

## Sustainability in Vernacular Architecture- Outlooks on Iranian Tribes



Ali Sarrafi Nik<sup>1</sup>  
[Sarrafinik@gmail.com](mailto:Sarrafinik@gmail.com)  
0502-927

### Abstract

Sustainability in architecture has taken the notions of livings. So, findings of architectural archetypes and effective parameters on sustainability in vernacular architecture must be concerned. In a case that sustainability in architecture plays an important role among nowadays life, investigating on sustainable architecture parameters in vernacular and tribal life sector would have valuable lessons that needs to be achieved. And tribal tents have values which may help to approach the sustainability in architecture. Tribal life decamps from one place to another, according to their needs for permanence in different climates and environments. It is needed to have a shelter suitable to situation, transferring and displacements. While human activity lies beneath in nature, any liveliness is going to environmental cycle. Thus, a house as a living space would be defined as a type of shelter differ from others and influenced by essence of their life. This paper will analysis the main characters and nature of tribal tents related to sustainability and vernacularity and discuss on policy of results in a way that it could be a guidance for contemporary urban architecture. and discuss on policy of results in a way that it could be a guidance for contemporary urban architecture.

**Key words:**Architecture, Sustainable, Vernacular, Nomad, Tent

### 1. Introduction

Nowadays, there are various approaches and styles in the world unto the architecture. One of the most prominent of these approaches in the recent years is the topic of "sustainability" in architecture. Regarding the limitation of resources being used by human beings on the earth, using these resources correctly and wisely and concerning the coming generations in the future, are of the ever increasing important subjects. For years, incorrect and uncontrolled ways of using the existing resources have caused irreparable damages to the nature and living environment that

---

<sup>1</sup> Ali Sarrafi Nik, is with Islamic Azad University, Heris Branch, Iran(phone: +989143154482; fax: +98411-3323550)

global warming, pollution increase due to the usage of fossil fuels are parts of the results. So, man is looking for the strategies of optimizing and correcting the ways of using limited existing resources, besides provision of his needs and welfare, causing minimum damage to the environment and his life. In this direction, the term of "sustainability" for the first time in 1986 was proposed by the Committee on Environment and Development, as a strategy for confronting the needs of the recent times without endangering the resources belonging to the future generations.

Managing a clean and a healthy environment, on the basis of effective use of natural resources and the ecological principles, and reducing damages on the environment and nature and energy resources are of the goals of a sustainable planning. Mentioning some examples as the guide patterns towards attaining these aims are of the utmost importance. In every country, on the basis of the functional needs and environmental conditions, some situations have been provided by the local people. And sometimes these situations can be regarded as successful examples in adaptation with the needs, concerning the environmental conditions, on the basis of the existing natural facilities. This architecture is known as the vernacular architecture. In Iran, also some examples for the local and vernacular architecture in every location, have useful points in their methods of architectural adaptation regarding the existing needs for today's architects and architecture. Of these situations in Iran, we can name those which are made by the Iranian nomads for their contemporary housing which includes especial and unique characteristics that this type of housing can be regarded as a sustainable pattern for architecture. In this regard, analyzing the characteristics of this type of architecture can include some points that will make clearer the discussions on sustainable architecture.

## **2. Research Methodology**

This study and research is of the inferential, qualitative and analogical ones, because it involves interpreting and analyzing the existing conditions. This analytical and deductive (drawing a conclusion) approach is following the indicators which bring the Iranian nomads' architecture nearer to the patterns presented in the sustainable architecture.

## **3. Definition of Sustainability**

In the Webster's New International Dictionary Sustain means to cause to continue (as in existence or a certain state, or in force or intensity); to keep up, especially without interruption, diminution, flagging, etc.; to prolong." Brundtland Commission has defined sustainable development as "meeting the needs of the present generation without compromising the ability of future generations to meet their needs. Generally In a sustainable community, resource consumption is balanced by resources assimilated by the ecosystem. The sustainability of a community is largely determined by the web of resources providing its food, fiber, water, and energy needs and by the ability of natural systems to process its wastes. A community is unsustainable if it consumes resources faster than they can be renewed, produces more wastes than natural systems can process or relies upon distant sources for its basic needs. "<sup>2</sup> Sustainability refers to the ability to build for today and tomorrow without depleting future resources. A growing global population is beginning to strain the finite resources available on the

---

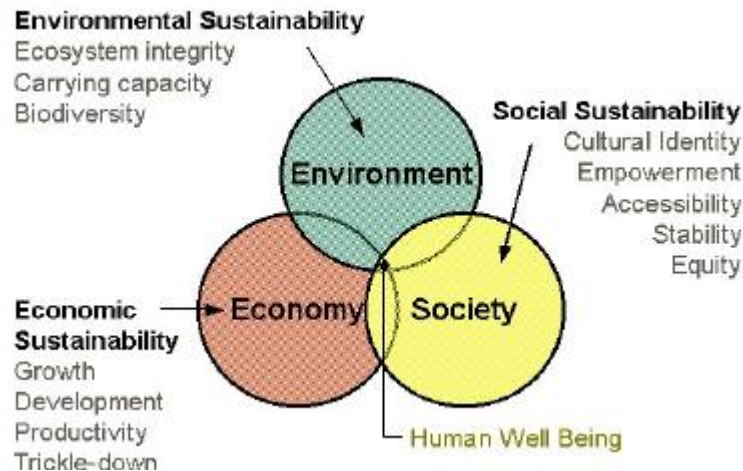
<sup>2</sup> - Sustainable Community Roundtable Report

planet. ...

### 3-1. SUSTAINABILITY

Sustainability is an embracing concept that can give localities a framework within which to approach many of the forward-looking activities they are already doing (or want to do), whether they be recovering from a disaster or making improvements in lifestyle, safety, economic opportunity, or environmental quality. Sustainability is a way of looking at a community within its broadest possible context, in both time and space. It provides an ideal toward which to strive and against which to weigh proposed local actions, plans, expenditures, and decisions.

The classic definition of sustainability is .meeting the needs of the present without compromising the ability of future generations to meet their own needs.. People in every community have social, economic, and environmental needs and in every community the quality, quantity, importance, and balance of those needs is unique.



(Fig. 1): social, economic, and environmental activities

To be sustainable, a community needs to integrate its social, economic, and environmental activities (Fig:1) so that no single goal, need, group of people, or function takes undue precedence over the others.

There are six principles of sustainability that guide a community in ensuring that integration, and in moving itself toward sustainability. These principles can be a checklist for a community to use as it decides where it wants to improve its sustainability, and how to do it.

A community that wants to become more sustainable will

1. Maintain and, if possible, enhance, its residents. quality of life.
2. Enhance local economic vitality.
3. Ensure social and intergenerational equity.
4. Maintain and, if possible, enhance, environmental quality.
5. Incorporate disaster resilience and mitigation.
6. Use a consensus-building, participatory process when making decisions.

It would be good if all communities already adopted a long-term view and incorporated sustainability ideals into their comprehensive plans and other operating procedures and policies, and budgets. But if a community has not yet formally considered broader issues like environmental quality, social equity, or livability, the period of recovery after a disaster can be a good time to start. A disaster brings temporary changes to a community that can be viewed as opportunities to build back in a better way. People are thinking about the problems that they normally do not think about. the risks they face from hazards, the housing situation, the scenic aspects of the community, livability.

Public officials have media attention that enables them to garner support for innovative ideas. A disaster forces a community to make a wide range of decisions, Some of them quite difficult ones. Technical and expert advice becomes available from numerous public and private sources. Financial assistance comes into the community, enabling it to tackle more ambitious projects than would normally be the case.

Most simply, the idea of sustainability, or ecological design, is to ensure that our actions and decisions today do not inhibit the opportunities of future generations

### **3-2. Environmental Sustainability**

Environmental dimensions of Sustainability are reduced waste, effluent generation, emissions to environment, reduced impact on human, health, Use of renewable raw materials and elimination of toxic substances.

The idea of environmental sustainability is to leave the Earth in as good or better shape for future generations than we found it for ourselves. By a definition, human activity is only environmentally sustainable when it can be performed or maintained indefinitely without depleting natural resources or degrading the natural environment.

Resource consumption would be minimal materials consumed would be made energy of 100% post-consumer recycled materials or from renewable resources (which were harvested without harm to the environment and without depletion of the resource base)

Recycling of waste streams would be 100% Energy would be conserved and energy supplies would be entirely renewable and non-polluting (solar thermal and electric, wind power, biomass, etc.)

### **3-3. Sustainable Architecture**

Sustainable architecture is a general term that describes environmentally-conscious design techniques in the field of architecture. Sustainable architecture is framed by the larger discussion of sustainability and the pressing economic and political issues of our world. ... And it is a term currently in fashion, which is based on the fundamental misconception that Sustainability can be achieved at the scale of the individual building. Because sustainable architecture has no generally Agreed upon definition, the term is applied to any building that has included some combination of ecological features.

Sustainability must be practiced at the scale of the city-region, orchestrating interwoven systems. Therefore, architecture, Alone, cannot be sustainable.

## **4. Vernacular Architecture**

Historically, the terms regional and vernacular are virtually interchangeable. The linguistic root of the term vernacular, from the Latin root vernaculus, refers to a native language or dialect, especially its normal spoken form. It denotes commonly used, recognized, and understood

speech patterns characteristic of a specific locale. This is what sociolinguist Dell Hymes refers to as the 'ethnography of speaking. As such, it stands in contrast to the Formal literary language of a society that is oriented toward global academic discourse.

By and large, this distinction applies to vernacular buildings and vernacular landscapes as well. Vernacular buildings and settings are regionally distinctive, regionally representative, and regionally understood. How, why, to what extent, and by what means such spaces, forms, and features occur is determined by a particularized set of local as well as external influences. Over time, these elements become part of the predictable pattern of use and expression within a region or sub region and are carried out on both a conscious and subliminal level, as well as being embraced across broad socioeconomic barriers. This blending of pre-existing and imported elements assembled into distinctive localized expressions has been characterized variously as cultural weathering, realization, or hybridity. The first notion, cultural weathering, views and regional settings as the product of layers of collective change over time, whereas the last (hybridity) stresses the amalgamation of two fixed entities into a third, identifiable thing.

And in Iran some types of vernacular architecture founded in tents witch be made by nomads

#### **4-1. Nomads vernacular Architecture**

Black- tent is a type of tent the tribal women weave from the hair of the black goats. Nomads have fixed places to reside in summer and winter quarters. They usually live and rest under these black-tents. For some considerable reasons, black-tents are always weaved from the goat hair. Firstly, a tent made by goat hair is rain resistant and usually keep the rain off through its seams. Secondly, goat hair is available and cheap to provide. Every family usually owns 20 to 50 heads of goats, and the black-tents are weaved by their hair. Thirdly is its lightweight quality, and in comparison with the tarpaulin tents, they are easier to compact and carry. In sunny summer days, it is pleasant to rest and relax under these black-tents.

The traditional and economical pastoral life is one of the forms of nomadic lifestyles, which is the combination of customs and techniques, using natural facilities in unpleasant environments such as deserts, high mountains, etc. According to this definition, nomadic lifestyle is based on domesticating and flocking sheep, and the requisite factor for this lifestyle is therefore, having access to the green pastures, and finding them during the year. Pasture and the weather condition are the determine elements for the time of migration, and domesticated animals are the guides. In this type of living, nomads' peace is related to satisfaction and health of domesticated animals. The main nomads' shelter is a portable tent that is usually black (black-tent), and usually women weave them from goat hair and sometimes with a combination of sheep wool .These tents are raised and expanded over a wooden pole and are connected to the earth by ropes, and they are raised and packed easily and fast(Filberg,p.124-127). Using goat wool and hair, acts as a type of heat insulating material, which controls the outside and inside heat exchange.(Figs. 2~3)



(Figs. 2~3: Nomad tents)

#### **4-1-1. Good relationship with the natural ground**

The correct way of relationship between the architecture and the ground and its context, as one of the major items, is considered in the modern architecture, so that, it can include most of the behavioral benefits of the building form confronting the range of natural powers till the amount of energy consumption.

Considering this fact that the Iranian nomads live in the mountains and deserts, so they raise their tents to live in, and the way of settlement of the tents on the slopes and the forms of the given tents, can be determined in confronting the natural elements surrounding them. Accordingly, the selected building materials have also this capability to be flexible and changeable and be replaced according to the direction of the sunshine and the wind. Flexibility and spherical form of the tents cause their structures have the least resistance against the air stream, and also help them to the stability of its building and reduction of the temperature wastage.

#### **4-1-2. Natural ventilation**

Circulation of the natural air in the space can be regarded as a major factor for a healthy life, decreasing the inside temperature and provision of physical comfort. Using fresh and natural air and natural ventilation is playing an effective role in this direction.

Provision of compatibility and the needs by using the Renewable Resources, is one of the aims of sustainable architecture. And in this direction, the cover of the shelters being used by the Iranian nomads is so that it makes the fresh air possible to enter them in the hot seasons of the year and play an important role in making the inner space more pleasant.

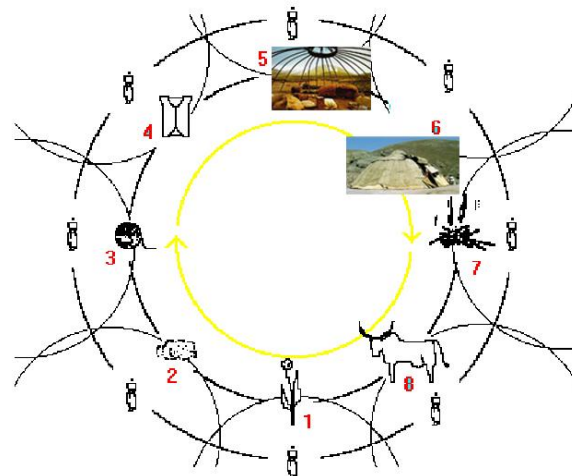


(Fig. 4: Nomad tents)

#### **4-1-3. Use sustainable materials**

Using the natural materials for building the tents of the nomads, both in the structures, and in the inside and outside coverings, are in the direction of local and vernacular architecture, and Compatible with climate, which can be brought following the discussions of sustainability in the architecture. The materials, considering their lightweight and high efficiency in flexibility, on the basis of physical conditions, and resisting against the heat conductivity factor, are of the best items which have been used in the nomads' architecture. On the other hand, using the materials which are originally taken from the nature and the local materials can be of the

positive points for this type of architecture. And they are in the continuation of the discussions which make this type of architecture nearer to the sustainable architecture discussions, because, as a benefit for this method, the materials taken from the natural origins are possible to be involved in the process of the returning to the nature. And today sustainable architecture is also following this aim. The picture (Fig. 5) explains the cycle in which the materials used in the nomads' tents, and the journey from the production to their return to the nature.



**CYCLIC AND NATURAL PROCESS OF PRODUCTION**

Closed loop Cyclic Relationship Feedback Control Without Waste

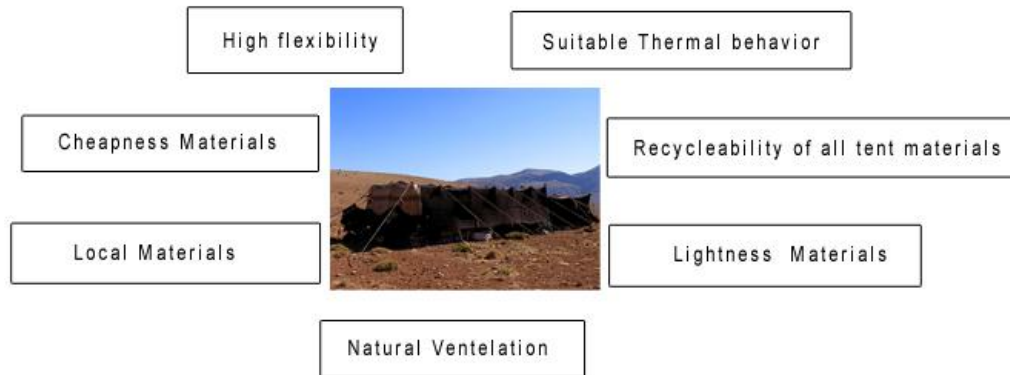
(Fig. 5): cycle the materials used in the nomads

Of the other advantage for the used materials, is their high resistance against the water leakage, so that, leakage of moist and water is in the minimum possible rate, whereas the inefficiency of the petroleum derivative materials in the modern tents are completely obvious, and their unsuitable temperature behavior and instability against the heat, and the low resistance against the natural factors, being not returnable to the nature, are all the major differences for the new artificial materials in comparison with the natural ones.

As, one of the effective factors for sustainability of the architecture is using the energy in the best form of it, and reduction of its waste, by using the natural materials, and also aiming control of the heat exchange rate, this shelter is considered as a climatic house in a small scale with a suitable temperature behavior. Using the skins, hairs and natural animal coverings as a shelter in the Iranian nomads' architectures seems an intelligent selection according to the needs and possibilities, because these elements in the natural world are of the most sufficient elements which keep the animals safe against chill and heat. Now, when this very covering is used as a shelter for man, it is natural that it will work more suitable in comparison with the



unnatural and artificial materials.



(Fig. 6): tents benefits

## 5. Conclusion

Regarding the presented discussions, and as a total conclusion, we take result that local nomadic architecture in Iran is based on a fundamental basis which is also one of the basic pivots in sustainable architecture. And we can name this type of building as a pattern for the sustainable architectures.

Paying attention to the Renewable Resources, using in construction of the tents, paying attention to the natural environment, adapting the architecture and changing the form and the shape of it, according to the physical and environmental conditions, paying attention to the needs of the residents, preparing their physical comfort in the shelters which have the best behavior against the natural factors, having the capability of replacing and movement for the whole structure of the architecture and it's the sample of portable architecture , are all the advantages of this tents.

Using the materials, taken originally from the nature, in structuring the nomads' tents, has advantages including the capability of returning to the natural cycle, having suitable temperature behavior, lacking harmful materials for the nature, and also using the materials which have no environmental pollution sequences, are all the indicator points for these tents.

A collection of these factors caused these nomads' tents become considered as the patterns for the sustainable architecture, having the characteristics which can be effective for the improvement of our architecture.

## References

- Eicker, U.(2009).Low energy cooling for sustainable buildings. Britain:Wiley*  
*Gernot, M.(2006). Building with Earth(Design and Technology of a Sustainable Architecture).Berlin: Birkhäuser.*  
*Jenks,M . Dempsey,N.(2005).Future Forms and Design for Sustainable Cities. Britain: Elsevier*

Kingston WM, H.(2009). Vernacular architecture and Regional Design: *Cultural Process And Environmental Response*. Oxford: Elsevier

Nicolaisen, I., & Gunnar Fielberg, C. (1993). *Nomads of Luristan: History, Material Culture, and Pastoralism in Western Iran (The Carlsberg Foundation's Nomad Research Project)*. Britain: Thames & Hudson

Rueter, P( 1998). *Town Centers: Why? What? How?* Portland, Portland State University, School of Urban and Public Affairs, Institute of Metropolitan Studies, Community Fellowship Program.

Sam, C M .(1996). *Sustainable Architecture*. Japan: SABD.

Stang, A. Hawthorne, C.(2005). *The Green House (New Directions in Sustainable Architecture)*. New York: Princeton Architectural press

*The 2005 World Sustainable Building Conference in Tokyo.*(2005). SUSTAINABLE BUILDING DESIGN BOOK. Japan: SB05 Tokyo.

William O'Reilly, *The Aga Khan Trust for Culture*. (2006). Sustainable landscape design in arid climates. Geneva : Aga Khan Trust for Culture

<http://anthropology.ir/node/251>(Accessed on 17 March. 2011)

[www.lehighcement.com/Education/Lehigh-Education-Glossary.htm](http://www.lehighcement.com/Education/Lehigh-Education-Glossary.htm)(Accessed on 17 March. 2011)

[en.wikipedia.org/wiki/Sustainable\\_architecture](http://en.wikipedia.org/wiki/Sustainable_architecture)(Accessed on 22 March. 2011)

[http://architecture2030.org/the\\_problem/buildings\\_problem\\_why](http://architecture2030.org/the_problem/buildings_problem_why)(Accessed on 22 March. 2011)

<http://www.sustainableenterprises.com/Community/shelter.htm>(Accessed on 24 March. 2011)

<http://blog.sustainablog.org/hard-lessons-in-sustainable-living-the-tent-trauma/>(Accessed on 26 March. 2011)

<http://www.sustainablebuild.co.uk/NomadsTents.html>(Accessed on 26 March. 2011)

[www.lehighcement.com/Education/Lehigh-Education-Glossary.htm](http://www.lehighcement.com/Education/Lehigh-Education-Glossary.htm)(Accessed on 1 April 2011)