

Module 15 : Sustainable Design

Lecture 40 : Sustainable Design and Traditional Architecture, Northeast Region, Household Sustainable Design, Sustainable Kerala Architecture, Rajasthan Architecture, Persian Chahar Bag Garden Architecture (550 BC), Conclusion

The Lecture Contains:

-  Sustainable Design and Traditional Architecture
-  Persian Chahar Bag Garden Architecture (550 BC)
-  Conclusion

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Sustainable Design and Traditional Architecture

One cannot ignore the traditional architecture that flourished around the world in harmony with environment. Indian subcontinent produced some of the finest architectural marvels in tune with the environmental sustainability. The traditional architecture has popularly utilized local indigenous material such as- stone, clay and timber, which are easy available. Depending on the geographical condition the use of natural material varied.

Following are some of the traditional architecture in the Indian subcontinent-

Northeast Region

In the Northeast region due to heavy rain



Plate 5A Northeast Bamboo House



5B Bamboo House under construction



5C Village Meeting

(Source: https://www.google.co.in/search?hl=en&q=Traditional+Bamboo+houses+in+Northeast+India&bav=on.2,or.r_qf.&bvm=bv.44770516,d.bmk&biw=1333&bih=615&um=1&ie=UTF8&tbn=isch&source=og&sa=N&tab=wi&ei=vEFiUdihKs6WrgeCh4GQBQ#imgc=8yDML0xE2sliiM%3A%3B7zr8uoPTkSwAfM%3Bhttp%253A%252F%252Fwww.infrawindow.com%252Fcontent%252Fecodev%252F1334126782.jpg%3Bhttp%253A%252F%252Fwww.infrawindow.com%252Feco-development%252Ftraditional-housing-best-for-quake-prone-northeast_160%252F%3B612%3B459 ; April 8, 2013;

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Northeast Region of India receives plenty of rain. Naturally the houses are built with sustainable material. Bamboo is one of the most important natural materials that grow in plenty in the Northeast region. Bamboo and cane withstands high moisture and water. Because of the heavy rainfall the region heavily depends on bamboo for their survival. The houses (plate 5A-5C) are constructed above the ground level. It is elevated above the ground (plate 5B) with the help of timber and bamboo construction material. The space below the house is used for the shelter of the domesticated animals and other storage material. Interestingly similar traditional structures are found all over China, Japan, Bali and other Pacific islands. Such designs continue to practice in the rural areas. Hence, it carries strong sustainable design mechanism harmonizing with the local conditions.

Household Sustainable Design



Plate 6A Products made of Grass



6B Bamboo & Grass



6C Bamboo Furniture

(Source:

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Use of local straw and grass (plate 6A-6B) are quite popular in the Northeast Region. Light weight and elastic material have been regularly used in their household chores (carrying bags). Similarly bamboo has provided wide range of household design varieties. Bamboo is popularly used for various furniture design (plate 6C) including chair, table, sofa, etc.

Exercise: Sustainable Design encourages recycling material. Create household product out of waste material that we throw away from home.

Sustainable Kerala Architecture



Plate 7A Kerala Village House



7B Rural Housing



7C Boat House

(Source: <https://www.google.co.in/search?q=traditional+kerala+house+architecture&hl=en&tbm=isch&tbo=u&source=univ&sa=X&ei=J0ZiUavcFoSGrAfDq4HQDw&ved=0CDcQsAQ&biw=1333&bih=615#imgsrc=isUjKqBdtXy9zM%3A%3BsB9fgce4k466qM%3Bhttp%253A%252F%252Fwww.keralatourbackwaters.com%252Fimages%252Fpadmanabhapuramb.jpg%3Bhttp%253A%252F%252Fwww.keralatourbackwaters.com%252Fculture%252Farchitecture.php%3B500%3B333>; April 8, 2013)

The state of Kerala is well-known for their typical architecture design. It receives heavy rainfall. Instead of use of bamboo Kerala uses coconut palm trees and leaves for architectural constructions along with other household products. The roof is covered with terracotta tiles with sloped-tiles (plate 7A- 7B). Majority of the houses do not use typical industrial material. Instead they construct with coconut trees-trunk and roofing with baked tiles. Kerala having plenty of back-water uses boats for communication. Houseboat constructed with the indigenous material for tourism earns significant amount of revenue. The designs reflect strong sustainable design solutions that have lasted for centuries.

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Rajasthan Architecture

Rajasthan has contributed significantly in the history of Indian architecture.



Plate 8A City Palace, Jaipur



8B Stepwell (Baori), Bundi, Rajasthan 1699 AD

(Source : <https://www.google.co.in/search?q=traditional+rajasthani+architecture&hl=en&tbn=isch&tbo=u&source=univ&sa=X&ei=vkhiUamOLszrrQfwk4EI&sqi=2&ved=0CC0QsAQ&biw=1333&bih=615#imgc=WT00SrSPH5DHAM%3A%3BYk9dEB2QFNU3GM%3Bhttp%253A%252F%252Fwww.luxurytripsindia.com%252Fndiatouritineraries%252Fimages%252Fcitypalacejaipur.jpg%3Bhttp%253A%252F%252Fwww.luxurytripsindia.com%252Fluxury-trips-india%252Fmemorable-india-vacation.html%3B326%3B320>; April 8, 2013)
<http://architecturalnews.in/fwindow.com/features/baoris-of-rajasthan-a-sonnet-in-stone/>; April 8, 2013)

In contrast to the Northeast and Kerala region Rajasthan does not experience such heavy rains. In general Rajasthan region has limited rainfall. The indigenous materials, stones of different types are used in every construction. Constructions of palace buildings (plate 8A) to Stepwell (plate 8B) are made of local stones. Dry seasons with little rainfall experience extreme heat during the summer and extreme cold during the winter seasons. Therefore, the traditional constructions have created designs to remain cool in summer and warmer during the winter seasons. Windows and various openings are designed to circulate natural air to cool inside the building during the summer and closed the openings to remain warmer in winter seasons. Thus, sustainable design remained a primary force of mankind for their survival and comfort from ancient time without electricity.

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Persian Chahar Bag Garden Architecture (550 BC)

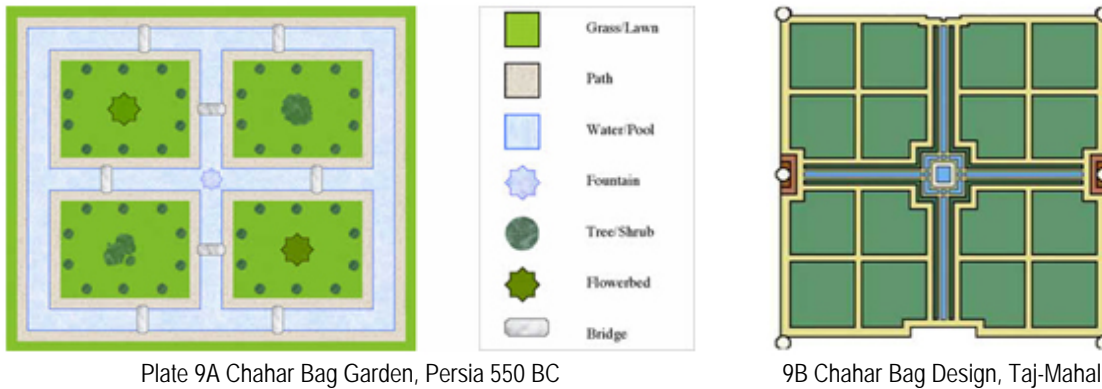


Plate 9A Chahar Bag Garden, Persia 550 BC

9B Chahar Bag Design, Taj-Mahal

(Source : http://www.google.co.in/imgres?imgurl=http://reep.org.uk/resources/islamicgardens/images/2chahar/chahar_plan1.jpg&imgrefurl=http://reep.org.uk/resources/islamicgardens/designchaharbaglayoutt.php&h=300&w=600&sz=27&tbnid=dUWA4eIWJPY5BM:&tbnh=62&tbnw=123&zoom=1&usg=__fXMJvV6_F82YIDcGLxkFc2wr7rA=&docid=tXvThQ7e1x2PM&hl=en&sa=X&ei=1VtiUduLNobqrAeW4IDQBg&ved=0CD0Q9QEwAg&dur=342; April 8, 2013)

Plate 9B : <http://www.taj-mahal.net/augEng/textMM/gardensparadiseengN.htm>; April 8, 2013)

The Paradise Garden is a form of garden, originally which was known as 'paradise' in Persia (550 BC). The four great rivers of Persia- Pishon, Gihon, Tigris and Euphrates play symbolic role in the overall design of the Paradise Garden. Chahar Bag (plate 9A- 9B) is the extension of the original concept of *The Paradise*. It consist of the following basic design elements-

- A raised platform to view it from
- A pavilion provides more permanent shelter than the original tent,
- Strictly aligned, formally arranged trees, especially the *Chenar* trees to provide shade
- The perimeter is walled for privacy and security
- Odor (scent) and fruit are important elements in this *pairedeza* or paradise, which realizes the symbol of eternal life, a tree with a spring issuing at its roots.

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The Chahar Bag Garden surrounding the square area creates a 'well of cool air' that circulates inside the garden. The air circulation above the water body (channels) surrounded by the rows of trees traps the air inside the garden and it creates natural air-conditioning, which is a well thought landscape design. Thus, the outside dry hot air gets inside and remains cooler because of the flowing water channels. The paradise garden takes some of its character from its original arid or semi-arid homeland. The most basic feature is the enclosure of the cultivated area.

- This excludes the wildness of nature, and
- Includes the tended, watered greenery of the garden
- The commonest and easiest layout for the perimeter walls is that of a rectangle, and this forms one of the prime features of this kind of garden.

Therefore, the Persian Garden Architecture and Landscaping reveals the philosophy of Sustainable Design that harmonizes with the nature.

Conclusion

Modern Industrial Design has drawn wide range of experiences from the traditional design concepts. The traditional design concepts are drawn from the ancient practices that have always harmonized with the nature using indigenous resource material. The keen observation and understanding of nature has resulted in creating harmonizing relationship between man and nature has developed a sense of unity (ethical) that has remained perhaps the greatest source of inspirations. Until the arrival of modern design philosophy the traditional concepts have shown their close relationship with the nature in term of seasonal changes, water-body, flora and fauna and other natural paradigms. The harmonious relationship with nature remained the core of man's aspirations and creative pursuits. Therefore, addressing an understanding of Sustainable Design concepts would lead to much healthier design solutions.

