

Sustainability in Traditional Concepts of Architecture and Planning

Farha Shermin

Dr. Mainak Ghosh

Abstract

It is usually believed that the concept of sustainability is a relatively new idea. The 'Brundtland Commission's final report,' 'Our Common Future' prominently defines sustainable development as: 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. Considering this definition or any other definition of sustainability for that matter, it cannot be denied that, sustainability has been the key to the traditional concepts of architecture and planning.

Traditional architecture and planning has been just a solution to the needs and problems of the society and these solutions have been a result of years of experience and knowledge.

This research paper is an attempt to look into sustainable architecture and planning as a tradition concept and to comprehend the importance of those concepts in modern India where sustainable development is unconditionally necessary.

This has been achieved through documentation, analysis and thorough research of the case of Sualkuchi, which is a planned historic weaver's settlement in the state of Assam, and is a major centre for silk production since centuries.

Key Words: Sustainability, traditional, planning, Assam, historic.

1. Sustainability in Architecture and Planning and It's Principles:

Sustainability has been defined numerous times in numerous ways. The Brundtland Commission's definition is one of the most widely accepted ones. In addition, the Chartered Institution of Building Services Engineers, (Cheshire, Attenborough and Grant, 2007) has defined sustainability as "Providing for the needs of the present without detracting from the ability to fulfill the needs of the future". It can be said that sustainability deals with the relationship between human and natural systems while considering long term impacts.

There has been several studies regarding sustainability by prominent scholars and based on their studies the main principles of sustainability has been summarized as follows (Mansouri, Curwell and Dowdle, 2009):

- Respect of the user's socio-cultural values
- Adapting the climatic conditions
- Energy conservation
- The use of local material
- Respect the location (site conditions).
- Water Efficiency
- The use of natural light and ventilation
- The studied use of colours
- Treatments for ecological problems such as noise pollution

Sustainable architecture is the architecture that unites time and architecture and represents the unity of aesthetic, socio-economic, engineering and technology, natural and ecological demands based on the principles of sustainable development (Leyzerovaa, Sharovarovaa and Alekhina, 2016).

2. Sustainable Architecture and Planning – A Traditional Concept

Sustainability is usually considered as a fresh new concept which is being spoken and written about extensively. However, when enquired into the culture and tradition of India, it can be seen that sustainability has been an embedded idea in the Indian traditional system of architecture and planning since history.

The traditional settlements in India have all evolved as a sensitive response to the surrounding, the ecology, climate and also culture. Spiritual believes is another factor which has helped to conserve many natural elements like trees and rivers and water bodies. And unlike architecture today, traditional architecture is not an individual entity. It always has a peculiar relationship with the surrounding, as the surrounding environment is also the source of life for all those living there (Oliver, 2006).

2.1 Methodology

The research being exploratory in nature, a qualitative analysis was the approach that has been adopted. The main modes of inquiry of the study were through interviews, documentation, observations and secondary sources. Oral history has been a very significant tool to study the history of the settlement as very few written records are available. The settlement was strategically chosen for the study on the basis of its history, traditional character and socio-economic, architectural and ecological condition at present. A thorough literature study was also carried out to understand the different aspects of sustainability which has helped in the analysis of the study.

2.2 Sualkuchi – Introduction

Sualkuchi is a settlement in the Kamrup district of Assam, India, which has its earliest mentions from 4th century BC in Kautilya's *Arthashastra*. It has developed ever since as a major production centre for Assam silk, especially the indigenous Pat and Muga silk.

The essential structure of the settlement as it exists today was first established by Momai Tamuli Barbarua, an administrator of the Ahom kingdom during the reign of Swargadeo Pratap Singha (1603-1641). The development of sericulture in Assam was aided due to this patronage (Morol, 1979). The traditional architecture and planning of the settlement had developed as a response to the natural environment and most importantly to accommodate the function of weaving.

The significance of the settlement as a silk production centre can also be judged by the fact that while the settlement was being planned during the 17th century, people from different occupation backgrounds (like fishermen, goldsmiths, potters, fish-net makers etc) were brought in to support the main 'Tanti' (weaver)'s community. This is apparent, as the settlement was planned on the basis of these occupation based communities (Shermin, 2017)

Sualkuchi is prone to earthquake and floods and as a result, the physical growth and traditional architecture of the settlement has evolved as a response to the natural environment.

2.3 Traditional Architecture and Planning of Sualkuchi

Traditional Architecture: The traditional architecture of the settlement is a result of the quality and value that the particular culture has produced. It is typified by a durable bamboo framework, and mud plaster. Ikra houses are the common typology seen in the whole of the settlement. Ikra is a local reed that is extensively used in the construction of the roofs and walls. The significance of the architecture has a lot to do with the environment, climate and 'weaving' other than aesthetics. The Ikra and bamboo construction material keeps the interiors cool in summer and warm in winter and also helps in sustaining during earthquakes. Structural strength that influence earthquake safety of the house include good configuration, light weight material used for wall and roofs and flexible connections between various wooden elements at different levels (Kaushik and Babu, 2009).

The main occupation being weaving was very well incorporated in the houses. Most of the houses had a weaving room which was designed with the traditional loom as a module. Fenestrations in the weaving room were based on the height of the traditional loom so that it received enough light throughout the day (Fig 1).

Traditional Planning: The settlement of Sualkuchi lies in an ecologically significant area. Its boundaries are formed by the natural features, that is the Bor beel (a wetland) to the north west, the Gandhmou hills to the east, the river Brahmaputra to the south and the Siddeshwar hills to the west. The Siddeshwar hills form a small valley in between. This valley seems to connect the Bor beel and the Brahmaputra River.

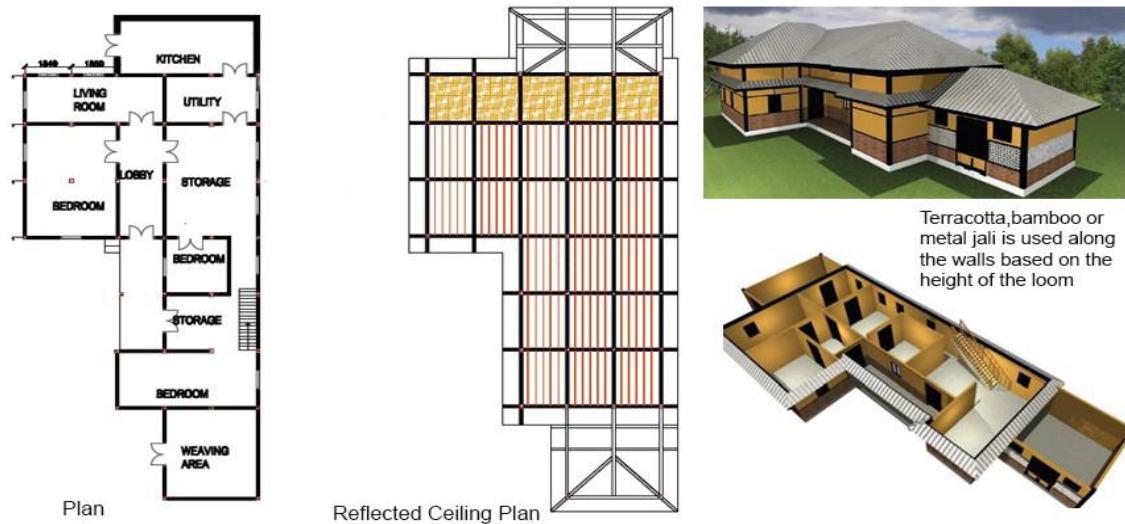


Fig 1, A traditional house plan showing a weaving room with fenestrations based on the height of the loom

Source: Author

There are a number of manmade 'pukhuri's (ponds) which act as water reservoirs during dry seasons and also recharges the ground water. These ponds are strategically located as per the natural drainage and a number of such ponds are located along the Siddeshwar valley connecting the Bor beel and the river. This whole system ensured drainage of the water to the river and thus avoided floods.

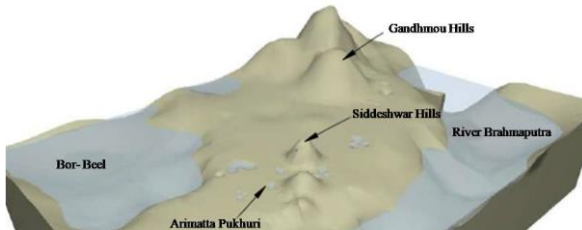


Fig 2, The Natural Setting of Sualkuchi

Source: Shermin 2017

As already mentioned, the settlement was planned on the basis of occupation.

The occupation based communities were placed on the site according to hierarchy and also feasibility of work place. For example, the Koiborto Para which is the fishermen's community is located near the river bank, whereas the Mahanta Para which is the priest's community were placed in the heart of the settlement. The same exists even today. A water canal was built to ensure continuous water supply to the settlement from the river.

The weaver's communities settled on the west of the canal was mostly planned in a grid iron pattern, where each cluster is bounded by roads on all four sides. All the houses faced the roads and the central area of the cluster was an open space to grow mulberry trees. The heart of the settlement where the two primary axial roads meet formed the market place.

Each cluster functioned as an individual unit which combined with other clusters to form a system. With reference to the figure 3, it is clearly seen that the spaces for every activity related to silk weaving is clearly designated.

Linear spaces along the roads are used for drying the silk yarn and the finished fabric. The common open spaces bounded by two or more dwellings are used for silk reeling. The weaving of the silk takes place inside the house. The market forms the core of the settlement where

the finished products were sold. This design of the traditional clusters ensured mutual co-operation and involvement of the whole community in the activity of silk production which in term ensured efficiency, feasibility and self sustaining capability.



Fig 3, Traditional Clusters

Source: *Shermin 2017*

2.4 Modern Developments and It's Impacts

Understanding and incorporating the context in design is one of the main aspects of sustainable design and planning, which when ignored leads to unfortunate conditions. The same is the case with Sualkuchi today. A major change is the construction of a ring road along the Bor beel, which has blocked the natural water drainage to the river. Moreover the manmade ponds which formed an integral part of not only the water harvesting system but also aided water drainage, has been filled and built upon.

The planning of the traditional clusters has been an important setup which ensured smooth running of the process of silk production. This system does not exist today in the newly developed areas of the growing settlement which not only effects the production of silk but also has ecological impacts.

Ikra houses with sloping roofs were climate responsive, low cost and sustainable in many ways. Those have now been replaced by concrete and glass and flat roofed houses which are incorrectly and yet proudly considered to be a sign of social status.

3. Conclusions

According to the discussion above, it can be said that, though the aim of traditional architecture was not sustainability but it supported sustainable behavior, a local sustainable environment and also accommodated sustainable components of design.

Development is necessary but it is important to understand that modern development has the potential to either enhance or degrade the existing environment. In such a situation, sustainable development of our urban as well as rural areas is an urgent task which should aim at creating healthy, ecologically viable areas while meeting the needs of the people. Moreover, the historic environment is the context in which modern developments takes place. Therefore, it is also very crucial to appreciate that environment and traditional sustainable strategies which are tried and tested and are in use since history.

About the Authors



Farha Shermin
Research Scholar, Department of Architecture
Jadavpur University

Farha Shermin holds a Master degree in Architectural Conservation from School of Planning and Architecture, New Delhi and is currently pursuing PhD at the Department of Architecture, Jadavpur University. Her main area of interest is the study of Indian traditional settlements. Her research and publication interest include heritage conservation, vernacular architecture and traditional settlement planning.



Dr. Mainak Ghosh
Associate Professor, Department of Architecture
Jadavpur University

With more than ten years of teaching and professional experience, currently, Associate Professor in Jadavpur University, previously being faculty in IIT Kharagpur, his research interest revolves around environmental perception and behavior in context to designed spaces and objects. His notable designs include Coochbehar University and Engineering College in West Bengal. He has several accolades, publications and projects to his credit. He has been invited speaker to the Smart City Congress in Paris 2015. He has travelled exhaustively to USA, UK, Canada, Brazil, Singapore for his project works and allied research.

References

- Cheshire, D., Attenborough, M. and Grant, Z. (2007). *Introduction to Sustainability*. [ebook] Norwich: CIBSE Publications, p.1. Available at: <http://www.cibse.org/getmedia/b209af98-d8a4-431b-85d2-ae6b304afafa/Intro-to-sustainability-b.pdf> [Accessed 17 Jan. 2019].
- Kaushik, H. and Babu, K. (2009). *Report #154: Assam-type House*. [online] World-housing.net. Available at: <http://www.world-housing.net/asia/report-154-assam-type-house> [Accessed 1 Jul. 2018].
- Leyzerovaa, A., Sharovarovaa, E. and Alekhina, V. (2016). Sustainable Strategies of Urban Planning. In: *International Conference on Industrial Engineering*. [online] Elsevier, p.2057. Available at: <https://www.sciencedirect.com/science/article/pii/S1877705816316186> [Accessed 13 Jan. 2019]
- Mansouri, A., Curwell, S. and Dowdle, D. (2009). *Sustainable Architecture And Urban Development: A State Of The Art*. [online] www.researchgate.net. Available at: https://www.researchgate.net/publication/316694076_Sustainable_Architecture_And_Urban_Development_A_State_of_The_Art [Accessed 16 Jan. 2019]
- Morol, B. (1979). *Sualkuchi*. 1st ed. Guwahati: Bharat Press
- Oliver, P. (2006). *Built to meet needs*. Oxford: Architectural
- Shermin, F. (2017). Impacts Of Rural Tourism On Architectural and Cultural Heritage - The cases of Sualkuchi and Mawlynnong, North-East India. *International Research Journal of Engineering and Technology (IRJET)*, [online] 4(11), p.320. Available at: <https://www.irjet.net/archives/V4/i11/IRJET-V4I1156.pdf> [Accessed 10 Jan. 2019]