design as a profession might be considered relatively new, but historically it has played a major role in forming cities (Arida, 2002). The concept of urban design has emerged as a bridge between planning and design in response to need for management of modernizing cities in the late 1950's (Krieger, 2009). However, there does not exist a commonly agreed definition of urban design yet, mainly due to its interdisciplinary character. While some try to create a precise and universal definition, some argue that it is unnecessary. Appleyard (1982) states that there shouldn't or can't be a single definition of urban design and points out if the existence of different kinds of urban design is recognized, then it is possible to get a better understanding of the nature of it (Rowley, 1994). There are many viewpoints on what urban design actually is. Traditionally, urban design has been regarded either as a subset of planning or as extension of architecture. On the other hand, one cannot abstract open and green spaces out of an urban environment. Hence, the role of landscape architecture in urban design needs to be understood and accepted as a key part in creating sustainable urban environments. This section does not aim to define urban design, but I believe a better understanding of scope and content of urban design will provide a conceptual basis for urban landscape design.

Urban design can roughly be defined as the art of creating and giving form to urban environments. Urban design involves many stakeholders whose interests and priorities may conflict and the physical product of urban design should serve the community's needs and expectations with its social, cultural and economic outcomes. This makes urban design a highly complex phenomenon; as a result the definition can or should not be limited to physical design.

Although examples of urban design could be traced back to Ottoman period, it, as a concept, was first introduced in Turkey in 1970s, starting from the adoption of the concept by university degree programs. However, the concept has not gone further than being an academic subject and a legal background does not exist, yet. According to Baş (2003) existing urban planning approach in Turkey is basically static and urban design is reduced

to land readjustment. Furthermore, never ending controversies, mainly between urban planners and architects, over “who are the real urban designers” makes the cooperation difficult. On the contrary, compromise between related fields (i.e. landscape architecture, urban planning and architecture) is necessary in order to develop conceptual background for urban design in Turkey. This might also be the basic problem in defining urban design; arguing possession of the discipline rather than focusing on the extent. It is impossible to involve urban design in national development policies without lack of consensus.

In 2010, a national action plan titled “Integrated Urban Development Strategy and Action Plan 2010-2023, Turkey” (KENTGES in Turkish abbreviation) was created by the Ministry of Public Works and Settlement<sup>2</sup>. The action plan is a result of participation process in order to respond to the need for increased life quality and stronger socio-economical structure in urban environments. It is a national document which includes the strategies, policies and actions for sustainable urban development. In this document, the concept of urban design has been primarily linked to the second central axis of the action plan “increasing spatial and life quality of settlements”. The actions related to urban design are summarized as follows:

- To establish interdisciplinary graduate degree programs in universities,
- To prepare guidebooks based on research and development projects’ outcomes,
- To develop methodologies for quality urban design,
- To promote revitalization of urban centers and to establish maintenance, management, finance and participation approaches,
- To develop design solutions for disadvantaged groups.

The integration of urban design in such an action plan seems like promising. However, there is still much work to be done and it is too soon to tell whether the action plan will achieve its goals.

## 2.1 Urban design and urban life quality

Under the course description of “Urban Design: City-Building and Place-Making” at University California, Berkeley, urban design is explained as follows:

*„The discipline of urban design is concerned with notions of the “good city.” It is concerned with how urban environments work for people and support human needs, how physical designs may facilitate or hinder human behavior, how cities look, and what cities mean. It is concerned foremost with environmental quality, measured in many ways but particularly in terms of access, connectivity, comfort, legibility, and sense of place.“*

This statement supports the idea that urban design is strongly linked to life quality. Like urban design, there is no universally accepted definition of quality of life (QoL). The term was first used in USA in the post-war period and later was adopted by many fields such as education, health and, economic and industrial growth (Carr et al., 1996). Despite the technological development and increased income levels, it has been recognized that quality

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<sup>2</sup> In 2011, The Ministry of Public Works and Settlement was closed down by a decree-law and KENTGES studies are now being carried on by General Directorate of Spatial Planning, The Ministry of Environment and Urbanization.

of life cannot be measured through material wealth (Pacione, 2003). According to United Nation's Environment Glossary (1997) the term is defined as the "*notion of human welfare (well-being) measured by social indicators rather than by "quantitative" measures of income and production*". Meanwhile World Health Organization's (1996) definition of quality of life is more comprehensive and as follows:

*"an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns"*.

QoL analyses can be a useful tool for identifying design goals and developing strategies in urban design. On the other hand, measuring QoL and development of quality indexes are challenging processes since they encompass many dimensions (e.g. economic, social, health, subjective, environmental etc.). Livability and sustainability are two basic concepts related to urban life quality. Livability of an urban environment is determined by physical environment as well as social environment conditions, hence urban life quality is a result of two kinds of input; physical/objective and psychological/subjective (Yıldız Turgut, 2007). For this reason, livability and consequently urban quality indicators might vary from one city to another. Parfect & Power (1997) suggest a situation assessment where weaknesses, deficiencies, inherent strengths and advantages are identified before identifying urban quality in urban design. Such an assessment could help to determine the priorities and deficiencies in urban development strategies and policies in both national and local context. Determination of priorities is also important in terms of finance, since cost of urban development is generally very high. As an example; United States Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD) and the U. S. Department of Transportation (DOT) have formed a partnership to coordinate decision and policy making efforts in housing, transportation and energy efficiency. In 2009 the partnership identified six livability principles to guide the federal investments. Developing such principles regarding both natural and cultural values could be useful and guiding in urban design. The principles are as follows:

- **Provide more transportation choices:** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- **Promote equitable, affordable housing:** Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness:** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities:** Target federal funding toward existing communities – through strategies like transit oriented, mixed-use development, and land recycling – to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- **Coordinate and leverage federal policies and investment:** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy

- **Value communities and neighborhoods:** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

Livability principles are strongly related to the concept of sustainability. The environmental damage caused by urbanization is in the heart of sustainability debates. It has become a key issue in development after The United Nations Conference on Environment and Development (UNCED) in 1992, which expressed the concerns for the future of the environment in global scale. Agenda 21 is one of the resulting documents of this conference. It is an action plan and comprises four main sections; (i) social and economic dimensions, (ii) conservation and management of resources for development, (iii) strengthening the role of major groups, and (iv) means of implementation which include detailed policies for sustainable development. Agenda 21, as a tool, emphasizes the importance of local participation in decision making and implementation processes. Besides, local participation is also necessary to find out psychological/subjective indicators for urban quality.

It is generally implied that the dynamics and rhythm of urban life decreases the life quality of citizens in many aspects. Contemporary urban lifestyles are fast paced and exhausting for many. Despite the fact that cities are the hearts of economic growth and cultural diversity, citizens might experience difficulties in enjoying the amenities of a city in context of time and space. During our busy daily schedule, mainly between work and home, we hardly find time to ourselves. When we have some spare time, we seek to enjoy what the city offers to us. On the other hand cities are densely built and populated environments which causes the feeling of “lost in space”. People want to access and circulate through their living environments easily. Furthermore they need places where they can escape the stressful rhythm of urban life. This is where landscape architecture takes the leading role; design of open and green spaces to provide livable and accessible outdoor environments, as well as to support urban ecology. Further benefits of urban landscape, that affects the urban life quality, will be explained in the next section.

## 2.2 The role of landscape architecture in urban design

Landscape architecture is the art and science of creating and conserving outdoor environments with respect to cultural values and ecological sustainability. It uses both non-living and living materials for design and planning, therefore the outcome is always dynamic and changing. Until recently, urban design was associated mainly with architecture and urban planning, and the role of landscape architecture was neglected. Landscape architects have been criticized for their urban design practices with low density, little formal sensibility, and too much open space which at the end look like suburban environments (Krieger, 2009). Today, on the contrary, urban landscape is considered crucial to creating sustainable urban environments. Although the word “landscape” is often used to describe natural and/or rural environments, there is certainly more to it. A landscape is shaped by both natural and cultural dynamics which also influence human life styles. Therefore an urban landscape is not only about green spaces within an urban environment. It is comprised of various land uses such as streets and squares, playgrounds, railway and canal corridors, cemeteries, bicycle and pedestrian paths, and waterfronts. Even structures in a city influence the urban landscape character.

Today urban environments have also a vast pressure on rural environments due to decentralization which causes loss of boundaries between urban and rural environments. Therefore it has a negative impact on natural resources which provide goods and energy for the urban dwellers. That is why sustainability has become the most important goal in urban design and planning more than ever. Urban design approaches should not neglect the natural processes which shape and influence the quality of life in urban environments. Since ecological principles are fundamental to landscape design and planning, urban landscape design plays an influential role in creating sustainable urban environments in context of resource management.

### 3. Urban landscape

Urban landscape is basically formed of open and green spaces within an urban environment<sup>3</sup>. However, it is not totally independent from the surrounding buildings and structures. Altogether, they form the character and identity of a city, and sense of place. It contributes to the cityscape by means of aesthetics and function. It also supports urban ecology. It is dynamic and constantly evolving. According to von Borcke (2003) *it is not an add-on but rather forms the basis for creating places*. Urban landscape elements function as separator and/or connector agents between different land uses. They can form a buffer zone between conflicting uses (e.g. between industrial and housing areas) while they can facilitate movement of citizens throughout the city (e.g. greenways). They have the flexibility to serve for multiple uses and for different group of users in the community (Anonymous, 2009).

Urban landscape also contributes to the cityscape in terms of visual quality. Within dense built environments, it creates a sense of openness and more attractive places to live. Urban landscape helps to balance human-scale in city centers where vertical effect of buildings and structures dominates. It softens the “hardness” of buildings and structures. Well designed and managed urban landscape can improve citizens’ quality of life in many other ways as well. The benefits of urban landscape are explained below.

#### *Ecological and environmental benefits*

Contemporary urban ecology assumes that urban areas are ecosystems since they have interacting biological and physical complexes (Cadenasso & Pickett, 2008). McHarg played a major role in emergence of ecological landscape design approaches in urban development. His work “Design with Nature” (1969) displays how nature and city might coexist together. However, ecology has been neglected in urban planning systems of most developing countries which mostly focus on the relationship between physical and socioeconomic aspects of an urban development. Urban green spaces are fundamental in sustaining the urban ecology. Some of the environmental and ecological benefits of the urban landscape are listed below:

- Urban green spaces provide flora and fauna with a habitat to live and therefore support biodiversity conservation.
- They also act as ecological corridors between urban, periurban and rural areas. They support movement of living organisms between these areas.

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<sup>3</sup> From now on “urban landscape” and “open and green spaces” will be used as synonyms in the chapter.

- Vegetation cover in urban landscape helps to improve micro-climate of urban areas where climate is warmer than their surroundings due to dense built environment and human activities. Vegetation cover raises humidity levels, reduces the stress of the heat island and mitigates the less desirable effects of urban climate (Landsberg, 1981). Daytime temperature in large parks was found to be 2-3°C lower than the surrounding streets (GreenSpace, 2010).
- Vegetation helps to decrease carbon emission levels in cities. Through photosynthesis process in plants CO<sub>2</sub> in the air is converted to O<sub>2</sub>. Therefore, urban vegetation cover helps to reduce excess CO<sub>2</sub> in the urban atmosphere. Although the degree of trees' drawing carbon emissions from the air is affected by their size, canopy cover, age and health, large trees can lower carbon emission in the atmosphere by 2-3% (GreenSpace, 2010).
- Vegetation cover also filters out other particles and dust in the air.
- Green spaces absorb and reduce the noise generated by human activities, especially trees act like noise barriers.
- Vegetation cover and soil in urban landscape controls water regime and reduces runoff, hence helps to prevent water floods by absorbing excess water.
- Trees can also act like wind breaker.

#### *Social benefits*

Humans are the dominating elements of an urban environment. Social interaction, as a basic need for humans, is essential in developing sense of community, belonging and security. Social interaction in cities is possibly the highest in public open and green spaces. Urban open and green spaces offer citizens various activity choices including recreational and sports activities which promote social cohesion. In 1992, researchers from Pennsylvania State University have conducted a nationwide study to investigate American public's perceptions of the benefits of local recreation and park services. They concluded that local parks and recreation services are linked to sense of community.

Furthermore people from different demographical backgrounds share public urban landscape in their everyday life. While today democracy is regarded as the only legitimate form of government throughout the world, urban open and green spaces possess the notion of democracy in their nature. These places are designed and serve to everyone in the community. On the other hand this raises the issues of accessibility, equity and participatory planning which will be discussed in the next section.

All people need leisure time for relaxation and self fulfillment. Especially people living in urban environments seem to be more stressed and need more leisure time for their physical and mental health. There is a strong relationship between lifestyles, physical environment and leisure (Oğuz & Çakıcı, 2010). Most people engage in leisure activities so that they can socialize. Urban open and green spaces can be designed to serve the community's leisure needs. It has also an economical aspect; for example playing ball games in a park or picnicking with friends is much cheaper than having a membership to a sports club or going to a restaurant. Unfortunately, nowadays people seem to spend more time indoors rather than outdoors which also leads to physical health problems due to inadequate physical activity. Designers should consider the ways to attract people to open and green spaces so that every group in the community can enjoy social benefits of urban landscape as well.

Environmental education can be regarded amongst the social benefits of urban landscapes. Green spaces can be thought of as outdoor laboratories to observe and get to know about nature. Environmental education is necessary for developing awareness and responsible behaviors towards the natural environment, especially for children. Although environmental education is integrated within the most school curricula, without physical interaction with natural environments it is not possible to develop environmentally responsible behaviors and attitudes (Çakıcı & Oğuz, 2010). Green spaces in urban landscape may play an important role in environmental education. For instance, botanical parks are where people can learn about different plants, their living conditions and observe the physiological changes during time. Even urban street trees present the seasonal physiological changes in plants. Green spaces are also found to have impact on reducing violent behaviors in urban environments. For example Sullivan and Kuo (1996) investigated the effects of plants on social behavior and concluded that urban forests can help to reduce domestic violence levels in cities (Jackson, 2003).

#### *Health benefits*

The degradation of natural environments inevitably affects human health in a negative way. According to World Health Organization (2012); *environmental hazards are responsible for as much as a quarter of the total burden of disease world-wide, and more than one-third of the burden among children.* The relationship between environment, particularly urban environments and human health is rather complex. There are too many environmental factors that influence human health. People are more likely to be exposed to pollution and infectious diseases in cities compared to natural environments. Besides, human behavior trends in urban environments facilitate microbial traffic (McMichael, 2000) and globalization expands the spread of epidemic diseases, mainly through global transportation of humans and goods. Moreover the changes in urban lifestyles lead to some serious health problems which decrease life quality. For instance, passive lifestyles of urbanized communities (i.e. low physical activity) are strongly linked to obesity which has become a major health problem throughout the world. Clinical studies have shown that there are many other serious health problems associated with obesity, such as diabetes (Mokdad et al., 2003), coronary heart disease (Flint et al., 2010), Alzheimer's disease (Profenno et al., 2010), reduced fertility (Brannian, 2011), depression (Luppino et al.2010), osteoporosis (Paula & Rosen, 2010) and cancer (Freedland et al., 2009). Likewise, stress, which is an inevitable outcome of fast paced urban lifestyles, is found to have an impact upon the immune, circulatory, and nervous systems (Esch et al., 2003). Moreover, urban citizens have less contact opportunities with nature which is also linked to health and well being.

Parks and gardens are where urban citizens can contact with nature in their daily life. Health benefits of being in contact with natural environments have been known for centuries. In his writings the Roman senator Pliny the Younger described the mental and physical therapeutic effects of exercising and spending time in his villa gardens (Bowe, 2004; Ward Thompson, 2005). In Europe, during the medieval ages, the cloister gardens of the monasteries were used as healing gardens where patients were treated, exercised and relaxed (Ulrich, 2002; Ward Thompson, 2005). However an urban environment contains too many stimuli which attract directed attention. According to Kaplan's Attention Restoration Theory (ART) (1995), intense directed attention causes mental fatigue and natural environments, where involuntary attention is attracted, help to recover from psychological

fatigue and allow directed attention mechanisms to rest (Berman et al., 2008). Even viewing natural environments is suggested to have positive impacts on health. Kaplan (2001) points out that nature views from windows influences well being and residential satisfaction (Oguz et al., 2010). Similarly, Ulrich (2002) suggested that viewing nature or garden landscapes can reduce stress and improve effects of clinical treatments in hospitals. Grahn and Stigsdotter's (2003) research also supports the idea that people, who spend more time in outdoor environments, are less affected by stress.

In the last century urban parks were referred as being "lungs of the city", which emphasizes their physical health benefits for urban citizens. As mentioned previously, urban vegetation cover provides a cleaner environment. Besides urban open and green spaces offer citizens' environments to exercise. The positive effects of physical activity on human health are well known. The regular physical activity is associated with reduced rates of coronary heart disease, diabetes, hypertension, osteoporosis, colon cancer and depression (Powell & Prat, 1996). Wolch et al. (2011) found that body mass index (BMI) in children with better access to urban parks is less likely to show a significant increase. In their study, Maas et al. (2006) investigated the relationship between the amount of green space in living environments and perceived general health. They found that the amount of green space has a positive effect on health although the causes remain unknown. They also suggested that green spaces should be given more importance in spatial planning policies. However, according to Lee and Maheswaran (2010) there is weak evidence between green space and both physical and mental health, instead factors such as quality and accessibility influence the use of green spaces for physical activity purposes. On the other hand Takano et al. (2002) concluded that longevity of urban senior citizens is positively influenced by living in areas with green spaces in walking distances. Sugiyama and Ward Thompson (2007) also suggested that outdoor environments have an important role in older people's well being.

There are many research on understanding and explaining the effects of urban landscape on human health. Although the links between health and green spaces remain missing, the literature review given above clearly display that urban landscape has positive impacts on improving both mental and physical health in several ways. It is landscape architect's role to create outdoor environments which maximize the benefits of urban landscapes for citizens to relax, exercise and restore.

#### *Economic benefits*

Although the economic valuation of urban landscape is difficult, open and green spaces have economic benefits in several ways:

- Their aesthetic contribution to cityscape influences property values. In general, urban landscape elements increase the nearby property value and enhance marketability of real estate (Anonymous, 2010). Accessibility, quality and visibility are basic factors that determine economic value of urban landscapes in this context.
- Urban landscapes provide employment opportunities during their design, construction and maintenance. The construction and maintenance of urban landscapes also supports other sectors such as playground manufacturers and nurseries.
- The health benefits of urban landscapes which were summarized above can reduce the costs of national health expenses.
- Public urban landscapes provide environments for walking, sports and other recreational activities for no cost at all, especially for lower income groups.

- Green spaces can help energy saving. Right selection and planting of plants can provide cooler environments in summer and warmer environments in winter thus reduce air conditioning expenses.
- Urban landscapes can enhance tourism in cities by attracting people. Park Güell in Barcelona, Spain is a perfect example of how a park can become a global tourism destination.

#### 4. Landscape design in urban environment

In this section landscape design is discussed in urban context. From a wider perspective, urban landscape is a part of urban matrix. Therefore design of urban landscapes should be considered as an integral part of urban design. Urban landscape design is clearly not urban design, but a crucial part of it. Hence, factors influencing urban design also influence the form and functioning of urban landscapes. It is advised that points stressed out in the previous heading "Urban design and urban life quality" should also be kept in mind while reading this section.

Design is a creative process influenced by designer's experiences, values, beliefs and vision. Hence it is mostly subjective, so is landscape design. Landscape design is the art of creating and designing aesthetic and functional outdoor environments. Because every landscape is unique, it is hard to define a universal guideline for design process. Nevertheless designing sustainable and liveable environments requires understanding of some basic principles which will guide the designer. Here, I will explain some of the principles which I believe are essential for urban landscape design.

##### *Adaptability and sustainability*

Urban landscape is as dynamic as urban life. It constantly changes. The design product is never finished due to both ever changing structure of urban realm and the living materials used in urban landscape design. Modern urban environments grow and expand so fast that efficient use of land becomes a necessity. Thus, any design should be capable of adaptation to changes through the time and space while maintaining identity. Adaptability and flexibility degree of a design product determines its lifetime. Therefore designing urban landscape requires a far-sighted approach. In landscape design adaptability can be achieved through selecting appropriate design elements (e.g. plants, water elements and construction material) that fit for site conditions (e.g. climate, soil and water resources) and creating multiuse or flexible outdoor facilities for activities for different groups in the community. On the other hand, if everything is designed to be flexible in order to achieve adaptability, then the design will fall apart without any sense of meaning or character. Hence some parts should be left permanent to provide a backbone for the design. Creating large open spaces is the easiest way to create flexibility in landscape design.

Adaptability is one of the key elements in achieving sustainability as it is about longevity. The concept of sustainability has been briefly explained in previous sections. Besides its strong relationship with life quality, ecological sustainability is fundamental to survival of all living organisms on the earth. Urban ecology, a relatively very new area of ecology, seeks to understand and explain ecological mechanisms within an urban environment. Embracing urban ecology in urban design and management is necessary to create sustainable environments. McHarg's outstanding work "Design with Nature" (1969) has triggered ecological perspective in landscape planning and design. His overlay method of site

analysis (suitability analysis) aims to define potentials and constraints of an environment for land use planning. Although he has been criticized for neglecting cities and social dimensions, he promoted integration of the natural processes into planning and design. The suitability analysis of McHarg still constitutes a basis for contemporary landscape planning and design. Assessing the relationships between each component of an environment enables designers and planners to recognize the true potential of a site for various land uses. Neglecting natural values in design causes high costs of construction and maintenance (Memlük, 2009).

Ecological sustainability is a tough yet crucial challenge in landscape design. It is often hard for the designer to integrate his artistic desires with the ecological facts. Yet, ecological mechanisms can help and guide the landscape architect through the design, because landscape design mostly depends on natural resources. In their study, Cadenasso and Pickett (2008) presented and discussed five urban ecology principles in context of urban landscape design. Table 1 shows the summary of their work.

<b>Principle</b>	<b>Principle basics</b>	<b>Design and practice implications</b>
Cities are ecosystems	Cities are ecosystems by virtue of having interacting biological and physical complexes. Urban ecosystems include four components: organisms, a physical setting and conditions, social structures, and the built environment.	Design affects all four components of human ecosystems.
Cities are heterogeneous	Heterogeneity in urban landscapes can be caused by both biophysical and social structures and processes. In turn, biophysical and social processes respond to urban spatial heterogeneity.	Design should enhance heterogeneity, and its ecological functions.
Cities are dynamic	Change in the structures and flows within cities, and between cities and other ecosystems lend a dynamic element to urban form and morphology (Decker et al. 2000; Kaika 2005; Shane 2005)	Design must accommodate internal and external changes projects can experience.
Human and natural processes interact in cities	All landscape designs and management schemes should be judged for their ability to contribute to both social and ecological goods and services, and to reduce both social and ecological risks and vulnerabilities (Steiner 2002; Grove et al. 2007).	Design should recognize and plan for feedbacks between social and natural processes.
Ecological processes remain important in cities	Concepts and approaches basic to ecological research can be applied to urban areas in an effort to understand how the city itself functions as an ecosystem (Alberti et al. 2003).	Remnant ecological processes yielding ecological services should be maintained or restored.

Table 1. Ecological principles and design applications (adapted from Cadenasso and Pickett, 2008).

Some strategies for ecologically sensitive urban landscape design are:

- Support and preserve biotic diversity and create habitat corridors.
- Minimize energy use and promote use of renewable energy resources. Reduce energy costs by using solar and wind energy systems.
- Protect and improve quality of water resources.
- Reduce water and fertilizer use by selecting native and drought tolerant plant species.
- Reduce water runoff by decreasing the amount of hard surfaces and proper drainage design.
- Conserve aquifer recharge zones.
- Provide collection and storage of rainwater in order to use it for maintenance of green spaces.
- Support pedestrian and bicycle circulation within the city. People should move easily and freely within a city. Cities should not be designed for vehicle traffic. Connected urban open and green space systems could create an environmentally and people friendly transportation routes.
- Choose plants suitable for local climate and site conditions. Selecting right plant species will increase the survival chance of plants in harsh urban environment, success of design and decrease maintenance costs.

#### *Coherence and legibility*

Coherence of a landscape refers to the organization of landscape components; it is the degree of consistency between the components. According to Salingaros (2000) geometrical assembly of elements determines the coherence of an urban environment and connectivity at all scales leads to coherence. He also stresses that coherence is essential for vital urban living environments. Coherence and legibility are strongly related to understanding of a place and feeling of safety. Thus, level of an environment's coherence affects its legibility by its users. More coherent and legible an environment is, more people make sense of it, and more they feel safe.

Legibility in urban design was introduced by Kevin Lynch in his work "Image of the City" (1960) where he analyzed post-war North American cities' built environments. Lynch defines legibility as "...the ease with which [a city's] parts may be recognized and can be organized into a coherent pattern". According to Lynch, legibility is a key basis for sense of place. A sense of place evokes the feeling of "belonging" which makes a place psychologically comfortable. For a designer, it is important to turn empty "space" into a "place" with a meaning to experience. Although place identity is different from sense of place, character and identity of a place are two main aspects of sense of place. Therefore, giving character and identity to a designed place is essential for creating meaningful places for people. Antrop (2005b) states that coherence of particular properties defines identity and changes in coherence causes loss of identity or transforms the identity to a new one. According to Relph (1976) physical setting, activities and the meanings are three basic elements of place identity (in Turner & Turner, 2006). The degree of coherence of the first two components influence the meaning interpreted by the user, and as a result sense of place. Sense of place is unique to both individual and place since it results from the interaction of both. Turner and Turner (2006) identified the components of sense of place as:

- The physical characteristics of the environment,
- The affect and meanings including memories and associations, as well as connotations and denotations;
- The activities afforded by the place,
- The social interactions associated with the place.

Loss of identity and character in modern urban environments is one of the main challenges for designers today. Furthermore it causes loss of community attachment and community identity. Changes in land-use, globalization, decentralization, environmental pollution and changing socioeconomic structure are amongst the reasons for the loss of identity and character. Hence, solutions need to be developed first at planning scale. On the other hand, urban design can help with renewing and creating places with coherence, character and meaning.

As summarized above, the concepts of coherence and legibility are strongly linked to identity, character and sense of place. Therefore coherence and legibility should be adopted as important design principles in urban landscape design in order to create meaningful places which people enjoy to experience. Some key points in enhancing coherence and legibility in urban landscape design are given below;

- Coherence of landscape elements might be visual, functional or ecological. Hence, both natural and cultural landscape elements should be assessed in terms of coherence.
- Both history and cultural values of a place should be considered in attempt to achieve coherence and strengthening identity.
- Local architectural styles and materials should be taken into account in landscape design in order to provide integrity and coherence and preserve local identity.
- Visual quality of a landscape is important for reading and understanding the place. The entrances and exits of a place should be visually clear.
- Placing sculptures or other ornamental features can enhance the visual quality of the environment.
- Human scale is essential in legibility.
- Landscape construction materials should be selected to support or enhance visual coherence overall and between different landscape elements.
- Designed environments should support perceived safety. Open spaces offer people a sense of security since they have a wider perspective of a place to see what is going on around them, however people also needs to find a “niche” for themselves to have some privacy or to hide if they feel insecure.
- Spatial definition also helps people to feel more secure. Knowing boundaries increases confidence. Hence, edges should be clear and visible.
- For ecological coherence, green networks throughout and around the city should be created and connected to each other.
- Time is another variable of coherence. Forms, textures and colors of an urban landscape vary through time. Therefore changes through time and alternatives for the future should be taken into account in design process.
- Coherence between user needs and expectations, and proposed activities should be evaluated. Participation of local people in design process may help to create more coherent design alternatives.

- Diversity is essential for both healthy functional landscapes and creating more appealing environments for people. Diversity of landscape elements without coherence may cause chaos.
- Connectivity between different landscape elements enhances coherence.

#### *Equity and accessibility*

Urban environments are where people from various ethical, social, cultural, economic backgrounds, ages and gender live together. Segregation of urban communities leads to both spatially and socially divided urban environments. As a result, equity becomes an important issue in achieving sustainable community development. Thus, designing public spaces for everyone is crucial in today's communities for developing community identity and preventing social fragmentation. Urban landscape design helps to create accessible environments for everyone in the community in terms of public open space. Public open spaces are places where people from different backgrounds get together and experience the urban environment equally in democratic communities. Thus, the activities and opportunities offered in these places should serve the needs and expectations of different groups in the community. Open and green spaces should be distributed evenly throughout the city. Special design techniques are needed to be taken into account for accessibility of disadvantaged groups, such as disabled and elderly. Not only the activities but also the landscape material should be selected appropriately to ensure easy accessibility and safety. Children should also be amongst priority in landscape design. Encouraging children to spend their free time in urban open and green spaces is a completely different research area itself. It is an interdisciplinary subject involving many dimensions from child development to landscape design. On the other hand, there is a clear need for promoting children living in urban environments to get involved in outdoor activities for healthier lifestyles as well as developing sense of community. Therefore, urban landscape design should give importance to creating safe, enjoyable and creative environments for children, and of course for their parents where they feel safe to let their children out.

Urban open and green spaces offer a unique opportunity for integration of different social groups and individuals. Hence, designers should seek ways to support social cohesion through space. Community involvement in planning and design schemes is necessary in order to have an idea of existing problems, needs, and expectations of different groups within the community.

#### *Community involvement*

Community involvement in urban planning and environmental impact assessment has gained widespread recognition in the last few decades. In urban design, community participation takes place mostly during decision making process in urban renewal projects. Involvement of community in design process increases their confidence in the project and their responsibility. Through information and knowledge exchange both local community and designers can be inspired. As a result, local community is more likely to support the project and to embrace the designed environment. This leads to satisfaction and long lasting use of the designed place. Therefore, community involvement should always be considered by the designer as an essential part of the design process.

We design outdoor environments for public benefit. Hence, understanding public opinions on their living environments could be helpful in creating livable urban environments. On the other hand, designers should realize that it is impossible to please everyone and respond to everyone's needs and expectations. Therefore, community involvement should only be accepted as a tool to understand the possible effects of design proposal on its future users.

#### *Cost*

Implementation and maintenance costs should be taken into account during design process. Cost efficient design strategies should be adopted in order to maintain durability and longevity of the designed environment. Urban open and green spaces can be designed and managed to minimize expenses. For example, stored rainwater in ponds and lakes could be used in irrigation, or use of fertilizers can be minimized by decreasing amount of lawn areas. Solar energy panels could be used to store energy during daytime which could be turned into electricity for lighting at night time. Multi-functional spaces also reduce cost by letting various activities take place in one place. Selection of durable paving material and site furniture will also decrease the maintenance costs in long term.

### **5. A case study - Cumhuriyet Square, Afyonkarahisar (Turkey)**

In this section a square design project, which was submitted to a national urban design competition in 2011, will be briefly explained. The proposed project has been designed by a multi disciplinary team involving landscape architects, architects and urban planners. The competition was opened by the Municipality of the province Afyonkarahisar which is located in central Anatolia, Turkey. The aim of the competition was to promote design solutions for revitalization of the square, namely Cumhuriyet Square, which has lost its identity and function due to surrounding densely built environment and vehicle traffic.

The square is located in the city center and surrounded with many historical structures which constitute a vital part of the city's identity. The city Afyonkarahisar has been home to many civilizations from the Hittite Empire to Phrygians, from Byzantines to Ottomans. Because it has a rich historical background, the built structures which have historical significance have been preserved in the design proposal. One of the biggest problems within the site is lack of open spaces. This also has a negative impact on pedestrian circulation within this historical site. Therefore, open spaces have been given importance in design process in order to promote pedestrian circulation and create a place for citizens to gather (Figure 1).

The existing urbanization pattern has caused loss of connectivity between focal features of the city. The design proposal has aimed to link the square to other key locations of the city, such as the Afyonkarahisar Castle, Ulucamii (a historical mosque), the train station, and the university campus (Figure 2a). Architectural restoration has been suggested between these landmarks to strengthen the historical identity. The roads surrounding the square are the main traffic routes in the city. This prevents integration of the square into the urban form, thus an underground passageway for vehicle traffic has been created in the proposed

design. Furthermore, all the historical streets have been pedestrianized (Figure 2b) and designed for easy accessibility.

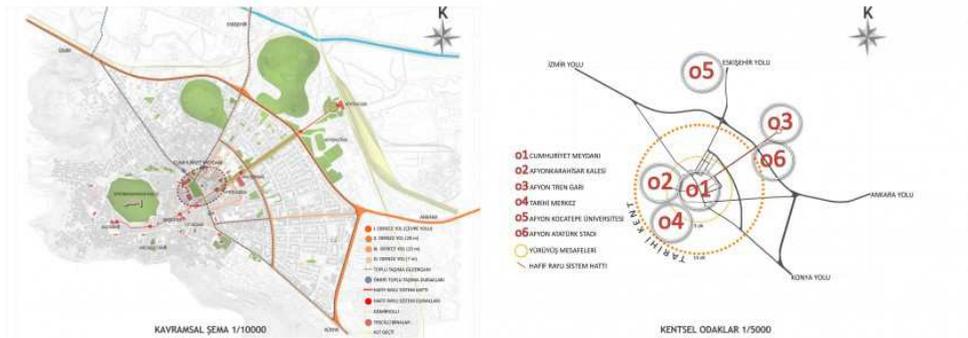


Fig. 1. The conceptual framework study.



Fig. 2. (a) Green network (b) Pedestrian areas

Due to its historical values, Afyonkarahisar is also a tourism destination. To provide accessibility to historical city center, parking areas and other serving facilities have been developed. Moreover, a cultural center has been designed by the square (Figure 3) and the city center is transformed into a historical and cultural asset for the city.



Fig. 3. The Cultural Center.

To conclude preserving the historical diversity and sustaining the coherence with the historical identity has been the main focus of the proposed design. The proposed design presents a clearly structured open space for multifunctional use which provides easy pedestrian movement and circulation throughout the historical city center (Figure 4&5).



Fig. 4. An overview of the proposed design.



Fig. 5. The proposed design for Cumhuriyet Square.

## 6. Conclusion

Urban landscapes are complex systems, shaped by continuously changing socioeconomic and political factors, as well as natural processes. In Turkey, like most developing countries they have mostly been perceived as the “left over” parts between buildings and structures in urban planning. However, as the rapid and uncontrollable urbanization process raises sustainability concerns at global scale, urban open and green spaces have become crucial elements of urban form. Urban landscapes are much more than “empty spaces”; besides they provide many benefits for the society. To summarize; urban landscape design supports not only ecological systems in urban environments but also provide the community with places to enjoy within the dense built environment. It also contributes to the identity of an urban area by creating visually legible and high quality places. Moreover, well designed urban open and green spaces might improve social cohesion and support sense of community.

The urban landscape involves two fundamental dimensions: physical and social. It is a difficult task to keep balance and respond to needs and priorities of these two dynamics. Hence designing urban landscape requires a comprehensive approach and a wide array of knowledge covering ecology, sociology, psychology and economics. Urban landscape is an integral part of urban matrix. Thus, the role of landscape architecture should not be neglected in urban design by planners and architects.

Landscape architecture integrates artistic design skills and ecological processes to create liveable and sustainable environments for community experience. There is a need for strengthening and emphasizing the role of landscape architecture in context of sustainable development by authorities. There is also a global need for development of an ethical approach in urban development which embraces natural values in planning and design for

the sake of human future. While debates over new urbanism vs. landscape urbanism remain in the agenda, I believe we will witness willingly cooperation of planning and design disciplines to create sustainable and quality urban environments in the next few decades.

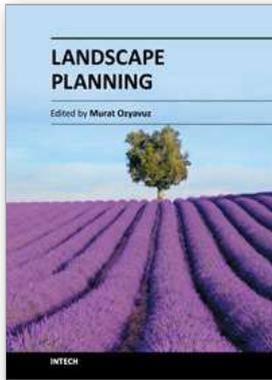
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Landscape architecture is the design of outdoor and public spaces to achieve environmental, socio-behavioral, and/or aesthetic outcomes. It involves the systematic investigation of existing social, ecological, and geological conditions and processes in the landscape, and the design of interventions that will produce the desired outcome. The scope of the profession includes: urban design; site planning; town or urban planning; environmental restoration; parks and recreation planning; visual resource management; green infrastructure planning and provision; and private estate and residence landscape master planning and design - all at varying scales of design, planning and management. This book contains chapters on recent developments in studies of landscape architecture. For this reason I believe the book would be useful to the relevant professional disciplines.

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