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## Tacit Knowledge and Deep Ecology: A Hermeneutic Approach to the Concept of Tacit Environmental Knowledge in Landscape Architecture

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### Abstract

The art and knowledge of landscape architecture spans many disciplines, while landscape design in itself is an expression and treasury of cultural values and beliefs, natural and visual impacts. In the case of ecological and environmental paradigms and knowledge, the designed landscape faces particular challenges to environmental design quality and landscape identity. This threat is even more significant for a country like Iran with considerable ecological diversity and an ancient civilized culture. This paper addresses the potential contribution of both of Iranian tacit knowledge of landscaping and landscape ecology to manage, or at least help alleviate, some of these issues. The key questions are:

- What new challenges are there in landscape design related to landscape ecology?
  - What concepts and values can help us create a fit and beautiful landscape with environmental benefits, while making use of vernacular potentials?
  - How can various aspects of knowledge influence the way we design, construct and manage landscape and develop urban and rural landscapes architecture?
- In an effort to answer these questions, we hope to identify measures for appropriate choice of vegetation; appropriate grading; use of barriers; and the promotion of environmental archetypes, native methods and ecological patterns. In order to cover these delicate discussions, the author presents two main concepts *tacit environmental knowledge* and the *oasis paradigm*.

**Keywords:** deep ecology, tacit environmental knowledge, landscape ecology.

### اکولوژی ژرف‌نگر و دانش ضمنی: تاویل مفهوم «دانش ضمنی محیطی» در معماری منظر

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#### چکیده

دانش و هنر معماری منظر بعنوان یک میان رشته، واسطه بسیاری از حوزه های تخصصی است. با این وجود، در حالی که طراحی منظر (بعنوان شاخه ای از معماری منظر) بطور ذاتی بدنبال تبیین ارزشها و باورهای فرهنگی در ارتباط با جلوه های طبیعی و بصری است، شاهد مسایل زیادی در طراحی مناظر ایجاد شده هستیم. همچنین به رغم وجود توان بسیار زیاد در زمینه دانش و باور های محیطی و اکولوژیکی، در مناظر طرح شده، بویژه از نظر هویت منظر و کیفیت طراحی محیطی مشکلات بسیاری وجود دارد. این موضوع به ویژه در ارتباط با ایران به دلیل دارا بودن فرهنگ و تمدن کهن و نیز تنوع بوم شناختی قابل توجه است.

این مقاله تلاش می کند تا به معرفی و تبیین توان دانش ضمنی پردازش منظر در ایران و نیز بوم شناسی منظر در مدیریت و یا تعدیل بخشی از مسایل مطرح شده بپردازد. در این رابطه نیز پرسشهای اصلی به شرح زیر است:

- مسایل کنونی طراحی منظر در ارتباط با بوم شناسی منظر کدام است؟
  - چه مفاهیم و ارزشهای متکی به کاربرد توان های محلی و بومی می تواند به خلق و ایجاد منظر درخور، زیبا یا بهره های محیطی منجر شود؟
  - جنبه های گوناگون دانش منظر چگونه می تواند در روند طراحی، ساخت و مدیریت منظر و نیز توسعه معماری منظر شهری و روستایی موثر باشد؟
- در پاسخ به پرسشهای بالا و در راستای هدف (در زمینه های نظری و عملی)، امید زیادی به شناخت مفاهیم بوم گرایانه و یافتن گزینه های مناسب پوشش گیاهی، بسط سازی، کاربرد جداره ها و حائل های فیزیکی (به ویژه در مناطق گرم و خشک) و نهایتا ترویج کهن الگوهای محیطی، روشهای محلی و الگوهای بومی وجود دارد. در این رابطه نیز نگارنده برای بسط چنین مباحث حساسی، دو مفهوم اساسی "دانش ضمنی محیطی" و "الگوی واحه" را معرفی و پیشنهاد می کند.

واژه های کلیدی: بوم شناسی ژرف نگر، دانش ضمنی محیطی، الگوی واحه، بوم شناسی منظر

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## Introduction

Landscape architecture is normally defined as the art and science of modifying land and vegetation for increased pleasure and usefulness. With this broad definition, landscape architecture has a long history, which dates back to the dawn of civilization. The ancient Egyptians, Mesopotamians and Persians planned gardens and cultured landscapes date back to as early as 1500 BC, and the so-called 'hanging' or terraced gardens of Babylon or Persian Gardens are just as famous.

Nowadays the art and knowledge of landscape architecture spans across many disciplines and, though landscape design can be a focus, the work of architects, environmentalists, ecologists, land artists and environmental designers is often equally valid. Meanwhile Landscape design is an expression and treasure of cultural values and beliefs, natural and visual impacts.

In the case of ecological and environmental paradigms and knowledge, the designed landscape faces particular challenges. However, common issues of dryness, shortage of water, global warming as well as the need for sensitive treatment of environmental ethics and landscape quality are in a diseased state. Therefore, there is the need for a new vocabulary to

express a different philosophy of design and approach is very apparent in discussions of landscape architecture and ecological landscapes. Currently, and in Iran in particular, there is a lack of hermeneutics and a landscape design language that is both culturally meaningful and ecologically deep and healthy.

Various practitioners can ask questions in different situations such as policy makers at the national level, or urban planners when planning a new town development scheme. Academics might also review the role of their scientific contributions to ecological-environmental development. In the same spirit, landscape architects should also question their role as agents of development in their social responsibility and professional practice.

The research and the theoretical framework for the proposed *tacit environmental knowledge* has been developed from the theory of "Ecological Landscape Design" (Taghvaei, 2005), which identified four major concepts of ecologically-environmentally landscape design in arid zones based on oases:

- Labyrinth of holistic meaning;
- Image of landscape ecology;
- Miniature landscape; and
- Everyday landscape.



**Figure 1.** Cheshmeh Belgheis garden in Khozestan, is a good example of ancient Iranian culture, paradigms and landscaping. (Author's personal collection)

According to both the theory and research findings,<sup>1</sup> these four concepts describe the specific dimensions and image of the “oasis paradigm”, its “vernacular place” and its culture and the environmental knowledge of the people as “oasis-based knowledge” (Taghvaei, 2005).

Ecological Landscape Design, therefore, is a paradigm and a kind of deep environmental expression for changing non-environmental and vernacular thinking (especially for Iranian landscape architecture). As a framework, it can follow an environmental basis, tacit knowledge of real-life and future sustainability for landscape architecture and environmental design.

“Wherever we are, wherever we are awake, we are experiencing the landscape, from the city street to the remote wilderness. We perceive our surroundings using all our senses. We oriented ourselves by the pattern of the landscape and find pleasure or displeasure in it. Those patterns, and the landscape they comprise, are dynamics, not static. The process – geological, ecological or cultural – operates over varying time intervals ranging from millions of years to a few hours. Thus landscape is an amalgam of patterns, our perceptions and the processes that change both patterns and perceptions.” (Bell, 1999)

### **Landscape Ecology**

Landscape Ecology seeks new and innovative subjects that improve our understanding of the relationship between landscape patterns and ecological processes, and their consequences. Recent researches and studies show us one of the significant shifts in the theoretical orientation of discipline over the past decades has been the development of concepts of ecological and environmental design or landscape.

“This in turn has raised questions about the aesthetic basis for ecological design. In particular, there has been a sustained critique of way that picturesque conventions have disguised ecological processes within modern landscapes” (Swaffild, 2002: 171).

In addition, environmental-ecological values and, in particular, ecological landscape and architecture

have been affected by two major sets of factors: the first is the variety of human beliefs and *archetypes*, native values and tacit vernacular knowledge. Second is the complexity of environmental theories, ecological philosophies, and technical knowledge and practice. Although the combination and interactions of these factors may introduce third sets, according to my long-term research in these areas and a survey of other possible areas, I strongly believe the aforementioned twin sets to be the major factors here.<sup>2</sup>

### ***Tacit Knowledge and Vernacular Aesthetics***

Recent Research proves that sources of information on human perceptions, meanings and values associated with managing landforms, water and plants in the landscape are very diverse. The relevant literature is substantial and spans an immense range from ancient religious, spiritual and even mythical references to modern technical and scientific studies.

Norberg-Schulz argues that the landscape where humans live has a structure and embodies meanings (1980). For example, water and xeric plants can be a major meaning-giving element in any landscape, and this is more so in the arid environment. In particular, the special role of water in arid landscapes is not always recognized, but social science research and theory has emphasized the role of water in human perception, evaluation and interpretation of places. The importance of water continues to be recognized by contemporary landscape planners and designers.

### **Lyle, a well-known environmental designer noted that:**

“My design work in the arid and semi-arid landscape has been based on an approach that is both more analytical and subjective. If we can understand nature’s evolved responses and adaptations to conditions of aridity and if we can observe and comprehend the landscape forms that derive from those adaptations, then we might use these as basic archetypes for arid and semi-arid regions” (Lyle, 1999).



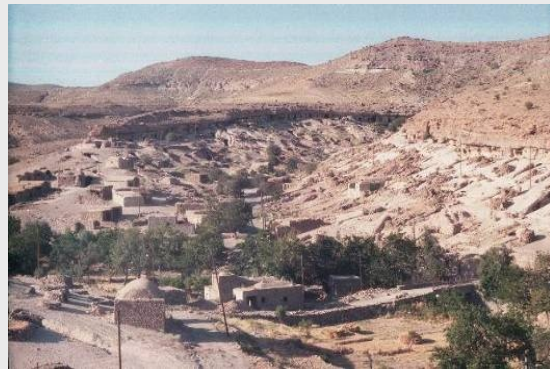
**Figure 2.** Dolat Abad garden in Yazd, with shallow and big pools and long channels both for irrigation and presence of water in central Iran. (Author's personal collection)



**Figure 3.** North Carolina Arboretum, USA, built cascade in Main Square and entrance. (Author's personal collection)



**Figure 4.** Al-Kase village in Saudi Arabia.



**Figure 5.** Meimand village in Kerman, Iran (Daneshdost, 1373).

**Figure 4-5.** Environmental thought and tacit knowledge and finding unity of place, landform, natural barrier and setting the landscape.

**Egoz and Bowring (2004: 65) further argue:**

“Similar to the urban landscape, the landscape modification visible in the farming landscape, native structures are a result of human believes and their creative designs, thus rural landscapes then urban are typified by that particular relationship between environment, people and landform. This relationship, farming landscape [and gardening] as a tangible expressed through aesthetic appreciation of the

expression of the human dimension in the landscape, is well articulated by J.B. Jackson: The beauty that we see in a vernacular landscape is the image of our common humanity: hard work, stubborn hope, and mutual forbearance. Landscapes, which make these qualities manifest can be called beautiful. Their beauty is not simply an aspect but their very essence and it derives from human presence”.



**Figure 6.** Golshan garden in Tabas (Daneshdost, 1369).



**Figure 7.** Way and irrigation channel between gardens in Tabas (Daneshdost, 1369).

I accept the idea of “complex ecological aesthetic” (Egoz and Bowring, 2004) but I wish to develop this idea from the farming and postural context to a variety of classic gardening and landscaping of old rural or suburban areas of Iran<sup>3</sup>. Although we tend to accept these landscapes and potentials as ordinary or specific cultural landscapes that have evolved through time, “these landscapes have to be, in fact, carefully designed and developed. By design, we mean the intended articulation of space and materials to create a landscape that answers functional needs” (Egoz and Bowring, 2004: 64).

#### ***Environmental Design and Deep Ecology***

In this section, the following useful, short extract from McHarg’s book *Design with Nature* (1969) provided by Swaffild can explain MacHarg’s ecological theory and the setting of environmental and ecological dimensions for landscaping:

“We need nature as much in the city as in the countryside. In order to endure we must maintain the bounty of that great cornucopia which is our inheritance. It is clear that we must look deep to the values which hold...We need, not only a better view of man and nature, but a working method by which the least of us can ensure that the product of his works is not more despoliation. It is not a choice of either the city or the countryside: both are essential, but today is nature, which has become precious...The world is abundant; we

require only a defense born of understanding to fulfill man’s promise. Man is that uniquely conscious creature who can perceive and express. He must become the steward of biosphere. To do this he must design with nature” (Swaffild, 2002: 173).

As a basic environmental-ecological theory and ecocentric way of thinking, Ian McHarg’s presentation of an “ecological method” for regional planning and design expresses something of the aesthetic motivation underlying the method during forty years. Although, after all these years, McHarg’s earliest paper entitled “Fitness, the Evolutionary Imperative” provides no satisfaction for sustainable environment and landscape ecology,

“... during this period of time (means forty years ago), no architects knew anything about the environment. I am not sure many know very much about it now. I have not yet been able to find a school of architecture anywhere on this continent, or any other, where architects are required to study *the environment*. This is quiet an extraordinary protestation”. (McHarg, 1998: 13)

However, while McHarg advocated his theory and, fortunately, John T. Lyle’s long term researches on environmental and sustainable design and, in particular, his idea of “Regenerative Design” set forth a powerful expression of a more adaptive ecological approach. Lyle believes that “If we accept that the

current level of ecological consciousness is part of the beginning of a long-lasting, fundamental change in attitudes and environmental values, then landscape architecture must bear a large measure of responsibility for making aesthetic sense out of this attitudinal metamorphosis” (Swaffield, 2002: 176).

Lyle believes that the landscape architects must assume a considerable responsibility for aims and values through their design of the urban landscape. Further, for creating ecologically inspired landscape that is to contain the characteristics of spontaneous landscape, he suggests observation of the following seven points: working with nature; enrichment through complexity; *the landscape as process*; creativity on site; involvement of the users; minimal energy consumption; and the natural landscape outside the front door

While most of the discussion was about the type of an environmental involvement, ecological aesthetics and processing, Egoz and Bowring stated that “Olin went further to suggest that the ecological aesthetic does not conform to particular aesthetic forms, and argued that Nature is what there is. It is we as well as our setting. Nature is not cute; it is not pretty, handsome, or even beautiful”, thus the expression of ecology or nature in design could be “as diverse and simple as life itself” (2004: 65).

It seems that such frameworks for developing an environmental-ecological consciousnesses and cultured landscape quality could be successful in most developed human societies. Thus, we need to extend feasible techniques and present continuous supervision of social-cultural beliefs concerning deep landscape ecology. This may help us particularly to highlight key concepts and patterns of environmental and ecological design through vernacular landscape knowledge in Iran. I state this because that I accept Nassauer’s emphasis on *agro-farming* landscaping:

“Nassauer has identified means by which change can occur in the landscape in culturally sustainable ways. She challenged landscape architects to learn the ‘language’ that communicates the social and cultural values shared by a community. Also, emphasized that public opposition to landscape change stems from social reasons, since the way the landscape looks reflects on those who inhabit the landscape. Thus Nassauer argued that designers must design to frame ecological function within a recognizable system of form” (Egoz and Bowring, 2004: 64).

Finally, she suggested that incorporating ‘cues to human care’ is the means to bridge the gap between a vernacular culture and ecological systems and emphasised that,



**Figure 8.** Kharanagh in Yazd; tacit knowledge serves place making and ecological approach relating to landform and environment.

“it is not a means of maintaining traditional landscape forms but rather a means of adapting cultural expectations to recognize new landscape forms that include greater biodiversity... Therefore, for new forms of ecologically rich landscapes to be sustained, the forms must be recognized and perpetuated by people in everyday situations, maintaining the landscape and creating their own landscapes” (Nassauer, 1995: 161-170).

### **Environment, Deep Ecology and Tacit Knowledge**

The idea of deep ecology is emerging as means of developing a new balance and harmony between ‘Man and Nature’ □ between individuals, communities and all of Nature. As poetically expressed by Devall and Sessions (1985): it can potentially satisfy our deepest yearning; provide faith and trust in our most basic intuitions; give us courage to take direct action; and provide the joyous confidence to dance with the sensuous harmonies discovered through spontaneous, playful intercourse with the rhythms of flowing water, changes in the weather and seasons, and the overall processes of life on earth.

In 1970, Norwegian philosopher Arne Naess published his concept and articulated the distinction between the shallow and the deep approaches to environment. Naess’ thought and philosophy “drew both upon Hindu and Buddhist cosmology and upon the philosophy of Spinoza to propose a metaphysics of interconnectedness” (Benson and Roe, 2000: 16). Although there are other eastern philosophies and cosmologies that might have had an effect of Naess’s thought.

It is noteworthy that, the terms of this philosophy and approach are deeper and more spiritual towards Nature, as exemplified in the writings of Aldo Leopold, Rachel Carson and even Ian McHarg. “The deep approach aims to achieve a fundamental ecological transformation of our sociocultural systems, collective actions, and lifestyles” (Drengson and Inoue, 1995: xix)

Devall and Sessions (1985) declared with regard to deep ecology that the study of our place in the Earth household includes the study of the self as part of the organic whole. Going beyond a narrowly materialist scientific understanding of reality, the spiritual and the material aspect of reality are integrated. As a result, in most of the western culture the idea of dominance of humans over a non-human Nature developed over thousands of years while, in eastern cosmology and in particular Islamic and Iranian paradigms, the *unity of man and nature*, deep environmental ethics and aesthetics formed peoples’ beliefs and *tacit knowledge*.

Ecological consciousness and deep ecology are therefore in sharp contrast with the isolating elements of *nature and creation*. This movement goes beyond fighting against pollution, resource depletion and the global aim for health (shallow ecology). As Devall and Sessions state, Naess developed two ultimate norms or intuitions, which in themselves are not derivable from other principles or intuitions.

“They are arrived at by deep questioning process and reveal the importance of moving to the philosophical and religious level of wisdom. They cannot be validated, of course, by the methodology of modern science based on its usual mechanistic assumptions and its very narrow definition of data [and even separated believe-practice form of environmental approaches]. These ultimate norms are *self-realization* and *biocentric equality*”. (1985: 66)

### **Tacit Knowledge and the “Oasis Paradigm”**

In keeping with the traditions of many of world religions and the tacit knowledge related their real-life, the deep ecology norm of self-realization goes beyond the *non-environmental new modern*. We can find much potential in some rural ecological societies and settlements (such as oases) for improving the adaptation of self-realization and tacit environmental knowledge to the deep ecology movement.<sup>4</sup>



**Figure 9.** Enclosed, beneficial and shady pathway by living with environment in harsh climate at Taft, Iran.



**Figure 10.** Example of an Enclosed Garden and supporting huge adobe walls for cultivating flowers at Mahalt, Iran.

For example, in the context of Iranian culture, art, architecture, and landscape architecture, as a sub-field, proceeds by using a known body of forms. This body is consistent with a vocabulary of shapes, a variety of hidden cultural controllers, which have their roots in religion, and by the application of ideas concerning their use and manipulation with people's participation. Beyond this, is unity and "Human's deep attachment to Nature and presence of the unseen world, gives rise to an assumption of nature as a Garden with evident signs and inferences of an invisible Gardner" (Nassr, 1377).

Therefore, like the other cultural heritage of the world, in architecture and landscaping of many old Iranian settlements and oases around the central plateau, living with Nature and in particular *Living With The Desert* (Beazley and Harverson, 1982) has been a unique experience for its tacit knowledge of shaping and managing the environment for sustainable life. Without the coherence of paradigms and functions, based on the very understanding of environment and ecology, there would have been no place for *delight*, *firmness* and authenticity of structures in a cultured landscape.

Oases and such types of environments and their characteristics demand that the functions of view and shelter, which are somehow combined in *the lawn paradigm*, should be separated. The observer has the chance to take refuge in a controlled microclimate in sharp contrast to the harsh climatic conditions of the desert. Nevertheless, this microclimate is created by a clever arrangement of landscaping features, such as water, vegetation, land, as well as built structures.<sup>5</sup> This is what may be named as the *oasis paradigm* (Taghvaei and Fardanesh, 2002), which until recently has been the basis of desert landscape architecture throughout the history.

In addition, the paradigm has been given a spiritual notion through Islamic landscape architecture in an effort to resemble the "earthly paradise".<sup>6</sup> The role of hard landscape and the built shelter, i.e. the folly or garden pavilion, becomes essential in this approach. Also in this sort of landscaping, the role of medium-sized species should be more strongly emphasized than the play between tall trees versus ground cover vegetation (lawn and shrubs).





**Figure 11.** Shazdeh Garden: famous historic Persian garden in Mahan, Iran.



**Figure 12.** Schönbrunn Palace ,Austria, wide lawn landscaping with different concept. (Author's personal collection)

Finally, vernacular landscape architecture and its planning for sustainability, function, comfort and beauty can continue to serve new movements of landscaping and environmental design, in rural settlements and developing cities. These include the patterns of dividing farms and gardens by native edges, shady alleys, signing natural elements and vistas, fitting waterscape, managing irrigation and landform in landscape, use of regional materials and the importance of texture and color.

### **Conclusion: Sources for Environmental Tacit Knowledge**

As mentioned before, traditionally the beliefs and paradigms of Iranians are a combination of vernacular knowledge, religion, and Iranian traditions. While the acceptance of Islam has resulted in the change of many religious beliefs, the traditional paradigms of respect and honor for natural elements and living things, especially trees and water continued. Up to the present, Iranians have believed that natural elements such as plants, trees, and even bushes, like animals, are innocent and need to be nurtured. They must be kept also because they are useful for sustaining life ecologically.

Thus, when we simply treat architecture and

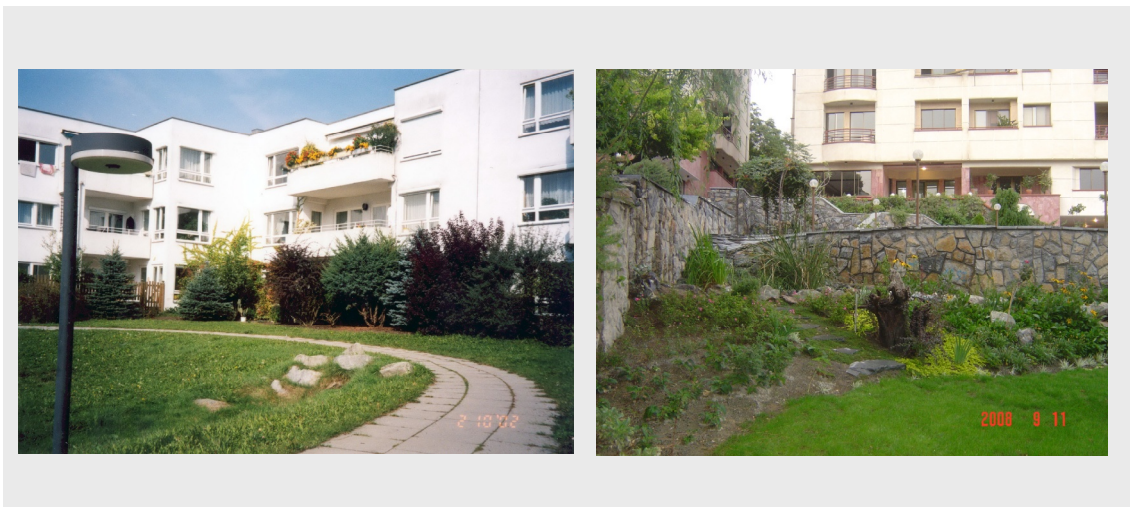
landscape architecture analytically, we miss its concrete environmental-ecological character, that is, the very quality which is the object of man's identification, and which may give him a sense of existential foothold. As Norberg-Shulz' hermeneutics' states, "The man cannot gain a foothold through scientific understanding alone. He needs symbols, that is, works of art which represent life-situation." (1984)

Therefore, with holistic treatment and thinking, beliefs support the conception of man and natural elements as being closely linked together and forming a union. This conception of the relationship of man and nature elevates the thought and culture necessary for survival in today's conditions and in special ones such as harsh climates and arid zones in particular. In addition, an important factor linking natural and human sciences in landscape research is the mutual relationship between man and the landscape, between people's scientific and tacit knowledge and deep ecology. It is an important point that people and social groups not only influence landscapes, but are also influenced by landscapes.

Finally and according to the above survey, unity and cosmology can help to develop tacit and practical knowledge holistically. Therefore, as fundamental sources and a vernacular mode for fostering the

person-environment relationship, *ecological landscape design* is very important. In addition, such an approach can be defined as a *tacit environmental knowledge*, as distinguished from deep ecology, and exploration of the ecological aesthetic and health in particular. However, as Egoz and Bowring (2002) and other

authors and eco-environmentalist landscape designers argue, environmental and ecological health is not necessarily reflected in how the landscape and in particular cultured landscape looks. Moreover, what nature looks like, or is supposed to look like, appears to be our problem, a cultural matter; it has little to do with ecology.



**Figure 13.** New residential settlement and sustainability, Vienna, Austria.

**Figure 14.** Ecologist Landscape Design, Darabad Residential Complex, Tehran, Iran.



**Figure 15.** Environmental and sustainable place making, at Meimand, Iran. (<http://www.google.com>)

**Figures 13-15.** Examples of environmental and ecological design in recent courtyard landscaping . (Author's personal collection)

## Notes

- 1- The survey and research recommendations also include measures for appropriate choice of vegetation: effective use of desert varieties both in landscape design and in environmental preservation; appropriate grading and edges; use of barriers, and promotion of environmental archetypes and native methods and ecological patterns. (Taghvaei, 2005)
- 2- My research during past ten years on sustainability and ecological issues related to landscape architecture. In particular, teaching landscape design programs and ph.d thesis titled: Ecologist Landscape Design
- 3- even some specific urban landscape according special climate, landform and morphological dimensions.
- 4- See; Scholtz , Genius Lusi and Taghvaei, Thesis and Lyle , Regenerative Design.
- 5- For more information on microclimatology see: Simonds, John Ormsbee, *Landscape Architecture: A Manual of Site Planning and Design*, New York: McGraw-Hill, 1998, pp.26-31
- 6-Lehrman, Jonas, (1988) *Earthly Paradise: Garden and Courtyard in Islam*, Hampshire; Thames and Hudson.

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