

Rehabilitation of Nashtifan's Windmills Cultural Landscape by Considering Vernacular Architecture Values

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Abstract

Cultural landscape, which is a result of interaction between human and nature, is the symbol of Identity and Historical values in every region. Recognition and conservation of cultural landscape helps to protect and preserve the existing culture and old traditions in the region. Nashtifan's windmills (As-e-bad) demonstrate the intelligence of the local people in a windy region, that were built on the top of the highest hill in the city, in order to prevent destructive effects of strong winds that blows 120 days in the city. Nashtifan's windmills (As-e-bads) represent the evolution of effective interaction between human and nature by adapting natural limitations in the area. They are also an evidence of identity and rich civilization of Khorasan area, which is more developed and noticeable compared to its neighborhood areas by an intelligent use of wind energy for human amenities. The aim of this study is offering strategies for rehabilitation the cultural landscape of Nashtifan's windmills and preserving their consequential values. In order to reach this purpose, the impressive role of vernacular architecture in rising of these valuable cultural heritages is considered. This research is based on analytical-descriptive and it has been explained based on the use of documents and information and local resources.

Keywords: *Windmill, Nashtifan, As-e-bad, Cultural landscape, Vernacular architecture*

Introduction

A huge part of Iran is devoured by desert and on the east side of Iran where "Khorasan" is located also is one of these desert areas. In Iranian culture and society, respecting the natural desires is very important, so in this deserted areas, respecting water like a rare essence, they use nature in some other ways. They use wind as an important source of renewable energy for their needs. This method is used and sees by other areas especially in architecture of "Badgir" in Yazd.

Nashtifan

Nashtifan city, part of “Khaf” state, is located in “Khorasan Razavi” province. Nashtifan is a suburb area that ends up to desert and is located on the gentle slope of river alluvium of the “Kal shahr” river (Khazari and Imani, 2009). Because of its location on the margin of the desert, the climate is very dry and has very long and hot summers. The elderly believe that the word “nashtifan” is from “Nish” means peak or highest point and “Tifan” means storm that after a while it became “nashtifan” and it is exposed to storm. (Khazari and Imani, 2009) Nashtifan is located from northwest to southeast, so because of its geographical location the 120 days winds blow it vertically (Akbari and Mohammadi, 2014). The 120 days winds of “sistan” are seasonal winds from India that blow from “Afghanistan”, especially from “Tar” desert is stronger and by passing from lower heights of Afghanistan enter Iran. (Arani and Mohammadi and Heydarzade, 2012). The most important properties of these winds are the high speed and regular blowing from northwest, west and southwest in the months of May, June, July and August to the east side of Iran. (Saeidian, 2012) Regularity and consistency of these winds and other local winds like “Nishabour” winds and “Faraah” winds made locals to use advantage of this natural energy as a means to obviate their own needs.

Nashtifan As-e-bads

Nashtifan compare to other village nearby is in higher elevation and for that reason the bluster is more, so it is a better place to build these windmills. The location of As-e-bads in city, is a very thoughtful matter. This correct and right choice, reminds us the knowledge of local residents and their valuable and unwritten experiences again. The local people built the As-e-bads outside of the residential areas and on the top of the highest peak of the city because they didn't want to the urban constructions prevent the wind blow and also the windmills could be exposed to maximum wind blow (Akbari and Mohammadi, 2014). In this way, they could protect the city from blusters too. The next issue is the historic cemetery behind windmills that prevents the constructions in their frontage and also stop creating obstacles in the direction of the wind blow. From old days till today, wheat, barley, corn and others were the most essence of Iranian food like bread. The importance of these grains was the beginning of grinding edible seeds and spices in different ways. The importance of this issue caused the progress of mills and changed them from quern to huge constructions that made the human's life much easier. There are no exact information about the invention of the As-e-bads, but in an old Indian book called “Arthasastra of kontyilia” which is the first written source in 1400 BC, the beginning of As-e-bads was mentioned. Many of the historians believe that these As-e-bads are the proof of Iranian ingenuity and

they started from east of Iran (Sistan and Khorasan) and this industry found its way to Europe, China, India and Egypt. (Jafari and Shamsipoura and Naghdib, 2014)

The architecture of As-e-bads

The windmills range are located on the hill where is the highest point of the city, that the hill is their foundation. In order to increase resistance of the windmills against the wind blow and other natural factors, the local residents built these windmills together in a chain form. Every single of these As-e-bads belongs to the specific person and the ownership goes from one generation to the next one. Today there are only 37 As-e-bads existed. The structure of As-e-bads is very ingeniously and by all simplicity, it shows the human ingenuity. Every As-e-bad includes two floor, the first floor is called "As khane" which is a room with 3 meters height and its roof is covered by the barrel vault (Golabchi and Dizaji and Jahan zoq, 2013). That is flattened on the exterior to position the wings. This floor is the location of the grindstone and the other places like place for cleaning the wheat (Darbad) and wheat depot (Parkhoo). The second floor is a half closed space that the wooden wings are located in between, so they move by a blow of wind. At this space, there are two walls in the opposite of the wind and there is a shorter wall which is placed at direction of the wind and its entrance. The purpose of constructing of this wall is to let wind blow better (25 degree) and much stronger (Golabchi and Dizaji and Jahan zoq, 2013). By the wind blow, the wings that are connected to the grindstone through the "Tirpol" start to move. With their move, the upper grindstone (Asak rooie) moves against the lower one (Asak zirin) which is steady and the seeds grind between them. The only difference between nashtifan As-e-bads and the others is in the rotation axis. In Iran's windmills the rotation axis is vertical but in the other windmills, the rotation axis is horizontal.

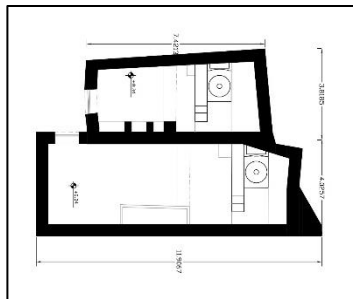


Figure 1: Windmills section

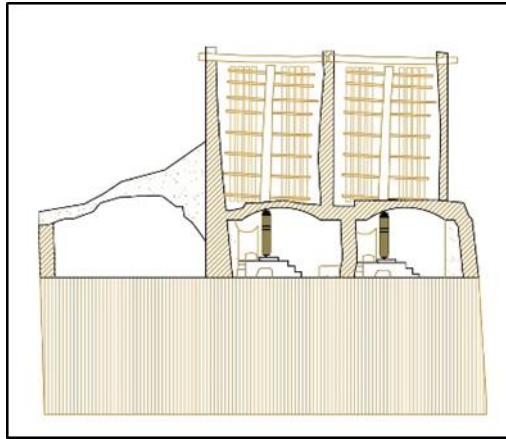


Figure 2: First floor plan

Materials

Using the vernacular materials (Idari) is one of the Principles of Iranian Architecture. This principle has been respected in the architecture of the As-e-bads too. Utilization of local materials allows the architects to access them easier when they need them and has a noticeable effect on the construction costs. The main material used in As-e-bads is clay. In addition to this, wood, metal and stone have been used too. This material is perfectly compatible with the surrounding nature as it comes out of the same nature. In addition to strength of the thick adobe walls, they are the good insulation against cold and hot weather. They also used soil mortar for its construction and also used plaster of clay and straw for external walls. Due to resistance, easy access and formability of wood, the local people used them in order to build mechanical parts of the windmills. The local people supplied their wood from Pine and Ash trees. Metal was used only to connect the mechanical parts. The grinder stone after being hit thorough a specific and special ceremony and transported to the desired location and then been installed in its place. The structure of these As-e-bads is a reminder of advanced engineering and invention of our ancestors that restrained the wind power to improving the quality of their life and with combining it by vernacular architecture created one of the masterpieces.

Nashtifan vernacular architecture

Each region is influenced by the vernacular architecture of the surrounding natural environment and each region has its own local social characteristics, so it can be said that every region has its own unique identity. It should be noted that vernacular architecture of

different areas have similarities such as simple forms, compromising to surroundings, efficiency, utilization of recycled materials, and human scale (Giannakopoulou and Damigos and Kaliampacos, 2011). The vernacular architecture is the result of years of trial and error and ingenuity of local builders which was influenced by its culture and due to environmental conditions has formed (Zhai and Previtali, 2010). It's an essential to studying the vernacular architecture, because it has knowledge values beyond information and numerical values, because these values are able to create standards and cultural insight (Hashemi and Foroughmand, 2016). The villages are the most important places for rising the vernacular architecture. Considering to the richness of nature of every areas, in terms of material and economic power and rely on the resources of the regions, they are self-sufficient habitats. Nashtifan like other Iranian villages use simple vernacular architecture in the unique architecture of As-e-bads and without any damage to its nature still continuing to live. Today, sustainable architecture is one of the controversial topics. Sustainable architecture is a sort of designing that tries to exploit further the nature potentials and can reduce the bad conditions. Environmental protection is one the most important discussion of sustainable architecture (Saeidian, 2012). Therefore, a study of vernacular architecture and operation of local people to natural energies and their use of local materials in the constructions can be helpful in many problems that humans is involved. Nashtifan, located in the arid regions of Iran. Taking advantage of the adobe architecture in arid areas goes back long time ago. Because accessing to the cheapest local materials is one of the indicators of life desert. Utilization of clay architecture with lowest cost and highest space quality caused "Khorasan" be one the regions that using this architecture.

Nashtifan windmills cultural landscape

In the International Encyclopedia of Social and Behavioural Sciences is explained that the cultural landscape shows the formation and successive changes of physical area of human society over time (Akrami and Badri and Nezami, 2014). Cultural landscape often reflects specific techniques of the natural environment regarding to the natural characteristics and its constraints. Cultural Landscape contains a geographical area with natural and cultural origins, which includes events, activities, individuals and even other cultural and aesthetic values as well (Bemanian and Ansari and Almas far, 2010). In fact, the cultural landscape provides a sense of place and identity of an environment. This feature, regarding to environmental changes over time and adaptation to the human cultural needs, forms a part of our national heritage and our life (Mokhles and Farzin and Javadi, 2013). Iran villages, affected by their traditions, customs and different lifestyle, contain a unique and special cultural landscapes which is merged with the life of local residents. Some of the most important factors of forming the cultural landscape in Iranian villages are security of the

region, availability and access to the water, form and type of benefits from the region as well as the way to discipline the area, lifestyle of local resident type and finally, climate of the region (Rastande, 2009). The diversity of Natural conditions and human conditions reveals our territories landscape. This diversity is caused by the interaction between diverse geography and humans, which is formed over history and in the context of culture (*Añón Feliu*, 2002). Based on the results obtained from studies on cultural landscapes, its structure is consist of four main characteristics: religious beliefs and aboriginal beliefs, architectural remains and archaeology, historical and continuous use of the land, privileged landscape and nature well (Bemanian and Ansari and Almas far, 2010). As-e-bad's Cultural Landscape is vernacular landscape in terms of historical aspects. This last is the result of activities and jobs of local residents over many years and reveals their routine life based on their cultural orientation, physical, biological and cultural characteristics. In historical vernacular landscapes, the function plays an important role. As-e-bad's Cultural Landscape represents the integration of wind energy and life of residents that describes Nashtifan identity and has infiltrated region culture in different ways. Its impact can be seen in different cultural issues, such as common proverbs between people, like patient man compared to underlying grindstone, and several ceremonies and celebrations and even other intangible heritages. Some of this intangible heritages have existed among the people over the years and have conferred a specific identity to the region. Therefore, to protect them and transfer it to future generations, rehabilitation of As-e-bads cultural landscape have great importance.



Figure 3: Windmills section

Difficulties

Modernity and the needs to be modern have caused changes on lands without being justified. Nowadays, in different situations, it is much easier and simpler to replace more suitable and novel solutions with a batch of copied/non-original answers (Añón Feliu, 2002). The greatest threat to modern societies, is the uncontrolled urban development, and this last has led to the destruction of nature and villages landscapes. As an important period in human history, the increasing concern about landscapes, places of residence, nature as well as protecting human identity, force us to think about suitable solutions to protect them (Scazzosi, 2002). Cultural landscapes contain the origins of culture and traditions of each region. Human inappropriate involvements and neglecting the landscape have affected this cultural heritage and put their existence at risk. Protection of these sites leads to have a better quality of life and reinforce the sense of place and identity of the area and transfer it to future generations.



Figure 4: Windmills section

Conclusion

Modernization and its fundamental changes in the lives of people in urban areas and consequently in rural areas, is a big problem which are damaged the cultural landscape in rural areas. Therefore, tries to identify the characteristics of the Cultural Landscape and protection and restoration of cultural heritage and natural and human as part of the country, is very important. The rehabilitation of the cultural landscape of Nashtifan's As-e-bads could be done by being accordance with plans and solutions offered by experts. These solutions are obtained after a good understanding of the area by developing an appropriate management plans in accordance with international protection principles and targeting continuous protection. Landscape planning process must respond to economical needs of these landscapes while meeting the environmental services. The European landscape Convention emphasizes on importance of cultural, environmental and social landscapes focused and explains sustainable development by harmony between economy, environment and social conditions. Therefore, considering on enrich vernacular architecture of the

region, whether in the field of construction techniques or materials used in the construction of restoration and also taking advantage of local residents aware of the principles of traditional construction, can be part of the economic needs answers. By using the vernacular architecture and local materials, in addition to the preservation of intangible heritage of construction methods and cultural roots of As-e-bads, we can respect the authenticity of the site. In addition to the physical aspect of the site, for rehabilitation of cultural landscape of As-e-bads, we have to inspire them and revive the old traditions. Rehabilitation of cultural landscape is a coherent and orderly procedure to revive and protect cultural identity and natural of a historical site. Continuation and recognition understanding cognitive gives the values of a land excellence. It can be said that every community originates from the culture and it is its product. Each region reflects the culture and its tangible and intangible values, thus preserving the values that are associated with people's lives is very important and it is a first priority.

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