



# SUSTAINABILITY THROUGH COST CUT TECHNIQUE OF AR. LAURIE BAKER

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**Abstract:** The term “sustainability through cost cut technique” is belongs to some architects works of low-cost housing and their influence on architecture. Now a days sustainable and low-cost housing is very trending in architecture. At present, people demand urban and lavish life style with affordable and ecofriendly living. There are many structural examples of cost cut techniques which was used by sir Ar. Laurie Baker and some architects still follow his work. The entire concept of sustainability is connected with ecological, economic, human, cultural and historical dimensions. Each dimension carries Baker’s supporting work. The Library at CDS is one of the dream projects of CDS founder and India’s known economist and social thinker Professor K. N. Raj as a K. N. Raj Library. The credit for this spectacular earth work to Ar. Laurie Baker. His principle and selection of material is spark up the latest technique which they used in their projects.

**KEYWORDS - Sustainability, Vernacular, Modernism, Economic, Ecological.**

## 1. INTRODUCTION

For low cost housing we have some specialized architect who work on it. That’s why research focus on sustainability through cost cut technique with the contribution of Indian Ar. Laurie Baker is also known as “Gandhi of low-cost housing”. He was one of the architect who thought of poor and seek humans, and want to provides dwelling for everybody. Baker’s work was simple and attractive which aims at less consumption of energy. His design was mostly skilled with brick work and vernacular material like lime, Mangalore tiles, stones, etc. Centre for development studies (CDS) located on northern outskirts of Trivandrum in residential area is one of the master strokes of Ar. Laurie Baker. CDS built on sloping contoured site with each structure curled in wave and semi-circular arc.

## 2. RESEARCH METHODOLOGY

### Post-Independence scenario in India-

During of British rule period, colonial architectural style had been introduced across the country. At that time Europe was approaching modernism and experiencing massive growth in the industry In India, the local architecture diverse in terms of types. Internal courtyards, veranda’s, pitched roofs, mud or masonry seats are some elements of vernacular architecture. In 16th century, Portuguese arrived and present European ideas to local architecture. Then they stated by building churches, converts and palatial mansions. That results the local architecture acquired a new perspective in the scale factor.

### Current Scenario in India-

In the current scenario Architecture is a wild practice of beliefs and phenomena. Aesthetically, people dislike vernacular architecture and attract towards modern trends. At present, number of materials are used to clad a structure to achieve aesthetic look. For example, stone cladding used for natural look or sometime sustainable look. Now a days, very less architects left who worry about issue of conservation of energy, depleting natural resources, carbon foot print of built environment and other related issue. Out of this, some architects go on the footprint of Ar. Laurie Baker for his philosophy, practice and works.



Fig-1.1

### 3. INFLUENCE OF AR. LAURIE BAKER-

Ar. Laurie Baker born on March 2, 1917 and brought in Birmingham England, his actual name was Laurence Wilfred Baker. He came across 'The mission to lepers' organization in 1945 in India. This organization aims to find architects or builder to built new modern hospitals. Ar. Laurie baker set up his mind to grab this job and built homes and hospital for the lepers. In architecture, he was one of the stare who challenged the natural material submission through his practice. The objective of this paper is sustainability in Baker's philosophy through his words and works.

### 4. INFERENCES OF BAKER THROUGH LOW COST-

#### 4.1 Design Principles:

Baker specialist accepted in applying vernacular standards to advanced construction technology. He said that we ought to take forward by including present day innovation to that which has as of now been finished by our precursors and contribute to it instep of contradicting it.

#### 4.2 Plan Form and Structural Form:

Ar. Laurie Baker in his claim words said, "Always living near to nature, learn numerous lessons from the plan of god's manifestations. Exceptionally seldom do we discover the square or rectangle but exceptionally regularly the circle is utilized. The straight line is uncommon, but the elegant bend is frequently seen, curiously logical perception is that the length of the divider encasing given area is shorter in the event that the shape is circular and longer on the off chance that the shape around the same zone may be a rectangle.

#### 4.3 Materials Used:

Normal locally accessible materials were favored over cutting edge materials. This included brick which were locally made. The choice of these materials stemmed out from the got choice of these materials stemmed out from the got to be genuine and utilize negligible energy.



Fig-1.2

#### 4.4. Techniques Employed:

Baker utilized methods watched by progressing on them, he applied vernacular standards to advanced development strategies, as the conventional strategies frequently had apt solutions to current day issues confronted in construction.

#### 4.5 Labor Employed:

He himself taken part within the development prepare, sanctioning the part of a designer, builder and temporary workers at the same time. He worked with a little of artisans and contractors prepared by him. Customarily development was carried out by skilled worker, this practice has been acknowledged by dough puncher in his practice as well. There's the issue of unemployment in India, preparing local people as bricklayers or indeed location aides made a difference fathom the issue.

#### 4.6 Elements and Measures Taken for Cost Reduction:

Each step taken within the entirety handle of designing and executing a venture was a cognizant one towards.

### 5. WORDS AND WORKS-

Gandhi told Baker that his knowledge of western architecture would be little help in India in 1943. Where the rural areas needed more attention than the cities. Gandhi gave Baker his thought of building houses, saying that the materials required to construct a house ought to be obtained from inside 5 miles of the location. This idea was to have a great impact on the architect's life a few years down the line." (Ref-Bhatia, 2000) Baker adopted and adapted with India more than any other Indian. Baker making chairs for leprosy patients in Chandakh and Uttarakhand in early days to building small little modest houses and community buildings in Kerala. His practices are reflecting his understanding of culture, climate and context.

#### 5.1 Ecological: Earth, the planet of our own-

*"I have never doubted that in a country like ours any of us has any right to squander or waste, or use unnecessarily money, materials or energy." [1]*

**5.1.1 The Hamlet-** The genuine identity of an modeler is reflected within the way he plan his claim house. It is a manifestation of his character, standards and building convictions. The construction process outlines he over said cite by Baker highlights the conventional and Cumulus Mumbai 2015, 5 natural way towards home and advancement. [Fig-1.3]



Fig-1.3

### 5.2 Economic: Being cost effective-

*“The equation that a cost-effective house is a house for the poor, implying a bad looking house, can definitely be proved wrong. Isn't it the responsibility of the upper and middle classes to stop indulging in extravagance and make better looking houses instead?” [1]*

**5.2.1 Slum Rehabilitation at Chengalchoola, Trivandrum-** Baker's entirety life went into making houses for the masses. Seeing his financial skills over the building he was advertised numerous lodging ventures by the Government of Kerala. The Angler town, where he was able to bring a communal agreement through his design and Chengalchoola Slum rehabilitation project, where he maintained a strategic distance from a reiteration based mass generation culture taken after by organizers and architects, are the notable ones. These ventures can be seen as a genuine commitment to country. [Fig-1.4]



Fig-1.4

### 5.3 Human: Respecting Individuality-

*“I never build for classes of people, HIG, MIG, LIG, tribal, fishermen and so on. But I will build only for a Matthew, a Baskaran, a Muneer, or a Sankaran” [1]*

**Residence for Keith-** For Baker, each person was one of a kind. There was no inclination towards his/ her social, financial course or maybe there was an endeavor to person choice, propensities and behavior. Each of his ventures is an astonishing blend of client's necessity and his cunning and inventive reaction. Here, Keith's home is total reflection of his way of life. It doesn't utilize power and is completely subordinate on nature's laws. The little creatures and animals, which may see wild to an urbanized mentality, are domesticated here. He says, “Baker combined the soul of client and soul of maker and makes something out of this Cumulus Mumbai 2015, 7 worlds”. [Fig-1.5]



Fig-1.5

### 5.4 Historical: Learning from Traditional and Vernacular-

*“Our modern, advanced scientific minds should know how to assess the merits and demerits of historical and factual evidence of the way people who have lived in a particular setting and climate, have coped with the problems which are still inevitably ours today.” [1]*

### 5.5 Culture: Incorporating Modernity-

*“We should remind ourselves that it is not ‘Advancement’ or ‘Development’ or ‘Progress’ to indulge in modern building materials and techniques at tremendous expenses and to no good effect when there is no justification or reason for their use, instead of older, simpler, inexpensive methods.” [1]*



## 6. CASE STUDY-

### 6.1 CENTRE FOR DEVELOPING STUDIES, ULLOOR, TRIVANDRUM, 1971-

In spite of the fact that huge portion of Baker's life was spent through in serving individuals through planning residences, he too show his extend of concepts in different capacities, scale and measurement through this open building. Baker intellectuals taken care of the advancement through his imaginative arrangements. Usually best clarified in different piece of middle for Creating Ponders, where the institution needed advanced foundation. Utilizing double dividers, with a little exhibition in between, he made a cover for it's clients. Lively brick jaalis encourages not fair the cross ventilation and day lighting but moreover anticipated a one of a kind built-form character. Through this, he reacted to at that point unpredictable control cuts and decreasing the power bills. [Fig-1.6]



Fig-1.6

#### 6.1.1 Foundation-

The structure of the campus including 6 story circular library tower provided with variant design on rocky terrain as foundation for maintaining natural economy in cost. Random rubble, lime sand and cement were used in foundation. The whole structure is built with vernacular material and less use of concrete is found in it. There is an exposed plinth of a structure with random rubble granite and white contrasting with the red of the brick.

#### 6.1.2 Wall-

The walls of library are made up of 6 story circular diminishing tower surrounded by circular staircase. Baker was making the lime on site by burning sea shells and grinding it and used lime mortar for his walls. He provided openings near the sloping terrace in outer wall lead to the framed glass window and the traditional jaali. Compressive strength of Brick: 105 kg/sq.cm. [Fig-1.7], [Fig-1.9]

#### 6.1.3 Flooring-

The flooring convey a cool comfortable base to walk in red oxide which also complementing the earthy material of wall and roof. There is a shape of flower and leaf in external pavement in concrete, inset with granite aggregates. [Fig-1.10]

#### 6.1.4 Roof-

There is a traditional roof on library which made up of vernacular material. Filler slab made with Mangalore tile over a folded concrete slab which eliminate the use of timber and lightening the roof weight.

#### 6.1.5 Staircase-

A circular tower of library enclose a circular staircase in a circular hollow shaft, wind runs from bottom to top This shaft is hollow load bearing which aims to provide more area for easy movement. There are small openings in shaft at each floor to provide forced ventilation inside the spaces. This is based on simple principal of stack effect which helps in air circulation in the upward flow and reaching each and every level by reducing the heat effect. [Fig-1.8]

#### 6.1.6 Jaali-

Jaalis are the perforated screens which distribute the harsh glare and allow air flow. The numerous designs of traditional brick jaalis creating amazing pattern of light and shade insight the building and permit light and wind at the same time. Ar. Laurie Baker plays with lights and shadows, comfortable spaces and jail also helped him to do so.

#### 6.1.7 Filler slab-

Filler slab is a cost-effective roofing system based on concrete portions and instead placing filler material there. It includes brick tiles, cellular tiles and used as a replacement. Library tower having this technique of cost effectiveness at each story. [Fig1.11]

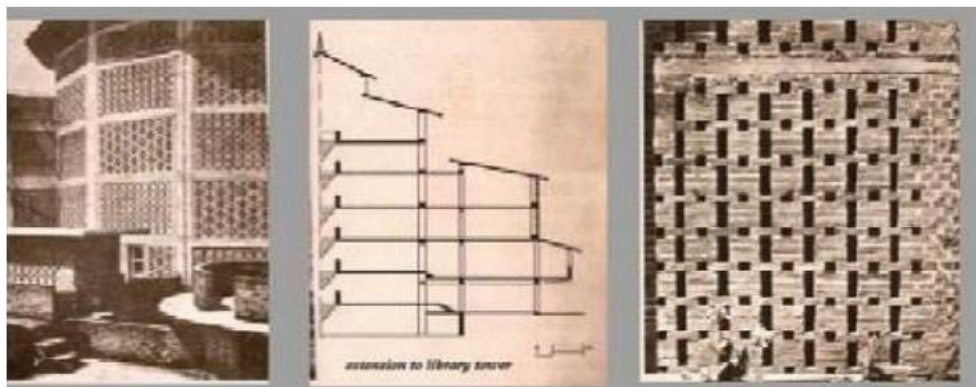


Fig-1.7



Fig-1.8



Fig-1.9



Fig-1.10



Fig-1.11

## CONCLUSION-

The position and choice of Cutting-edge Design to neglect and disregard the traditional knowledge isn't important for a nation like our own where tradition is full of tested advancements. Like, other crafts and information, building and architecture are one of the zones where we have ignored everything around tradition within the title of modernity and practicality. Specially, when there's a breeze of sustainability in design environment, there's a have to be come up with grounded, relevant and basic methods. On the opposite the Designer who have been impact by Baker are drawn closer for a 'Baker Style home' and not so regularly for a home which costs little. But now a day through his contribution, it is in a most recent trend of low-cost and sustainable housing. Most of the methods utilized by him are very much implementable and fulfill today's architectural, environmental and social needs.

## ACKNOWLEDGMENT

Author is grateful to Ar. Palash Agrawal, faculty of P. R. Patil College of Architecture, Amaravati, for constant encouragement, proper guidance and useful suggestions.

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