

LEARNING FROM THE PAST TO DEAL WITH FUTURE URBAN LANDSCAPE

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Abstract- The urban development and conservation of historic landscapes constitutes an important component in planning culturally rich settlements, under the cultural objectives which is inherent to be sustainable with the natural environment. In those cases, elements of both cultural and natural landscapes should have been given equal prominence in urban landscape design as both of them will be affected by different tendencies of modern development. The history of the contemporaneous city was influenced by the accumulation of different visions, different urban models under supreme thoughts, but many major disturbances over fragile landscape by the built forms in urban settlements have happened in modern and postmodern periods. Several countries now, face various problems produced by the processes of superposition of urban landscapes especially that happened during the modern period, which has been there in many decades. In recent years, urban development plans, inattentive to ecological and historical structures of landscape, have led to segregation of urban values. This research has investigated the historical and natural structure of Isfahan's urban landscape in Iran. According to the approved approach about urban landscapes evolution, connecting the natural setting with urban constructions especially in vicinity of historical areas increase the richness and desirability of the landscape.

Keywords: Urban Development, Historic Landscapes, Urban Values, Ecological Structures, Cultural Landscape.

I. INTRODUCTION: ISFAHAN, AS A GARDEN CITY DURING SAFAVID DYNASTY

Isfahan is located in the lush Zayandeh Roud plain between the foothills of the Zagros mountain range and Central Iran. This city has artifacts dating back to the Paleolithic period, and written history going back to ancient Aspadana. At a period Isfahan was among the largest cities in the world. It has twice been the capital city of Persia, during the Parthian Empire and the Safavid dynasty in sixteenth century. The travelers who visited Isfahan in the sixteenth century were astonished by the extent of its greenery and intensive garden complex. Indeed, the city seemed like a huge, smooth, green stain, crossed by a blue line -the river- in contrast to the make background of the desert [12].



Figure 1. Ecological structure of river in Isfahan city, Iran

Chardin (1666) States that Isfahan with its suburbs was the largest city in the world, resembling a forest from every direction; approaching the town, only the minarets and domes came to the eye [5]. Tavernier (1633) admits that Isfahan was same as Paris and the entire city structure was enveloped by green foliage [18, 15]. Pierre Loti, Pascal Coste and the other travelers confirm and mentioned the same accounts [12].

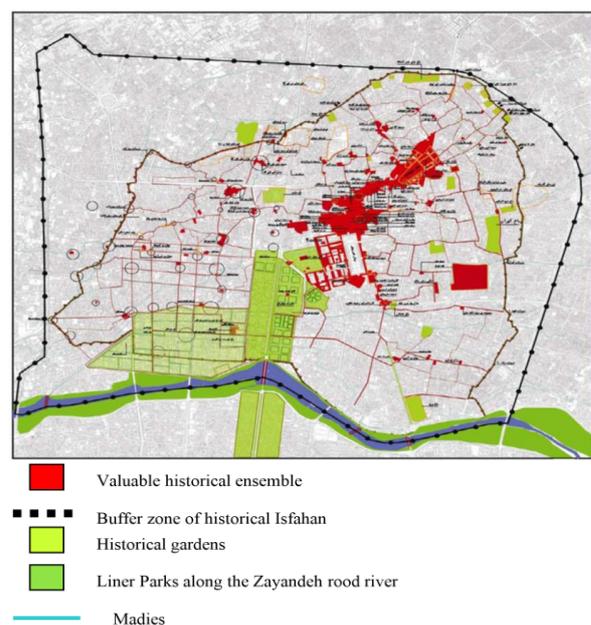


Figure 2. Remnant of historical gardens and constructions from Safavid period, [13]

In numerous, descriptions of the Persian cities in pre-Safavid accounts by various travelers and historian there is no reference of plants in the streets as well as in different sized fountains and wells served the water system of the town. In contrast every house had its own green space within the courtyards and the palaces were adorned with elaborate and extensive gardens. But these were enclosed and private, shut away from the public by the high, solid walls.

Under the Safavid, in sixteenth century, for the first time a planned, green area joined the compact mass of the old town to the Zayandeh Roud and its natural beauty. Consequently, the old Isfahan opened its arteries to its suburbs and gardens. The reasons for such modification in the town development can be found in both the political and cultural life of the city.

In short Isfahan was a garden city. The reason for such a miracle in the heart of the desert can be attributed to the Zayandeh Roud, the largest interior river in the Iranian plateau. An irrigation system (Madis) originating from the river dispersed water to all parts of the town and the ingenuity during Sasfavid dynasty [6].

II. ZAYANDEH ROUD: A PRINCIPAL AXIS OF URBAN PHYSICAL STRUCTURE OF ISFAHAN

Accessibility to the water resources had been of vital importance to the history of civilization and have been always one of the most crucial concerns of present cities for daily consumption and agriculture. This importance is more tangible and undeniable in the hot arid zones, where dependence of the people on water resources is undeniable.

The life of Isfahan, in the middle of the Iranian Plateau, is completely tied to the Zayande Roud River, as the main source of water. Comparing to its neighbor cities, the most important factor for the growth of this city, is the existence of this river system [7]. Its main source springs are located in southwest on the peak-forming Zagros Mountains forming two different hydrologic networks draining to southwest and northeast, where the latter passes through the city of Isfahan, and ends at the Gav-Khuni swamp.



Figure 3. General view of Zayandeh Roud River

The water distribution network in Isfahan is unique by several channels in different direction, transferring water

to all the districts of the city. Each of these channels, which are called Madi in Isfahan, branches off from the main stream of the Zayandeh Roud in its course before reaching to the city, and again it joins the river after traversing the city. There are many accounts of who and how has established these channels. Whatever, the patterns of human settlement in the city may had been considered, and influenced planning and forming these channel network.



Figure 4. Water channels named Madi

Water always has been the core of the urban structure in the hot-arid zones of Iran. Not only does it affect the city locations as a whole, but also exerts influence on the way different residential zones take shape and create interconnections within the cities. Comparing the residential system of city with an organic entity, the channel system can be recognized as veins and nerves systems of a human body. In the same way, Ardalan and Bakhtiar (1979) discuss: "Analogous to a leaf blade, the residential quarter is served by a disposition of 'veins' that sustain its tissue which, in return, regenerates the whole body".

This river acts as an effective axis on the growth of Isfahan that extended its limits towards the northern and southern banks of the Zayandeh Roud. The major axis of Chahar Bagh, built in the Safavid era, crossing with the river, over the marvelous Si-o-Se Pol Bridge. The intersection of these two axes of expansion creates "a Chahar Bagh on the macro level of the city, dividing it into quadrants and in effect transporting the garden's paradisiacal associations onto Isfahan, the city of paradise" [3]. The "combined historic cultural and - natural axis" of river are the main structures that have led the urban growth of Isfahan during its past four centuries. The first axis consists of the Bazar, Naqsh-e Jahan Square, Chahar Bagh Promenade, Si-o-se-pol Bridge, and Chahar Bagh Bala - which is the contemporary extension of the historic Chahar Bagh towards the south of Isfahan. The second yet natural axis is the Zayande Roud River, which traverse Isfahan (with the length of about 10 km inside the city) [4].

Several historic bridges constructed in different historical periods and modern time over this river inside the city zone. The historic site (result of two historic and natural axes in perpendicular shape) is the only remaining

work of an integrated planning and design scheme in the country's history that, in spite of mentioned negligence during the past three centuries, still possesses the potential of self-demonstration among the contemporary cities with its principal components that has monument buildings and spaces that was constituted in the past might individually loses due to fragmentation and discontinuity in the cultural and natural urban fabric of Isfahan [20].

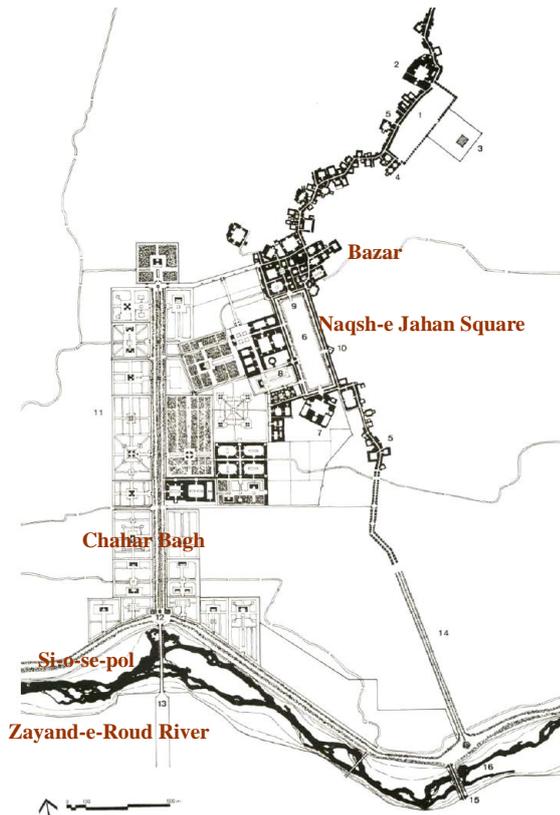


Figure 5. The central design structure of Isfahan's urban fabric; axes of Bazar, Chahar Bagh, Zayand-e-Roud River and gardens arrangement along the axis, [2]

III. FACING CONFLICT BETWEEN URBAN LANDSCAPE PLANNING AND PHYSICAL DEVELOPMENT OF THE PAST AND PRESENT DESIGN OF ISFAHAN

The city of Isfahan is the Iranian cities par excellence. During its hundred years of evolution, the city has become one of the most appreciated cities in the world. The roots of the city was traced back to at least two millennia ago, but it became the most important city of the country when it was chosen as the capital once in 11-12th century and again in 16-17th centuries. Particularly in the latter period, the city expanded enormously and its great old structure was complemented by massive new urban developments. These developments, which were in harmony with the older establishments of the city, transformed Isfahan to a unique Iranian city.

The city of Isfahan has been experienced two constant evolution since 2000 years ago. The first transformation started about 400 years ago during the Safavid period,

when the city was designated as the capital of Iran [7]. During this period, the city changed to a highly renowned city, combining the splendor of magnificent buildings with the greatness of functioning urban spaces and infrastructure. This type of quality and the vast scale of the city for that age attracted the admiration of any visitor and earned the city the reputation of half-of the world. The second development of this city occurred by modern structures since 1960s. The city has changed enormously by these radical initiations, in three comprehensive plans [6].

Nowadays, Isfahan is a, modern city, with valuable heritage landscape, enhanced conflicts between past and present. A major street network in favor of vehicular traffic has been the main intention behind all changes in the city.

The city is still confronted with master planning proposals, based on the wishes of the national and local planning authorities and urban designers rather than the true needs of the city. The historic fabric of the city is more and more invaded by construction of new transport network and manmade.



Figure 6. Historical fabric is changed with new construction

New constructions in historic areas, on the north of the river, is still under debate, due to people and local authorities' objections. Evaluating of new development needs overall dynamics investigating of the city.

The interface conflict between developmental dynamics and urban landscape of Isfahan city has been attempted to address under three stages:

- the landscape features of the 1st development ;
- the effects of the modern decisions and towards development plans;
- the new transport system in historic parts .

In the Safavid period there were two major axes of development: 1) the north-south axis named Chahar Bagh; and 2) the east-west axis alongside the Zayandeh Roud River and related Madis. The first axis shaped the built environment in Isfahan, and the second one provided the natural element and its influence on the urban life.

The results new development plans, is led to heritage destruction. Chahar Bagh Avenue has not damaged but the whole ancient structures such as Safavids gardens and palaces have been destroyed [15].

The cultural built forms discussed here has detailed out only its physical features only. Because most of these built forms were set over the land space by strictly following the Chahar Bagh design principals of Chahar Bagh pattern of Safavid urban design is discussed in the following sections under the natural landscape structure. Because it is a highly engineered ideas derived by the past designers by respecting the resource elements of the natural .i.e. water, vegetation and climate.

By the further developments of the city and during its contemporary urban renewals, the city borders reached and transcended the southern bank of the river. The Zayandeh Roud River has played a major role directing the urban strengthened as a principal structure of city development.

Before the modernity, Zayandeh Roud River was bordered the city, and had been never considered as a crucial element in the socio-spatial relations of the urban fabric of Isfahan. Isfahan was one of the several main cities of Iran that witnessed a huge growth during the Pahlavi period. In this era, the city developed toward its borders and defined a completely new scale. However, in the south part, the city reached to the south Mountain which stopped its further growth towards the south and southwest. Once south Mountain slopes were considered as suburban areas, nowadays, they define the southern border of Isfahan that is completely integrated to the city fabric.

IV. STRATEGIES FOR THE INTERFACE CONFLICT BETWEEN THE URBAN DEVELOPMENT AND LANDSCAPE OF THE PAST

Considering the fact that urban cultural landscapes are combinations of history and nature and also that in the course of time they change or sometimes ruin; therefore, the conservation of urban cultural landscapes should give them a new lease of life. Human's interaction in the bed of environment, has formed human settlements into biological complexes. These settlements have often created the cities. Some of these important settlements have undergone many natural incidents such as earthquakes, floods, etc. or human-caused events like wars.

In the historical city of Isfahan, an intertwined natural system, a ceaseless and solid connection between the Zayandeh Roud River and the structure of the city has been built since old ages. In this connected system which has been made in the time of the formation of the first biological cores since 2000 years ago, human's attention to natural environment and its potentials is conspicuous. Considering the importance of water for survival, people of that times, built their first biological complexes near the Zayandeh Roud River [1].

The river with a general direction of east to west and the main axis of Chahar Bagh with a north to south direction, create the basis of this urban system design. The design of the main avenue buildings and secondary axes in the form of checkered network as in Iranian Garden's structure has been the basis of his thought. Many gardens have been built along this network and

these gardens like royal palace-gardens have had both fruit and decorative trees. The design of fountains and water axes which have branched from the river and have been connected together by means of the wonderful system of the Madis is an ecological design devised hundred years ago.

What have remained from this system and the intertwined ecological structure are a number of important historical gardens. The Chahar Bagh area despite the protection of the Municipality and the Cultural Heritage Organization has undergone many changes and even in some part some destruction. This north-to-south direction which in the Safavid era, by passing across the river (Si-o-se Pol Bridge) and elongating to the mountains in the south of Isfahan , reached Hezar Jarib Garden , and had a significant role in Isfahan city's formation, plays an important role in Isfahan's development. A comprehensive development of green spaces as shown in the Fig. 6 was the proposed plan of past planners during Safavid period [8].

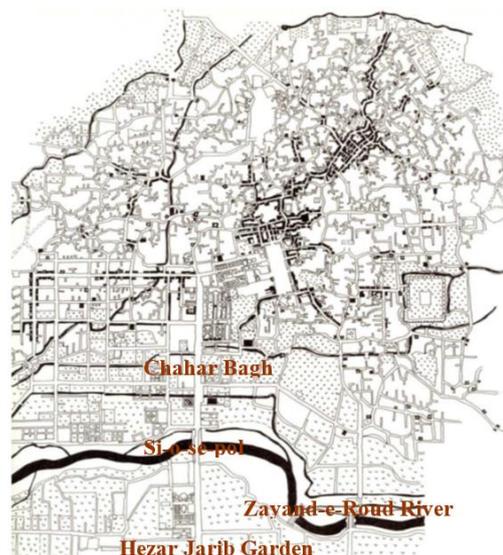


Figure 7. Isfahan's old fabric. This map shows the city of Isfahan in 1919, before being cut through by new straight streets during modernization plans. The old fabric of different neighborhoods, as well as Chahar Bagh structure, which was flanked by the royal gardens, were completely changed after the implementation of renewal plans, [4]

In the years, Municipality's policies of Isfahan for proportion of development plans and master plan has been aimed at conservation of this area and the parallel axes. Also, the Municipality has tried to take the general form of the garden-constructions into consideration in forming the development of the city. But the garden reconstruction must follow the old pattern as shown in Figure 7 to reflect the past landscape culture [8, 9].

Furthermore, the perseverance of the river's natural structure and its buffer zone has been of importance. The development of green areas along the river has been done to prevent construction in the proximity of the river.

Unfortunately, the development of constructions and new avenues has destructed many of Madis and streams. Today, there are only seven Madis left in Isfahan. Also,

drought phenomenon in Iran and its intense changes in climate have caused the decrease in precipitation and underground water resources and also it has abated the feeding resources of the Zayandeh Roud River's water (Koohrang Bakhtiari Mountains). Thus in snowfall and winter, the dams on upper parts of the river which fulfill Isfahan's water, are closed and the stream were cut. The river becomes a dry and remains so until the next spring.

The destruction of the Madis has been controlled in the previous decades. Currently, there are special rules and laws for their protection. In some areas of the city, in order to protect the old trees near the Madis, the Municipality pours water into Madis with special machines which keeps this ecological system alive. Since it is a costly solution, the old system of continues green ways along Modis must be reintroduced.

The urban historic landscape is protected by the conservation and restoring programs of the Cultural Heritage Organization. Often for these historical buildings, conservation zones have been considered and specific rules are determined. Some important rules which require following for the future development are as follows:

1. Construction or developments of any permanent built form near historical complexes are prohibited.
2. Constructing new avenues or widening the existent avenues is prohibited.
3. The Cultural Heritage Organization should buy and frees the incompatible function of buildings in the historical zone.
4. The Cultural Heritage Organization should supervise the development and land use plans of the Municipality in the areas connected to the zone with respect to the state and nation law of conservation.
5. Building new high constructions in the identified cultural landscape zone is prohibited or allowed by defining a setback distances in proportion with the geometry mass and void of the built form. The development allowed must be in harmony with the adjacent cultural surrounding without harmony the natural landscape elements.
6. As there are many issues in Isfahan in relation to urban design and planning the Municipality, the Cultural Heritage Organization and other stake holders are constantly should be in interaction to protect the historical and ecological structures of the city under integrated approach.

V. MATERIAL AND METHODS FOR REHABILITATION THE EXISTING URBAN CULTURAL LANDSCAPE

Remedies are suggested for cultural landscape which are distributed by human interventions during modern period having considering the preceding discussions mentioned in the previous about the history and the nature of Isfahan and also noting the results of the analysis and studies on many issues related to urban landscape and developmental aspects of Isfahan, along with the guidelines of the universal experience and the rules related to historical cities in other countries, the

following strategies are suggested to preserve and reconstruct the existing cultural landscape of Isfahan which is disturbed by the human interventions are as follows:

The adjacent areas as historical built forms the neighboring position of historical which are developing or developed areas of Isfahan most often severe destructions have been made by new buildings.

The disharmony between the newly developed areas in the vicinity of the historical remains, have made the landscape twisted, asymmetric and unpleasant. In addition, this disharmony enters towards the historical area like a negative force and leaves its negative impacts on the neighboring areas of historical built forms and leads to the fragmentation of historical textures which are interconnected in nature [14, 22].

The development of tourism infrastructure in historical landscape area faces weak management plan. Hence unplanned way of creating the amenities for tourists brought damages to the historical landscapes. Weak urban planning, design and management laws resulted merging of historical areas with new urban developments and this has destroyed the cohesion of the landscape.

The elements of the cultural landscape are considered and protected as separate units and hence there is no cohesion reflection among them. The following proposed strategies will offer the conservation and rehabilitation of cultural landscapes in urban areas:

1. It is necessary that the historical area of Isfahan be studied under the comprehensive dimensions of historical-cultural complex and by considering the historical and natural cohesion among its elements such as historical buildings, gardens, Madis, bridges ,etc. also conservation zone needs to be delineated.
2. The historical potentials in the city are not the sole historical core of Safavid era. It includes all ancient and historical cores of different rulers of the past. Areas of these kinds must have been planned under separate laws.
3. After delineating the zones of historical monuments and its limits, the visual landscape studies should be conducted all over the zone. In these zones new buildings must obey the height and density rules. It can never be possible to define a united fixed law for the whole zone and its adjacent areas. The laws related to cultural landscape conservation should be enforced according to the position of the area and its placement in the city texture. Although the whole historical and natural elements of landscape are considered as interconnected system, it is necessary to identify the identity of each element independently and the rules and regulations have to be decided properly.
4. For the interconnected urban landscape structures the managerial plan should be framed for the purpose of landscape conservation processes like rehabilitation, redevelopment and repairing of destructed parts according to the type and nature of damage.
5. In case of conservation of natural elements like Madis, Qannats, etc., as these elements and the components of their ecological landscape cannot be considered isolation,

it is necessary to study and conserve their sources and inter related elements. They feed from the river; the natural resource protection of river should be taken into consideration so that the Madis could survive.

6. Consideration of the ecological network of the gardens in Isfahan is important. Despite the destruction of many old gardens and fragmentations in natural context of the city, there should be scientific efforts to make out ecological connections between the gardens, rivers, and Madis in the city:

- Consolidation of the green ways along the urban routes (the highways, the streets and even the alleys in city quarters) is required to be integrated in the city designs.
 - Dredging the Madis, developing the green areas around the Madis, repairing the lining walls and re networking framework of the Madis and interconnection with the main network and to the ancillary networks of the Madis.
 - Developing the historical gardens towards each other along with other green ways by using the native plants of the region in implantation, by selecting the plants of different heights and categories from the low level plants (bushes) to high trees for making ecological corridors, conserving the old trees left over, creating identification cards for trees, cutting the dry and old trees and planting new ones, etc. have to be integrated with the planning and conservation processes.
 - Conserve the river zone by prohibiting the development of destructive constructions to the river landscape and controlling the health of the water by avoiding the sewage getting into the river and the nearby streams.
 - Preventing the morphological change of the earth by human interventions, in the form of excavation and embankment and flattening the hills or elevated areas is necessary. Because of their significant role in air streams in controlling the wind currents and wind motions in different parts of the city will get disturbed and also the hills' role in preventing the air pollution from spreading by wind currents are required to be considered in planning processes of urban development.
7. The relationship of people with the cultural system of the city by framing the policies for involving people for their cooperation support and participation for planning and designing developing, implementation etc. under urban landscape conservation processes.

VI. RESULTS AND DISCUSSIONS

Due to the development of historical cities and new constructions in the cities, historic urban landscape is destroyed. In most cases, the increase in constructions happen at the environs of the central historical texture of the city though the historical textures are important in case of identity and culture of the native people, and also they are remarkable for the people of the country as well.

In case of subcomponents of the historical fabric the following issues must be noted:

1. Comprehensive environmental studies should be done, both exclusively and inclusively, in order to determine the structural and architectural in relation to the other parts of the unit.

2. Data base of the documents and records of the past centuries writings and drawing of past landscape of each components of the urban landscape is necessary for reviewing to rehabilitation of the past landscapes compared to the modern and postmodern landscape to get a design control.

3. After determining the cause for the changes of landscape in course of time, the agents of destruction and change should be identified and according to that, the conservation plan for the current landscape and also plan for rehabilitation should be decided.

4. The designing of the urban landscape especially in common areas of the old and new landscapes, it is required to observe the following along with the repairing and conservation principles.

5. The structure of the old texture should be determined by using the padding system. The determination of the interlink among the components such as bazaar connection, alley, quarter, mosque and the royal district has a great importance in the formation of old landscape. Understanding these inter connections in offering a correct pattern of rehabilitation is very important.

6. Determining the combination of the buildings, the form and the shape of the building, the materials, the color, etc. important.

7. The height of the components beside together should be considered for designing. The skyline by understanding the viewer and the city image is important.

8. The harmony among texture, form, height, structure, color, and materials of the components in common areas of the old and new textures of the city is important to balance from proper observation and design.

9. The movement from the old texture towards the new one should be accompanied with the observation of the hierarchy and the connecting levels. The abrupt change from old landscape's form to the new will result the viewer's confuse. Thus, it is important to encourage this change be done gradually.

10. In addition to the harmony of the buildings' of the old texture of the new one, the balance between the old and new landscapes should also be completed by developing the green areas, especially with the native trees implantations.

11. The pavements routes are preferred to the motor ways. Creating the pavement with high trees and proper flooring of it with considering the harmony of the color and the form with the old texture can decrease the contrast between the old and new urban texture.

12. The stream of water in the creeks and the Madis nearby is very effective especially in bringing the harmony among the components.

13. Considering the fact that Isfahan is a garden-city and has the pattern of Persian Garden, in fragmented state needs a link between the new and old texture should be decided by planning the present Garden and creating the pattern of Persian Garden to establish the links.

VII. CONCLUSION

The contrast between modernity and cultural values had the most negative effect in historic parts of traditional Isfahan city, which gradually vanished as new developments influenced entire city. In this city, historic cores have already been destroyed, and have left great monuments isolated and surrounded by new development. But in spite all economic and social changes, the historic centers were so intrinsic to the national way of life that technological change could not afford to destroy them completely. They are still an alive part of the city and will always remain the cultural representative of our nation. In few words, what is missing the modern cities is spirit and cultural-ecological identity. The only way to give them the needed spirit and identity is to understand the realities about the historical city. These realities are cultural values and social way of life, which have shaped the traditional living environments in centuries.

Cultural values are qualities which are essential for building cities and sustaining them over time, but which urban civilization is unable to produce by it. Tradition means the chain of revealed truth, wisdom and knowledge, which is transmitted and renewed generation by generation, this linking various successive layers of temporal existence to the primordial reality which originated those [10, 11, 16, 21]. Islamic religion covers a whole range of countries from Asia to Africa. And although these countries have the same religious roots, still are culturally different. Cultural values are the only principles, which differentiated societies from each other.

Therefore, in order to gain a suitable adaptation of modernization to cultural values, each society should define concept of modernity for itself. But defining modernity with respect to the cultural identity should not renounce the benefits of modern technology. Innovations are so important in order to absorb and to integrate them into a meaningful cultural system. This will question the role of urban designer and planner in using their knowledge and wisdom in urban design approach. In last half of the century some innovating architects and planners through their architectural work tried to prove the possibility of considering the traditional design principles in providing appropriate and affordable shelters in modern design context [17, 19].

Historic cities of each country are open books to learn from. In fact they are an integral reflection of man's innate aspirations. To learn from the past necessitate the respect and understanding the philosophy hidden in muddled structure of historic cities [19].

The revitalization of the spatial and architectural quality of this structure is a necessary aid in learning how to form the future cities. Since transformation of European modernization concept to eastern countries, economic justification about urban development has been a deliberate attempt to separate culture from development. Consequently, in modern concept of urban planning, rehabilitation of historic areas has always relied on economic justifications. But in order to achieve appropriate design strategies, the gap between planning and conservation disciplines should be reduced.

Learning from the past should accompany the fact that what we can learn from the past are urban design values, perceiving the quality of form and spaces, but it is not something to be directly transformed into new design system. One should be able to take space organization and principles in a modernized expression of past forms. Choosing appropriate strategies in design of modern urban area will avoid the risk of superficial transfers or dependency of foreign ideologies and eventually generate a meaningful new system of cultural references. Rehabilitation of historic cities is an attempt to keep alive values, which are not measurable with the instruments of quantitatively, oriented modern civilization, but which are essential for people's spiritual emotional and physical welfare.

To link past to present and future doesn't mean to copy the old urban design principles and elements and create new environments without understanding the values hidden in these design principles. One shouldn't learn just to imitate it which it won't have any value. One should touch each principle, understand it, and learn how it is possible to adjust it in modern urban planning system. Within the historic town are the attitudes and activities that connect people and their environment in a world of changing values, economies and social distinction not just the form and physical structure. The conservation of such heritage areas need to be based on an erudite and philosophical understanding of the relevant human interests within the specific geographical and social context and not merely on maintaining the fabric.

Therefore, an effective urban design strategy is required through a systematic urban landscape by guarding the historical textures of the city along with a guided development of Isfahan city.

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