

INDIAN INFLUENCES: INTERPRETATIONS IN LE CORBUSIER'S ARCHITECTURE FOR THE TROPICAL ENVIRONMENT

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ABSTRACT

Tropical architecture of Le Corbusier, one of the masters of modern architecture, has made immense influences worldwide. This paper tries to rediscover the master architect in terms of inputs he obtained from the context while designing for the Indian subcontinent. The nourishment obtained from the nature as well as the culture and society helped shape the work of the western architect to a considerable degree. His expressions were modern and his very own, but fitted well with the climate and the society of the place.

Daylight and temperature during different times and seasons, monsoon rain, prevailing breeze, immediate and extended landscape, all were considered by the architect with due respect. The paintings, the music and the poetry of the subcontinent helped Le Corbusier to create visual and mental image of the place. A part of the architect's work was influenced from the studies made during his visits to the built environments urban and rural. He had turned to the sources of local wisdom in devising environment-modifying features for his subcontinental designs.

The paper draws upon resources from the doctoral thesis of the author on the environmental performance of buildings designed by Le Corbusier where an in-depth study was made on the environmental features of both Le Corbusier buildings and traditional buildings of the subcontinent. It highlights the influences of the traditional strategies in the buildings of the master architect in terms of solutions to climatic problems. References are also made to the factors influencing Le Corbusier's design such as social, cultural and political aspects. Thus the paper helps in getting a fuller understanding of how the works of the modern master from the West were integrated with the total context of climate and culture of the subcontinent.

Keywords: tradition, culture, urban and rural context, environmental strategies, environment modifying features.

I. INTRODUCTION

A. Basic Approach



Figure 1: Assembly, Chandigarh by Le Corbusier

Le Corbusier's dreams for a large-scale design and planning came true with the commissioning of the design of Chandigarh, the capital of Punjab, India. His Indian works include the master plan and the capitol complex of Chandigarh [Fig 1]; and Millowners Association building, Museum, Sarabhai house and Shodhan house in Ahmedabad designed between 1952 and 1955.

Le Corbusier was respectful of the geographical, climatic and cultural context of the subcontinent. Ahmedabad and Chandigarh has basically hot dry monsoon climate. Although the architect could sense, feel and identify the problems of climate almost intuitively, he approached the design in a very methodical and scientific way.

II. INFLUENCES AND INTERPRETATIONS

A. Societies and Culture

Le Corbusier had always referred to India as a 'civilization' and was fascinated by the Indian culture. In his notebook, he recorded his thoughts before the first meeting with the Indian team who had invited him for designing Chandigarh,

'It is the hour that I have been waiting for:
India the humane and profound civilization.
To construct a Capital:
Urbanism is the activity
Of a society
A Capital is the spirit
Of a nation
A set of tools
It is a Conjunction,
..... Le Corbusier is an optimist'... [1].

Indian religion and cosmology interested him. He absorbed whatever he could of the local social environment. He understood the need for privacy and the habits of outdoor sleeping spaces in very hot days. His suggestions for a comfortable and thus productive work hours for India had included the *siesta* break during extreme hot weather.

B. Nehru

Friendship and strong support of the Prime Minister Nehru specially helped the realization of Le Corbusier's dreams and ideas of an architecture for India. Nehru wanted Chandigarh, the capital of Punjab to be modern, and symbolize the belief in free, democratic and scientific future of the newly independent country. Equipped with modern architectural vocabulary, the architect fulfilled this desire by successfully accommodating program, climate and society.

C. Site and Nature

Respect for the site is visible in all of Le Corbusier's works. According to him, site was the

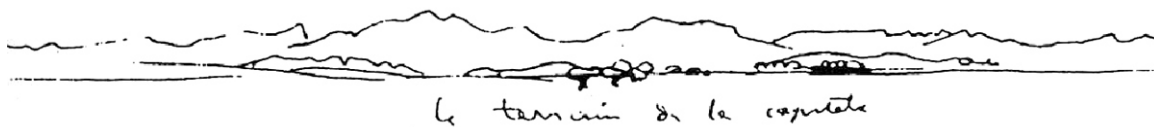


Figure 2: Site sketch, Chandigarh by Corbusier [1]

source of nourishment for the soul. In India, the analysis of sun and wind was the first step in his designs. He made numerous visits to the Chandigarh site. The vast fields dotted with a few mango trees and the immense presence of the Himalayas in the distance had a great influence on Le Corbusier's thinking [Fig 2]. Inspired by the nature of the site and beyond, he decided that the capitol complex would be his offerings to the Himalayas.

D. Climate

As acknowledged by the architect, the climate was the major concern in his tropical works. In India, Corbusier wanted to make a 'pact with nature' unlike his earlier works of the cold climate where he was to 'combat the nature'. And that he had to address the harshness of relentless sun, rain, high humidity and hot wind of this special climate

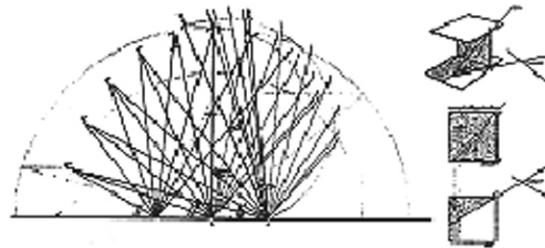


Figure 3: Sketch of sun angles and related sunshades by Le Corbusier. [1]

Le Corbusier's scientific approach involved collecting detailed climatic and geographic data, identifying the architectural problems related to the hot dry composite climate, and then devising solutions with the help of his offices in India and Paris [Fig 3]. The first part of this solution was called the 'Climate Chart' or 'Grille Climatique', which had three main columns titled, (i) conditions of climate, (ii) modifications needed for indoor comfort, and (iii) architectural solutions for achieving comfort. This Climate Chart was used extensively in the subcontinental designs.

E. Rural Architecture

The architect looked and saw, sensed and felt the rural environment with keen interest. He studied the traditional solutions to problems of the intense sun visible in the compact site planning, shaded courtyards, thick walls, small openings, roof overhangs in the huts of Gujarat and Punjab villages [Fig 4,5]. Thermal mass of thick walls and deep recessed shaded openings were traditional strategies explored, in his own special architectural language, by the architect throughout his tropical buildings.

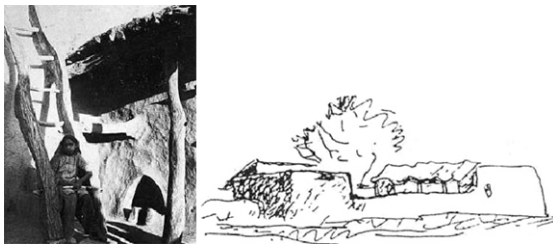


Figure 4,5 Punjab hut and sketch, Corbusier [1]

F. Temples

The spirit of institution was captured by the maestro while visiting the Buddhist temples and universities. The thick walls, the quiet solemn quality of the interiors inspired him to think of a place for congregation, which would encourage high thinking.

Le Corbusier admired the sculpted walls of Hindu temples, and he believed that the dark cool mystic environment of the temples had 'clear intention and meaning'. [2].

G. Urban architecture of 'Old Towns'

He visited old cities of Ahmedabad and looked at the buildings in terms of indoor and outdoor environment. He studied the *Havelis* or country

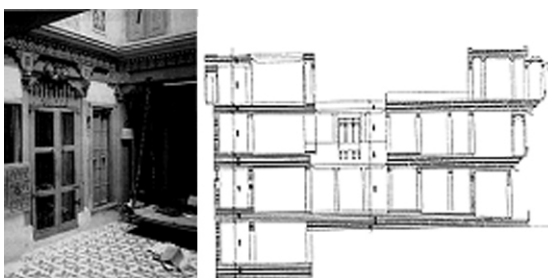


Figure 6, 7 View and section of *Haveli*, Ahmedabad

houses of the *Pol* or neighborhood with narrow winding streets, building shading building, shaded courtyards, and various elements of environmental control [Fig 6, 7].

F. Courtyards, Verandahs, Shading and Ventilation Devices

Shading devices such as *chujja* [sunshades], *jali* [perforated screens], *jharokah* [protruded bay window] and verandahs provided the architect with the answers to the environmental problems [Figure 6.7]. He realized that the rooms should not be flooded with direct daylight because of the heat, and the incoming sunlight needs to be controlled and made softer. He employed the idea of traditional *jalis* or perforated shading screens in the buildings at Chandigarh, which had openness but cool daylight. *jali* also provided natural ventilation to the interior. The shading devices called 'brise-soleil' at the Secretariat and assembly echo the provision of soft light and cool air of *jail*[Fig 8-12].



Figure 8, 9: Sarabhai house, Shodhan house

H. Mughal Architecture

The environmental strategies of Mughal buildings utilized most by Le Corbusier are layering of walls,



Figure 11 *Jali*, Mughal building Figure 12, 13 Assembly and Secretariat shading

spaces and roofs; large columned halls or forums; elements of shading and natural ventilation. The architect had stated, 'Comfort is in the shades, it is in the coolness of currents of air, and in the shaded naves of Mughal palaces' [Fig 14,15]. He tried to reinterpret the essence of tradition by producing similar shaded columned halls or forums in Millowners Association Building at Ahmedabad and in Assembly Building at Chandigarh [Fig 16,17,18]. Resonance of the layering of spaces of the cool interiors in Panchmahal, Fatehpur Sikri is found in Corb's designs. Similar to the

Panchmahal's *Chatri* roof, the top roof in the High Court at Chandigarh reflects most of the heat and the air flowing in between the two roofs drives the incoming heat away [Fig 19,20]. His solutions always included shading and natural ventilation, which were common features of Mughal buildings.

I. Miniature Paintings

Miniature paintings of the subcontinent intrigued Le Corbusier [Fig 21]. He studied the movements of 'Dancing Krishna' showing many sides/planes



Figure 14, 15: Columned hall, layered spaces, Mughal buildings

Figure 16: Layered space, Millowners Building



Figure 17 Columned hall, Assembly

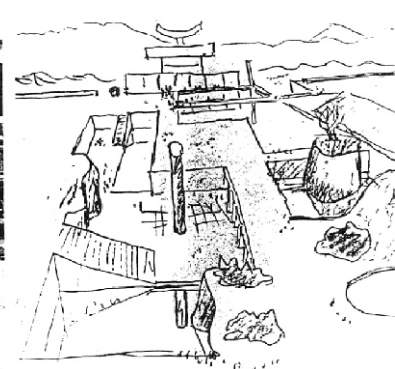


Figure 18 Fatehpur Sikri, Agra & Governors Palace, Chandigarh by Le Corbusier



Figure 19 Double roof, High Court



Figure 20 Chatri, Panchmahal

and movements in a single two-dimensional painting; and he tried to utilize this theme of interpenetration of planes and the movement of spaces in his architecture.

Again, the semi open environment of the Corbusian design in the subcontinent was a re-creation of spaces depicted in the miniature paintings [Fig 8,9,16,22].

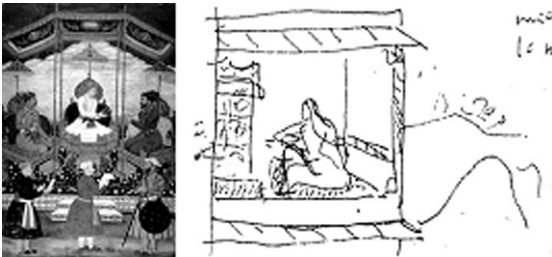


Figure 21 Miniature painting and Sketch of verandah by Corbusier

J. Indian colors

Colors found in the landscape, paintings and clothing of India inspired the architect in the designs of the tapestries for the Chandigarh buildings [Fig 23]. He had also used these bright colors in the walls of Chandigarh and Ahmedabad buildings [Fig 22].



Figure 22 Walls, High Court

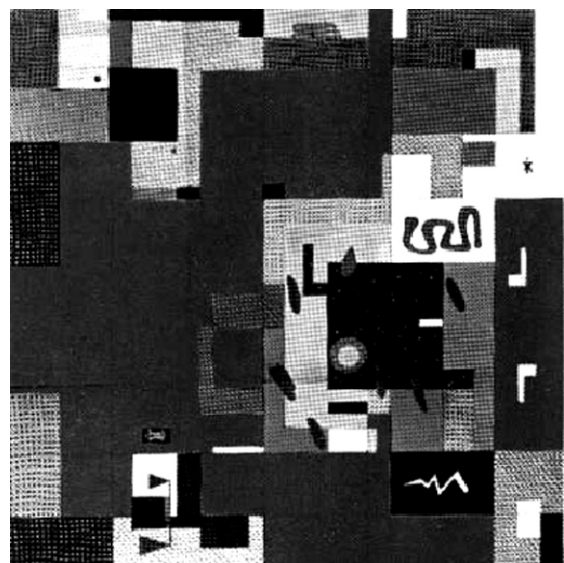


Figure 23 Tapestry at High court

K. Landscaping

Le Corbusier studied the landscape design of Mughal and older architecture of India [Fig 24]. The use of water in the interiors and exteriors of Mughal buildings enabled evaporative cooling, which is an effective environmental strategy in the hot dry tropics. His Assembly and High Court sit on large water bodies [Fig 25].



Figure 24 Water bodies in Shalimar and Agra



Figure 25 Water bodies in Assembly and High Court

The traditional Indian buildings had gardens and verandahs with profuse greenery, which reduced heat in the environment by the process of photosynthesis. The architect employed this idea in his buildings, gardens and even in sunshades of High Court, Chandigarh and Millowners Association Building, Ahmedabad.

Roof gardens and roof ponds seen in Mughal architecture such as the house of the court singer Rai Pravina helped keep the indoor cool by providing insulation, reducing direct heat and with evaporative cooling of air. Use of these is seen in Le Corbusier's Sarabhai house and the Museum at Ahmedabad [Fig 26,27,28].

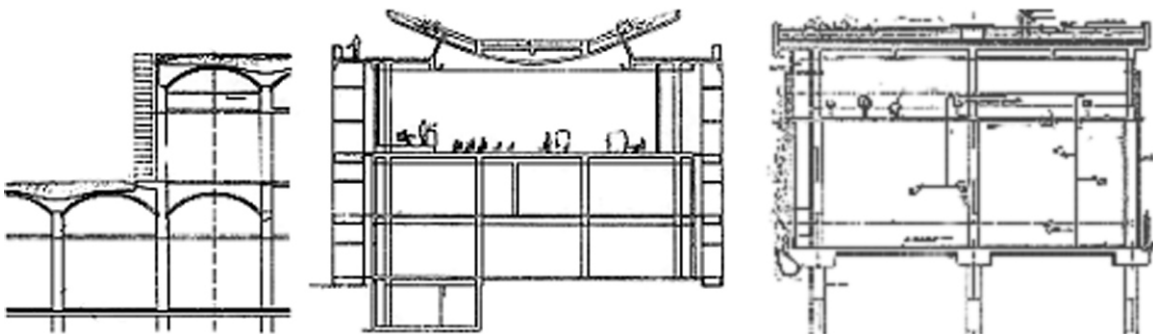


Figure 26, 27, 28 Sections showing roof garden and roof pond in Sarabhai, Millowners and Museum.

L. Lutyen's Architecture

Le Corbusier had studied British architect Edwin Lutyen's buildings in New Delhi, in terms of how the imported English Renaissance was 'Indianized' by Lutyen with the traditional climate-modifying elements such as the *chujjas* or extended canopies, verandas and water bodies.

M. Influence of local architects

Le Corbusier studied the buildings of local architects in terms of aesthetic as well as climatic aspects. He was respectful of the suggestions of local architects who worked with him in India, and had listened to the ideas of young architects B. V. Doshi and A. Raje regarding the utilization of prevailing breeze in Ahmedabad buildings.

The detailed landscape planning of the city of Chandigarh was done with the help of the Indian landscape architect M S. Randhawa. The architect's ideas of small hills of colored flowers, organic gardens of seasonal bloom and shading trees were successfully executed with Randhawa's input. The streets were to be lined with trees appropriately planted to bar the western sunlight hitting the driver's eyes while returning home after work.

4. CONCLUSION

Le Corbusier's environmental strategies in architecture for the hot dry monsoon climate of Chandigarh and Ahmedabad in India were synthesis of the input he had obtained from the context, his own experiences and ideas. These include layered spaces, layering of walls, planted roof, roof pond, sunshades and shaded opening,

deep porch, 'brise-soleil' or sunscreens, courtyard, ventilation, thermal mass or thick wall, large columned halls and landscaping with green and water. Many of these are improvisations and own interpretations of the traditional strategies. Thus it is seen that among the various forces shaping the Indian architecture of Le Corbusier, learning from tradition of the place in question played an important role.

REFERENCES

1. W. Boesiger, O. Stonorow and M. Bill, Ed.: *Le Corbusier: Complete Works*, London: Thames and Hudson. (1970)
2. Z. F. Ali: *Environmental Performance of the Buildings Designed by the Modern Masters in the Tropics: Architecture of Le Corbusier and L I Kahn in India and Bangladesh*. PhD Thesis, Environment and Energy Studies Programme, The Architectural Association School of Architecture, London (2000).