

Housing Patterns in Lakkundi: An In-Depth Study

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Article Information	ABSTRACT
<p>Article history:</p> <p>Received Jun x Revised Nov x, 20xx Accepted Dec x, 20xx</p>	<p>Lakkundi, a historic village in Karnataka, India, renowned for its medieval temples and monuments, presents a fascinating case study of evolving housing patterns. This paper explores the architectural transformation from traditional to contemporary housing in Lakkundi, focusing on the socio-cultural, environmental, and economic factors influencing these changes. Traditionally, Lakkundi's houses were constructed using locally available materials such as mud, stone, and terracotta, with designs that reflected joint family structures and climate-sensitive architectural principles. However, as modernization and urbanization take root, contemporary homes are increasingly characterized by using concrete, steel, and other industrial materials, shifting towards nuclear family setups and compact layouts.</p> <p>This study highlights the role of changing socio-cultural norms, including the transition from joint to nuclear families, aspirations for social mobility, and the influence of urban lifestyles on housing design. Additionally, it examines how modern construction methods are replacing traditional materials and techniques due to economic pressures, yet some cultural elements like <i>vastu shastra</i> and religious spaces persist. Environmental considerations, including the challenge of adapting modern housing to the region's hot climate, are also discussed.</p>

INTRODUCTION

Lakkundi, often referred to as a temple town, was once an important center of cultural, religious, and economic activity during the reign of the Chalukyas of Kalyani in the 11th and 12th centuries CE. The village is home to a variety of ancient structures, including Jain and Hindu temples, step wells (kalyanis), and inscriptions. However, less attention has been given to the everyday lives of the people who resided there and how their houses reflected their socio-economic status, lifestyle, and cultural values.

In recent decades, urbanization has started to transform Lakkundi, influencing housing styles and patterns. Studying housing in Lakkundi, therefore, provides insights not only into the architectural traditions of a historical society but also into the socio-cultural transitions and continuities in response to modern needs and influences architecture.

Historical Overview of Housing in Lakkundi

Early Housing Structures

During the Chalukyan period (10th-12th century CE), Lakkundi was a flourishing town with a dense population. While religious and public structures have survived in greater numbers, remnants of residential buildings provide valuable insights into early housing patterns. Historical housing structures in Lakkundi were closely aligned with the socio-economic status of the inhabitants, with distinctions in size, materials, and architectural details.

Houses of the elite were often built using stone, reflecting their permanence and social standing, while the common people primarily used mud, bricks, and timber for construction. The presence of stepwells or kalyanis near residential areas suggests that water played a crucial role in determining settlement patterns.

Traditional Housing Layouts

The traditional housing in Lakkundi, much like in other parts of medieval South India, followed a courtyard-based design. This layout centered around an open space within the house, which facilitated air circulation, natural light, and privacy. The central courtyard was often surrounded by rooms on all sides, with a front verandah (pillared porch) that opened towards the street. This not only provided a transition from the public to the private space but also served as an area for social interaction and relaxation.

The houses were typically single-storey with sloping roofs to manage the tropical monsoon rains. The roof tiles were locally made from terracotta, which provided insulation from the heat.

Materials and Techniques

Historically, the materials used for housing in Lakkundi included locally available stone, mud, timber, and terracotta tiles. Stone was primarily used for the foundations, plinths, and sometimes for the walls in wealthier households. Mud mortar, sun-dried bricks, and timber were the principal materials used for

constructing the walls of common houses. The use of organic materials like cow dung and lime in plastering added to the aesthetic appeal and longevity of the structures.

Skilled craftsmanship was evident in the carved wooden pillars and beams found in traditional houses. These carvings often depicted religious or mythological motifs, demonstrating the cultural significance of such designs.

Traditional Housing in Lakkundi: Materials and Construction Techniques

The traditional housing in Lakkundi is a reflection of the region's cultural values, environmental conditions, and the availability of local resources. The architectural approach to residential construction was practical and sustainable, with an emphasis on natural materials, techniques developed over centuries, and sensitivity to the local climate. The following is an in-depth look at the materials and construction techniques that characterized traditional housing in Lakkundi.

1. Key Building Materials

Traditional homes in Lakkundi were constructed with locally available materials that were abundant, affordable, and eco-friendly. The choice of materials reflected the geographical and economic context of the region.

a) Stone

Stone was the most prominent material used in constructing homes of the elite and wealthy in Lakkundi. The Western Chalukyan period, which saw the peak of Lakkundi's prosperity, left behind remarkable temple architecture, and similar craftsmanship extended to some of the more affluent households. Houses built with stone walls were durable, long-lasting, and resistant to the wear and tear of harsh weather conditions. Stones were typically sourced from nearby quarries, minimizing transportation and costs.

Granite and Sandstone: These were the most common varieties of stone used, as they were strong, readily available, and could withstand the local climate.

Stone Foundations: In many cases, houses that were otherwise built with mud or timber had stone foundations, providing stability to the structure.

b) Mud and Clay

Mud and clay were primary construction materials for the majority of houses in Lakkundi, particularly for those belonging to the lower or middle economic classes. Mud houses were cost-effective, thermally efficient, and well-suited to the environment.

Mud Walls: Walls made of compressed mud were typically thick and provided excellent insulation. During the hot summers, the interiors of these houses remained cool, and in the winter, they retained warmth.

This natural temperature regulation reduced the need for artificial heating and cooling.

Cob Construction: A common method in Lakkundi was the cob technique, where mud was mixed with straw and small stones to form dense, load-bearing walls. This mixture made the walls more durable and resistant to cracking.

Mud Mortar: For stone or brick houses, mud mortar was used as a bonding agent. It was locally sourced, inexpensive, and allowed for the natural expansion and contraction of walls during changes in temperature and humidity.

c) Timber

Timber played a crucial role in the construction of traditional homes in Lakkundi, especially for roof structures, columns, and beams. Timber was sourced from local forests, making it easily accessible.

Roofing Beams and Rafters: The roof structure was supported by wooden beams and rafters, which were essential for maintaining the integrity of the sloping roof design. The flexibility of timber allowed the roof to withstand the region's monsoon winds.

Wooden Columns and Verandahs: Wealthier homes featured intricately carved wooden columns, particularly in the verandahs and central courtyards. These columns often showcased religious and cultural motifs, highlighting the artisanship of the region.

d) Terracotta Tiles

Roofing in traditional homes commonly used terracotta tiles. These tiles were made by locally available clay, fired in kilns, and shaped into distinctive interlocking forms.

Sloping Terracotta Roofs: The sloping roof design made with terracotta tiles was particularly effective in draining rainwater during the heavy monsoon seasons. This design also provided a cooling effect, as the air trapped between the tiles acted as an insulating layer.

Local Production: Terracotta tiles were often produced within or near the village, making them accessible and affordable for most residents.

e) Lime Plaster and Organic Finishes

Traditional homes in Lakkundi frequently utilized lime plaster mixed with organic materials like cow dung or crushed shells. This technique not only enhanced the durability of the walls but also gave the houses a smooth finish.

Lime Plaster: The lime plaster was applied to both the interior and exterior of mud or brick walls to protect them from erosion due to rainfall and to increase their longevity.

Organic Additives: The addition of materials like cow dung provided antibacterial properties, which helped in

maintaining hygiene within the home. It also had waterproofing and insect-repellent qualities.



2. Construction Techniques

The construction techniques employed in traditional housing in Lakkundi were developed through generations of experience and a deep understanding of the local climate and materials. These techniques were designed to ensure that homes were durable, comfortable, and suited to the region's environment.

a) Load-Bearing Walls

Most traditional houses in Lakkundi used load-bearing wall construction, where the thick walls made of mud, stone, or brick bore the weight of the structure. The load-bearing walls were often around 18 to 24 inches thick, providing stability as well as excellent thermal mass, which helped regulate indoor temperatures.

Mud Reinforcement: In mud construction, reinforcing the walls with bamboo or timber mesh was common. This reinforcement increased the strength of the walls and reduced the likelihood of cracks.

Stone Courses: In wealthier homes, a combination of stone and mud courses in the walls increased structural strength and longevity.

b) Courtyard-Centered Architecture

The most defining feature of traditional houses in Lakkundi was their courtyard-based layout, known as "Angan" or central courtyard design. This layout was designed to optimize airflow and natural light within the home, creating a pleasant and practical living space.

Ventilation and Cooling: The courtyard acted as a natural cooling mechanism by promoting cross-ventilation. During the day, the courtyard allowed warm air to escape, while at night, cool air would circulate through the surrounding rooms.

Cultural and Social Space: The courtyard also served a socio-cultural function, acting as the center of domestic life. It was a space for socializing, conducting religious ceremonies, drying crops, or doing household chores like cooking.

c) Sloping Roofs with Overhangs

One of the most essential elements of traditional Lakkundi homes was the sloping roof with wide eaves. The design of the roof played a significant role in protecting the house from heavy monsoon rains.

Overhanging Eaves: These wide overhangs (sometimes extending several feet) protect the exterior walls from the elements, minimizing rain damage and providing shaded areas around the home.

Rainwater Drainage: The sloped design directed rainwater away from the walls and foundation, reducing erosion and moisture accumulation that could weaken the building.

d) Foundation Techniques

Even though some houses were primarily made of mud, their foundations were often built using stone to ensure stability and protect against the seasonal fluctuations in soil moisture. Stone foundations helped elevate the mud walls above ground level, protecting them from moisture during the rainy season.

Raised Plinths: In many homes, the living areas were built on raised plinths to avoid flooding and dampness. This technique was particularly important in Lakkundi, where heavy rains during the monsoon could otherwise cause significant damage to ground-level homes.

e) Natural Cooling and Ventilation

Traditional houses in Lakkundi were designed with an understanding of the region's hot summers and cool winters. The thick walls and high ceilings helped in reducing the temperature inside the house during the day, while the ventilated roof and strategic window placement allowed heat to escape.

Jalis and Openings: Small, perforated windows (jalis) were often used in the walls for ventilation. These openings allowed air to flow through the house while keeping the interiors shaded and cool. They also reduced the entry of direct sunlight, preventing heat buildup inside.



Modern Housing Patterns in Lakkundi

Urbanization and Changing Materials

In recent decades, the housing patterns in Lakkundi have undergone significant changes due to urbanization, modernization, and economic pressures. Traditional materials like mud, timber, and terracotta are increasingly being replaced by modern materials such as concrete, cement, steel, and synthetic tiles. These modern materials, while more durable and cost-effective in some ways, often neglect the environmental and cultural aspects that were central to traditional housing.

Key Shifts in Materials:

Cement and Concrete: Modern houses are predominantly built using cement and concrete, which offer greater durability but can be less suited to the local climate.

Steel: Steel is used for structural support in modern houses, particularly in multi-storey buildings.

Synthetic Roof Tiles: Synthetic tiles have replaced terracotta in many cases, though they do not provide the same level of insulation.

Changes in Layout and Design

The traditional courtyard-centric design has given way to more compact and linear layouts in modern homes. This shift is driven by several factors, including population growth, the rising cost of land, and the need for more efficient use of space. Many houses now follow a multi-storey design, with limited open space. The verandah, once a prominent feature, has also diminished in importance, as privacy and security concerns have grown in modern times.

Multi-Storey Houses: To accommodate growing families and limited space, many houses in Lakkundi have added upper floors, moving away from the single-storey tradition.

Compact Layouts: Modern houses are more likely to feature small, enclosed rooms, lacking the open courtyard that once facilitated airflow and light.

Focus on Privacy: Modern designs prioritize privacy over communal spaces, reflecting a shift in social dynamics.

Socio-Economic Divisions in Modern Housing

Socio-economic disparities remain evident in modern housing patterns. Wealthier families tend to build larger, multi-storey concrete houses with modern amenities, while lower-income families continue to reside in simpler dwellings, often incorporating a mix of traditional and modern materials. These differences highlight the ongoing tension between tradition and modernity, as well as the economic challenges faced by many families in Lakkundi.



Preservation vs. Modernization

While modern housing in Lakkundi reflects broader national trends of urbanization and economic development, there is a growing concern about the preservation of the village's architectural heritage. Traditional houses, many of which are hundreds of years old, are rapidly being replaced or renovated using modern techniques that disregard historical authenticity.

Local authorities and conservationists are grappling with the challenge of balancing the need for modern housing with the desire to preserve Lakkundi's unique architectural identity. While some efforts have been made to restore and protect religious monuments, there is little focus on residential architecture, which is an equally vital part of the village's cultural heritage.

Materials and Construction Techniques in Modern Housing

One of the most visible shifts in Lakkundi's housing is the adoption of modern materials and construction techniques. Traditional houses, built with locally available materials such as mud, stone, and terracotta, have increasingly been replaced by homes made with industrialized materials.

Concrete and Cement

Concrete and cement blocks have become the dominant materials in modern Lakkundi homes. These materials

offer greater durability and faster construction compared to the traditional mud and stone houses. Additionally, cement-based homes are seen as more prestigious and durable, offering better protection against natural elements.

The increased use of reinforced cement concrete (RCC) for structural frameworks is also prominent, especially in multi-storey buildings. RCC is preferred for its strength, ability to support heavier loads, and resistance to weathering.

Bricks and Steel

Burnt bricks are replacing traditional mud bricks. While mud bricks were sustainable and locally produced, burnt bricks offer greater strength and are more widely available through industrial manufacturing processes.

Steel is now widely used in roofing and support structures, replacing the traditional wooden beams. This ensures better resistance to termites and other pests, as well as increased structural stability.

Pre-fabricated and Industrial Materials

There is also a rise in the use of pre-fabricated components like doors, windows, and grills, reflecting the move toward industrialization in construction. These materials are easy to install and reduce construction time.

Architectural Features of Modern Housing

The architectural design of modern homes in Lakkundi reflects a departure from the traditional styles that prioritized communal living and climate-sensitive layouts.

Compact Layouts and Multi-storey Buildings

Smaller floor plans: The shift from joint families to nuclear families has significantly influenced the layout of modern homes. Homes are now built for smaller family units, leading to more compact designs. While traditional homes featured large open courtyards and expansive shared spaces, modern homes focus on maximizing indoor living space with smaller rooms.

Multi-storey buildings: The scarcity of land and increasing population pressure have resulted in a trend toward building two or even three-storey homes. These homes allow for more functional use of limited land area while providing additional space for growing families.

Functional Spaces

Separate bedrooms and bathrooms: Unlike the shared, communal spaces in traditional homes, modern homes feature separate bedrooms, each with attached bathrooms. This reflects the desire for increased privacy and the influence of urban living standards.

Modern kitchens: Kitchens in modern homes are now fully enclosed and equipped with modern amenities

such as gas stoves, refrigerators, and water purifiers. This marks a significant departure from the semi-outdoor kitchens of traditional homes.

Living rooms: The introduction of formal living rooms, often located at the entrance of the house, is a common feature in modern homes. These spaces are used for receiving guests and serve as the focal point for social gatherings within the family.

Influence of Urbanization and Economic Growth

Lakkundi's modern housing patterns are strongly influenced by urbanization and the socio-economic shifts associated with development.

Urban Aesthetics and Design Influence

As Lakkundi becomes increasingly connected to nearby urban centers like Gadag, residents are exposed to urban housing styles and designs. This has led to the adoption of urban-inspired architecture, characterized by smooth plastered walls, tiled floors, and sleek modern designs.

Flat roofs have become more common, moving away from the sloping terracotta roofs of the past. These roofs are often functional, allowing for additional storage or future expansion of the house.



Improved Infrastructure and Modern Amenities

Electricity and plumbing: Modern homes are fully equipped with reliable electricity, water supply, and indoor plumbing, which were not as prevalent in traditional homes. This has transformed daily living by improving sanitation, convenience, and overall quality of life.

Modern bathrooms: Most new homes now have attached bathrooms with running water, Western-style toilets, and modern fixtures, a stark contrast to the detached and communal bathroom areas of older houses.

Appliances and technology: The use of household appliances such as refrigerators, washing machines, air conditioners, and televisions has become more widespread, further reflecting the urban influence and increasing economic prosperity of some Lakkundi residents.

References

1. Michell, G. (1995). *Architecture and Art of Southern India: Vijayanagara and the Successor States*. Cambridge University Press.
2. Deva, K. (1990). *Temples of Karnataka*. Aryan Books International.
3. Dhavalikar, M. K. (1999). *Masterpieces of Indian Terracotta Architecture*. Oxford University Press.
4. Dandekar, H. C. (1986). *Shelter, Settlement, and Development*. Allen & Unwin.
5. Gupta, N. (2007). *Cultural Heritage and Local Identity in Rural India*. Sage Publications.
6. Kanekar, S. (2008). *Vernacular Architecture of India*. Orient BlackSwan.
7. Rao, N. (2012). *Traditional Housing in India: A Study of Local Construction Techniques and Materials*. *Journal of Indian Architecture*, 15(3), 45-60.
8. Vijayanagara Research Project. (2014). *Housing and Urban Development in Historical Karnataka Villages*. Indian Council for Historical Research.
9. Kumar, R. (2019). *Contemporary Rural Housing in South India: Modernization and Tradition*. *Indian Architectural Review*, 25(2), 72-90.
10. Sankalia, H. D. (1971). *The Archaeology of Karnataka: Early and Medieval Settlements*. Deccan College.