Environment as a Pattern for Design.
Case study: Shandiz valley in Mashhad - Iran

¹Rahman Tafahomi, ²Hasanuddinn Lamit

¹Department of Architecture, Faculty of Built Environment, University Technology Malaysia
²Department of Landscape Architecture, Faculty of Built Environment, University Technology Malaysia

ABSTRACT: The aim of this paper is to review the created problems and failure of environmental design patterns in designing process by designers. Not respectfully addressing the context of environment during designing process have resulted in the loss quality of environment, damage to both nature and essence of environment as manifested in the case study area. Methodology of the research was based on the qualitative methods, which includes content analysis (aerial photos, maps), observation of the environment, and documentation. Building styles and the general build environment were analyzed in both traditional and new forms styles. Findings of research have identified that the rate of morphological and geomorphology changes is relatively fast which physically resulted in the lost of the natural terrain forms. This process has also impacted the view and vista of the area and the beauty of the place. New forms of housing and villas have been built according to marketing demands although they may be in harmony and in congruence with the traditional form of housing and also character of the existing environment. Conclusions of the research go toward establishing elements and components of the build environment as a basic for creating design guideline in designing the environment, which in this instance should be to produce a coherent and in connectivity with the environment via design. This guideline include these issues: (a) form of building, (b) materials, (c) position and location of placement, (d) density and massing, (e) land form and harmony with context, and (f) composition.

Keywords: *natural design pattern, morphology, topography, architectural style*

INTRODUCTION

In processes of cities evolution, it is recognizable that there are numerous forms in spatial and textural qualities of cities (Morise, 1985). Nature as context of city forming have had important role in morphology of cities and occasionally natural forms has become significant attribute of region. Experts and scholars mentioned that both of the morphology and topography of cities with the influences of the climate have the most affected on the form of cities (Benevello, 1980; Morise, 1979). Some studies have also emphasize that the form of built environment follow of ethnic and family relationship between the inhabitants and demonstrate also the influences of these affectivies of the physical forms of environment (Abdullah, 1995). In Iran, some places, such as Abyaneh could still have their environment values and traditional forms be saved (CHTO, 2005), while other places have theirs totally destroyed as evident Delaman, Gonabad, and Torghabe (Baftshar, 2003; Tafahomi, 2005). Shandiz city is one of historical settlement in hillside of Binallod Mountains and region of Mashhad. Studies of the regional plan, noted that Shandiz has been affected by Mashhad as a metropolitan city due to their regional proximity and constant economic and social interactions between them. Shandiz city has been attracting for neighboring settlements as a recreational hillside city. Early tourism began with the out-of-town trips and spending leisure time, but has now changed into an activity of buying lands and properties with the general aim of building villas and private buildings. Nowadays, the process of built environment has transformed this place from a natural form to an artificial form. Effective factors that have been transforming the city are multi-aspects which, according to references can be classified into eight categories include environmental problems, tourism-recreational, architectural-view, economical, socio-cultural, management and administrational, and infrastructure (Baftshar, 2003; Farnahad, 2005). However, in this paper discuss on the visual and architectural aspects and those challenge with nature.

Issue

Specific issues that will discuss in this paper include of visual appropriates and architectural aspects of the city. These two categories include some details in following table:

Now, the city is gradually to losing all the physical charms

Table 1:Attributes of problems of Shandiz city Source: with adaptation of Baftshar, 2003; Farnahad, 2005

Aspects	Description
Visual appropriates	Unsympathetic to natural form of lands and relationship of hill and valley by transformation into terraces. Lack of a clear statement about building environment and buildings according to traditional and cultural aspects Destruction public space Limitation permeability into areas with built walls and fences Disregard for perspective and view of horizon
Architectural	No regard for the local and traditional architectural styles and copy of patterns of other places No concern for natural context and color Not addressing the concept of the integrating buildings and vegetation.

of a hillside city with special character and identity, although studies emphasized that the form of a city and urban open spaces might accommodate with attitudes of nature and sustainability (Thompson, 2002). New form of built environment cannot create a new character and in the many parts of city do not appear to any more different than some other parts of the metropolitan city. Currently, those wanting to build a villa or house in this part of the city are doing so without careful consideration to the area's specific character or attributes. Lang (1987) wrote that deign involves the processes of divergent and convergent thinking; evaluation consists of the application of values; and the making of decisions. These processes occur repeatedly throughout design practices. In addition, analytical processes, at any phase of design practices, involve breaking an entity or a problem into components and perceiving order among them. It is notable that, the projects of developers stopped in the divergent stage. At this instant, these projects are a carbon copy of other projects from other parts of the country. In a more worse scenario where recently there is a trend of copying of costal architectural style which comes in the form of beach style design and use of bright colors in this area. Some parts of Shandiz city now are losing qualities of livable environment. For example, Smith, Nelischer, and Perkins (1997) in reference to quality of the community recognized six principal categories: livability, character, connection, mobility, personal freedom, and diversity. These qualities have relationship with urban environment and physical form such as walk able community, outdoor amenities, lots of seating, barrier free and open spaces area in residential area. Features of most landscapes are increasingly being determined by human activities because; these activities modify existing landscape patterns and process either deliberately or inadvertently. Experts and professionals are now involving to create the justified connections between patterns and processes of changing view and vista of environment although this attempt is so slowly. This involves active efforts to produce a truly integrated science, the development of sound landscape design principles and increased interaction with policy, planning and management (Hobbs, 1997).

Environment Pattern and Sustainability Principles

Attributes and patterns of local design are now the indicators of sustainability in more of societies and places. Lang (1987) as a definition of the natural environment theory as a part of substantive theory writes that this theory deals with the physical, chemical, and geological nature of the surrounding of people and other organism. Its goal is to describe and explain the nature of materials, the nature of geometry, the nature of the interplay between nature forces and the artificial environment. The purpose for the development of this aspect of positive theory is to provide the knowledge base for understanding how the environment can be structured in different ways and how the physical nature of these structures interacts with other aspects of the natural environment. In many countries, there are special guidelines and standards for natural design, sustainability, and emphasizing on region. For example, in the section of design, in the Planning Policy Statement 1, it also mentioned that good design should:
- be integrated into the existing urban form and the natural and built environments,
- Be an integral part of the processes for ensuring successful, safe and inclusive villages, town and cities;
- Create an environment where everyone can access and benefit from the full range of opportunities available members of society; and,
- Consider the direct and indirect impact on the natural environment (PPS1)
Some policy statements in the case of UK also emphasized on the concept of natural design as an indicator of sustainability. For example, Carmona et al, (2003) addressed all environmental aspect of design and were presented in a very skillful designed table, which shows relation between the environmental design issues at various spatial scales. Carmona classified environmental issues into 10 row titles include (1) Stewardship, (2) Resource Efficiency, (3) Diversity and Choice, (4) Human Needs, (5) Resilience, (6) Pollution Reduction, (7) Concentration, (8) Distinctiveness, (9) Biotic Support, (10) Self-sufficiency. Each one of the row categories embraces four aspects of the row titles

includes (a) Building, (b) Space, (c) Quarters, (d) Settlements.

Natural Patterns of Shandiz Area

The natural patterns of Shandiz area can be classified into two four categories include Topography patterns, Morphology patterns, Architectural patterns, and Visual patterns although there are other classification as well (Carmona et al, 2003; UDA, 2003; Baftshar, 2003; Farnahad, 2005).

1. Topography patterns:

Normally traditional and historical cities have respected to their topography as a context and it is evident that topography of earth have been well respected among the various ethnics and culture. This explains why more temples and pantheons were built on the top position of hills (Bacon, 1967). Significant attributes of topography helped in creating numerous forms and townscape in cities. For example, in traditional and historic cities, form of cities follows the topography according of terrains. It is noticeable that topography have not seriously been a limitation for development and built environment although have created problems in fast and easy development. This natural specification, create a visual enhancement in many more places of this kind such as Masole in north of Iran and Abyane in Center of Iran. Four components have had major impact in the topography, which include hills, valleys, rivers and waterfronts. We can account numerous cities in the world that followed these terrain traces. In Shandiz, three of these components such as hills, valleys, and rivers are highlighted. Composition of these three elements creates a great view and vista.

2. Morphology patterns

Human interventions in built environment have affected on the forms and morphology of cities, nature, and surrounding area (Benevello, 1980), and the environment conditions have allowed people put their mark in nature (Bentley et al, 2003). Morphology of a city and especially urban environments can be classified into two kinds: natural and artificial. Natural parts include trees, gardens, river landform, and backdrops of hills and mountains, and the artificial parts includes aspects of forms of housing and buildings, paths and roads, and finally walls and fences. Morphology of Shandiz was based a linear form on hillside and close to a river and that it is this river play role as a boundary statement. Hence, this particular form for Shandiz was derived by a conglomeration of the artificial of built environment with the topography and also expansion of city along the river and the crest of hillsides of Benalod Mountain. It can therefore be noted that the form of city follows a linear direction between two main elements of nature: the river and hillcrests. Districts of the city established around the main street. Shandiz have three old districts include Mahale, Paein Deh, Pachenar. The city was also established as gardens between spaces which created a magnificent urban fabric.

3. Architectural patterns

Architectural patterns of buildings in Shandiz have special forms that respond to the patterns of topology and climate. In the main, sunlight is one the important factors in designing a building as it determines the direction of housing. Furthermore, forms of windows in buildings follow the vertical rectangle angle according to its geographical length although other forms of widows can be seen. The buildings were mainly oriented toward of light despite the fact that the façade were not main frontage. Forms of housing in the districts have been mainly influenced by the location or the placement and position on site. Positions of building follow the location of placement such as hillside, valley, and rivers. In the form of buildings, gardens and trees encompass these kinds of house as well as providing security and privacy for family members. In this part of districts, city's fabric is formed via walls of gardens. These garden's walls formed common or share partitions between the houses, on empty land, or along footpaths. In these kinds of garden houses, to build new buildings in garden area was common, and with new generations of the same family building new houses in close proximity to the main house. However, this form extended houses and gardens have reduced the quality and volume of light coming into the interiors as the houses are usually formed surrounding small courtyards. However, the courtyard layout has also seen that activities are common between family members of each household which also encourages social interaction. Excellent

4. Visual patterns

Lynch (1960), Cullen (1971), Krier (1979), Hedman and jaszewski (1984), Moughtin (2003), Broadbent (1990), and Lamit (2004) have different classifications for visual qualities. Some of emphasize on the landmarks role in morphological structure and visual elements of a city (Lynch, 1960; Hedman and Jaszewski, 1984; Krier, 1979; Lamit, 2004). Cullen (1971), Broadbent (1990), Moughtin (2003) relate the psychological aspects of visual elements in the context of civilians qualities life. However, according to definition of visual elements, the urban environment can be classified in two major groups. Firstly, the "Scapes" group that is based on a long shot perspective of urban environment includes townscape, landscape, streetscape, vista, background, and backdrop. The second is 'View's group that is based on the short shot views of city include façade, frontage. Visual patterns of the Shandiz comprise of both "Scapes" and "Views". The surrounding background of the city in concert with the townscape has created a very evocative vision man-made environment and nature, with magnificent views and vistas. Furthermore, the short views between the lines of city also have created very nice sense of places.

5. Who Design this Area?

The common people have the ability to design their environment and housing domains. Making decisions about the future is characteristic of many human endeavors. People

have been designing structures and buildings to fulfill present and future needs since prehistoric times. They have used some design process to achieve the results they seek (Lang, 1987). Studies have shown that in much of the world today, design is a self-conscious process carried out by professionals (Alexander, 1964) and design process normally use by people and professionals even self-maker (Zeisel, 1986). Four groups currently influence on the condition of the built environment and designing process in Shandiz include (1) engineering, (2) property owners, (3)developers, (4) municipality actions.

Analysis the Aspects and their Effects on Nature

Impacts on the nature and sustainability of area via the actions of designers can be classified into two main groups include (1) Visual aspects of environment include topography of area, morphology of city, gardens, (2) Architectural aspects in the area include form of building, material, position and location of placement, density and massing, view, harmony, character, composition with plane.

Conclusion: Return to Natural Patterns as a Model of Development

The root of problems of Shandiz is in the speed of development and lack a management by those who apparently are not familiar with the sustainability concept and natural design as well. This is a common scenario among the many cities in Iran and rarely do we find cities, which have been developed or designed according to the aforementioned concept. However, despite the scale of the problems or the issues related to design of the cities, it is conceivable that with a little bit more thought and deliberation, the outcome can be one of site specific which manifests the genius loci of the area. According to analysis, the problems identified are in two major groups: visual aspects and architectural aspects. Major parts of this city were developed with very little or vague urban design guideline and not undertaken according to the specified objectives, principals, issues, and urban design aspects (DETR, 2000; MFE, 2006, 2007). As a conclusion, the major concept of natural patterns as a model of development can be shown in table 3.

Table 2: Analysis the action and effected issues on the area

Actions	Challenge of Area	Effected Issues Design
Visual Aspects a) topography	Surfacing natural forms of land Making terraces forms of hills and slopes	Lost the townscape and landscape character Destroy natural background and backdrop
b) morphology	Not respect to character of districts in city Built streets and buildings likes to metropolitan city Copy of Mashhad city morphology	Lost of identity of districts, streets
c) gardens	Destroy gardens to make building Destroy gardens for new design such as swimming pool,	Lost of character of streets and buildings Incompatible new form with city fabric Lost significant characteristic in the area Lost of green space
d) view	Close open spaces with walls Destroy natural interesting view	Decreasing the continuity of gardens and house garden Destroying the permeability Lost of public realms Decrease in open spaces Decrease in view and vista
Architectural Aspects a) form of buildings	Introduction of new style of buildings in the area Changing the directions of buildings Changing the form of housing garden into apartments	Lost the specific characteristic of buildings Decreasing the harmony of morphology Lost of most attractive points for tourists
b) materials	Introduction of the new material in the area Use of non-recyclable materials	Incompatibility between new materials and old forms of buildings
c) position/ location	Change position of house in land Changing methods of placement for housing and new districts	Decrease in harmony in morphology Defects in old districts during renovation process
d) density and massing	Increase number of new-districts and town in around the city Increase in the density of old districts of city	Appearance new districts around of the city without unity with city fabric
e) harmony	Change patterns of massing in city No regard for the concept of harmony housings, districts, and in the city	Decrease in harmony and unity in old districts Lost concept of districts and hierarchy between them
f) character g) composition with plane	Duplication of style of a metropolitan city No regard for the character of buildings No intention to create harmony within the in housing community.	Decrease in innovation in design Lost character of city Lost specific characteristic of housing as a natural buildings

Table 3: Natural patterns in design

Actions	Challenge of Area	Natural patterns in Design
Visual Aspects a) topography	Lost of the townscape and landscape qualities	Respecting the townscape via legalization to limit building along view corridors but according to topography of area
b) morphology	Destroying natural background and backdrop	Limiting the destruction to parts that of the environment that have view from the city as context and background
	Lost of identity of districts, streets	Application of natural elements and components to define identity in districts such as name of districts and historical trees as landmarks
	Lost of character of streets and buildings	Encouraging the specific form of streets of cities such as garden streets, twist of roads, slope
	Incompatible new form with city fabric	Use of local elements to link separate parts such as material, trees, and planes
c) gardens	Lost of significant characteristic in area	Legalization for gardens with the aim of encouraging policies to save gardens
	Lost green space	Attention to recognizing new opportunities Creating green partition to define sense of places Saving existing gardens with variety in land use,
	Decrease in the continuity of gardens and house garden	Legalizing application the soft, short, natural walls Build particular paths to direct access into the natural resource and open spaces and legalizing visual access into second layouts spaces
	Destruction of permeability	
d) view	Lost of public realms	Appreciating the concept of urban space and public realm in new design via revitalize neighborhood spaces, central space of districts and view toward them
	Reduction of open spaces	
	Reduction of view and vista	
Architectural Aspects a) form of buildings	Lost of the specific characteristic of buildings Decrease harmony of morphology Lost of most interesting point of tourists	Provide Buildings Standards Guideline to save the specific characteristic of buildings Create junctures between separating forms with respect to variety and harmony of morphology Design highlighted building in city as indicators for other buildings
b) materials	Incompatibility between new materials and old forms of buildings	Provide Buildings Standards Guideline of materials to save and create harmony between the old forms with new forms in city
c) position/ location	Decrease harmony in morphology Defection of old districts in renovation process in old districts	Use of harmonic patterns to create to sustainable patterns to place Encourage local and character patterns in new development Provide junctures and connection between city character and new places
d) density and massing	Appearance new districts around of city without unity with city fabric	Reconsider density concepts such as privacy, enclosure, neighborhood, shadow angle length
e) harmony	Decrease harmony and unity in old districts Lost concept of districts and hierarchy between them Lack of innovation in design	Due regards for views and background in design Avoid to intervention in city before of having proper plan approach Provide pathologic study for damaged parts of city Highlight the unique character in city and encourage to respect it
f) character	Lost character of city	Redefine character of city with monuments, elements, components in city
g) composition with plane	Lost of specific characteristic of housing in this place as a natural buildings	Legalization encouraging policies to save gardens and create green partition around building and sense of garden house

REFERENCES

1. Abdullah, M. S. (1995) Tribalism, Genealogy and the Development of Al-Alkhalaf: a traditional settlement in southwestern Saudi Arabia, Habitat International, Vol19, No4, Pages 547-570

2. Alexander, C. (1964) Notes on the Synthesis of Form, Cambridge, MA: Harvard University Press,

Bacon, E. N. (1967) Design of Cities, Thames and Hudson Ltd., UK

3. Asheville Planning Department, (2005) Hillside and Ridgetop Regulations: A Recommendation for Asheville, Planning Department, Australia

4. Baftshahr, Architecture and Urban Planning Consulting Company. (2003) Shandiz and Torghabe Tourism Strategic Plan, Local Government of Khorasan, Iran

5. Benevello, L. (1980) the History of the City, MIT Press, USA

6. Bentley, I. et al (2003) Responsive Environment: a Manual for Designers, Architectural Press, UK

7. Bowdoin Collage (2005) Building Design Standards for Renovation Projects, Bowdoin Collage Publisher, CA

8. Broadbent, G. (1990) Emerging Concepts in Urban Space Design, Van Nostrand Reinhold, Hong Kong

9. CHTO, Cultural Heritage and Tourism Organization of Iran (2005) Annual Report, Cultural Heritage and Tourism Organization, Iran

10. Cullen, G. (1961) Townscape, Architectural Press, London

11. Cullen, G. (1971) the Concise Townscape, Architectural Press, London

12. Farnahad, Architecture and Urban Planning Consulting Company. (2005) Regional Plan of Mashhad, Khorasan branch of Housing and Urban Development Ministry, Iran

13. Fuad-Luke (2003a) 'Slow Designing the Eco (r)evolution, Design, Vol 298, April 2003, Seoul, Korea

Google Image, Access in: www.image.google.com/image

14. Hedman, R., Jaszewski, A. (1984) Fundamentals of Urban Design, American Planning Association, Planner Press, Washington DC, USA

15. Hobbs, R. (1997) Future Landscape and the Future of Landscape Ecology, Landscape and Urban Planning Journal, Elsevier Science Ltd Publisher, Vol 37, Pages 1-9

16. Krier, R. (1979) Typology and Morphology Elements of the Concept of the Urban Space, Republish in Time Saver Standard for Urban Design (2003), McGraw-Hill Publisher, USA

17. Kumar, S. (2002) Canadian Urban Design Practice: a Review of Urban Design Regulations, Canadian Journal of Urban Design Research, Vol 11, Issue 2, Pages 239-263

18. Lamit, H. (2004) Redefining Landmarks, Alam Bina Journal, University Technology Malaysia, Vol 06, June, Malaysia, Pages 66-76

19. Lang, J. (1987) Creating Architectural Theory: the Role of the Behavioral Sciences in Environment Design, Van Nostrand Reinhold Company, New York

20. Lang, J. T. (1987) Creating Architecture Theory: the Role of the Behavioral Sciences in Environment Design, Van Nostrand Reinhold Company, Australia

21. Lynch, K. (1960) the Image of the City, MIT Press, Cambridge Mass, USA

22. Morgan, C. (2006) Design and Detailing for Airtightness: SEDA Design Guides for Scotland, SEDA, Scotland

23. Morgan, C., Stevenson, F. (2005) Design and Detailing for Deconstruction: SEDA Design Guides for Scotland, SEDA, Scotland

24. Morris, A. E. J. (1979) History of Urban Form, Publish by George Godwin Limited, USA

25. Moughtin, C. (2003) Urban Design: Street and Square, Architectural Press, Third Edition

26. Pittsburg, City Council. (2007) Pittsburg Hillside Development Regulation and Guidelines, Pittsburg Municipality

27. Simonds, J. O (1997) Landscape Architecture: A Manual in Site Planning and Design, McGrow-Hill Publisher, Hong Kong

28. Smith, T., Nelischer, M., Perkins, N. (1997) Quality of an Urban Community: a Framework for Understanding the relationship Between Quality and Physical Form, Landscape and Urban Planning journal, Elsevier Science Ltd Publisher, No 39, Pages 229-241

29. Tafahomi, R. (2005) Documentary of Historical and Cultural Heritage Parts of Gonabad City, Cultural Heritage and Tourism Organization of Khorasan Razavi, Iran

30. Thompson, C. W. (2002) urban Open Space in the 21st Century, Landscape and Urban Planning Journal, Elsevier Science Ltd Publisher, Vol 60, Pages 59-72

31. UDA (Urban Design Association) (2003) the Urban Design Handbook: Techniques and Working Method, Publisher by Courier Kendallville ink, USA

32. Zeisel, J. (1986) Inquiry by Design: Tools for Environment-Behavior Research, Cambridge University Press, USA

33. San Diego, (1997) San Diego Municipal Code, Land Development Code, San Diego Municipality, California, USA

34. Riverside country, (2005) Citrus Vineyards Policy Area, Draft publish, country of Riverside