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CULTURAL AND REGIONAL INFLUENCES ON AESTHETIC AND FUNCTIONAL ARCHITECTURE

Ar.K. Dhiksha

Assistant Professor, Department of Architecture,
School of Architecture and Planning, Anna University, Tamil Nadu, India.

Muppidathi. A

Student, B.Arch Department of Architecture, School of Architecture and Planning ,
Anna University, Tamil Nadu, India

ABSTRACT

The relationship between culture, region, and architecture is a fascinating topic that explores how societies adapt their built environment to reflect their values, beliefs, and heritage. This research delves into the multifacetedconnection between culture and architecture, examining how regional influences, climate, and materials shape the appearance and functionality ofstructures. The study draws on real-life examples from around the world, analyzing the sustainability practices that have been employed in different cultures and regions. By considering the implications for contemporary design, this research aims to uncover the intricate connections between thetangible and intangible elements that come together to create architectural wonders. In today's globalized architecture era, it is crucial to recognize theimportance of local traditions and universal principles that transcend boundaries. This study emphasizes the enduring value of preserving regional identity and cultural heritage in architectural design. Architects, urban planners, and policymakers can benefit greatly from the insights provided by this research, as they strive to create spaces that are not only beautiful but also meaningful and relevant to the communities they serve.

Keywords: Culture, Architecture, Regional influences, Sustainability and Cultural heritage

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CHAPTER 1: INTRODUCTION

1.1. GENERAL

Architecture is a result of human creativity. It is influenced by culture and regional context. The relationship between them affects the appearance andusefulness of buildings worldwide. Every structure, like Gothic cathedrals and Japanese tea houses, reflects its cultural heritage and surroundings. This exploration looks at the relationship between cultural identity, regional landscapes, and space design. We will understand how the artistic expression of a community and the adaptation to local conditions shape architecture. This journey uncovers the universal and unique forces that influence architecture worldwide. It shows how cultural and regional influences impact creating structures that provide shelter and resonate withthe people who live there.

1.2. AIM OF THE STUDY

The primary aim of this study is to investigate and analyze how cultural andregional influences impact the development of architectural styles, with a focus on the aesthetic and functional elements of buildings.

1.3. OBJECTIVE OF THE STUDY

Examine Cultural Influences: Investigate the role of cultural factors, including history, traditions, beliefs, and societal values, in shaping architectural aesthetics and functionality.

Explore Regional Variations: Analyze the impact of regional characteristics such as climate, geography, and available building materialson architectural design and functionality.

Contemporary Relevance: Discuss the relevance of these influences in modern architectural design and how architects draw inspiration from cultural and regional elements to create innovative, functional, and aesthetically pleasing structures.

Preservation and Conservation: Address the challenges and opportunities associated with preserving and conserving architectural heritage influencedby culture and region.

1.4. SCOPE OF THE STUDY

- Investigating diverse cultural identities and their impact on architectural styles, materials, ornamentation, and spatial arrangements. This includes understanding how cultural beliefs, rituals, and traditions manifest in architectural design.
- Analyzing the aesthetic elements in architecture, like ornamentation,decorative motifs, color schemes, and architectural detailing. This includes understanding the symbolic significance of these elements within different cultural contexts.
- Examining the functionality of architectural designs concerning practical needs, including space utilization, climate adaptability, structural stability, and technological innovations. This involves studying how modern technology integrates with traditional architectural practices.

1.5. METHODOLOGY

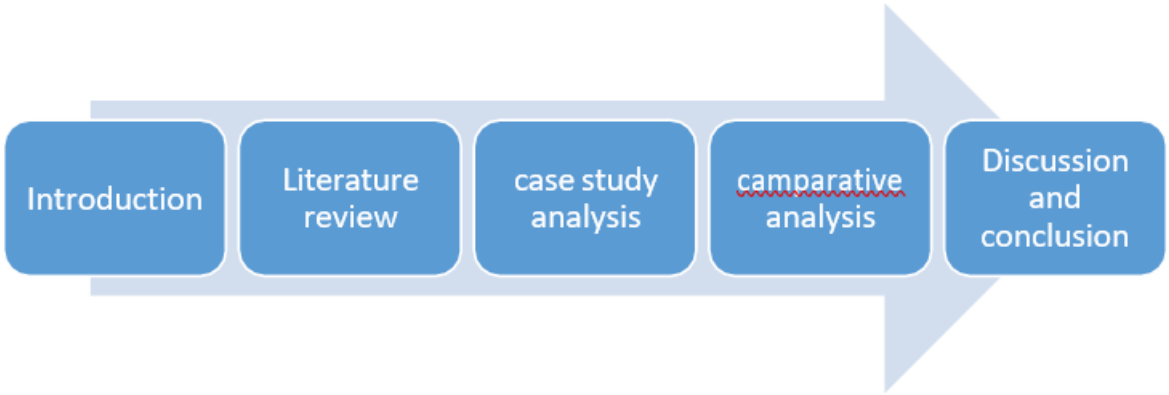


Figure 1 Methodology

Literature review: The literature study about to the basic study of the culture and region and then the characteristics of cultural practices unique identity of each culture. Understanding the cultural beliefs and values to reflect their lives through architecture. And how that particular topographycondition areas is challenging to survive their daily life.

Case study analysis: Choose to the case study into five regions and each region has individually geographical conditions and cultural differences. So we have in each region to choose suitable cultural are regionallyinfluenced by the city or individual culture practice. It is helping to study the construction techniques and how useful toady life for surviving today's world.

Comparative analysis: Compare all the case studies, individual culture andregional influences on architecture. And aesthetic and cultural elements

To understand their regions vernacular architecture to using their own materials and cultural reflects the buildings in a unique way.

Discussion and conclusion: Finish the dissertation by examining the studyfindings of all the analysis to help the cultural values, identity and architecture aesthetic approaches in the building. And the aim of these analyses to use for future generation to know all traditional factors and prevent that factor to resilience our cultural values.

CHAPTER: 2 LITERATURE REVIEW

2.1. CULTURE

Culture is a result of humankind's unique creations. It is one feature of human society that makes it unique. Culture doesn't exist at the subhuman level. Man is only ever discussed or born in a cultural context. Other animalslive in their natural habitat. It is related to say that "every man is born into a society" or "every man is born into a culture." The saying "man could be a social being" may therefore be rephrased to read "man could be a culturalbeing." Every man will be seen as the cultural representative of his own people. Culture is the quality that separates humans from other animals. Theterm "culture" is very broad and includes all of our political, religious, economic, and other activities as well as our lives, behavioral patterns, morals and manners, philosophies and ethics, rituals, and traditions. Cultureis all that man has acquired during his social and personal life. The entiretyof one's "social heritage" is what they inherit from the group.

2.1.1. CHARACTERISTICS OF CULTURE

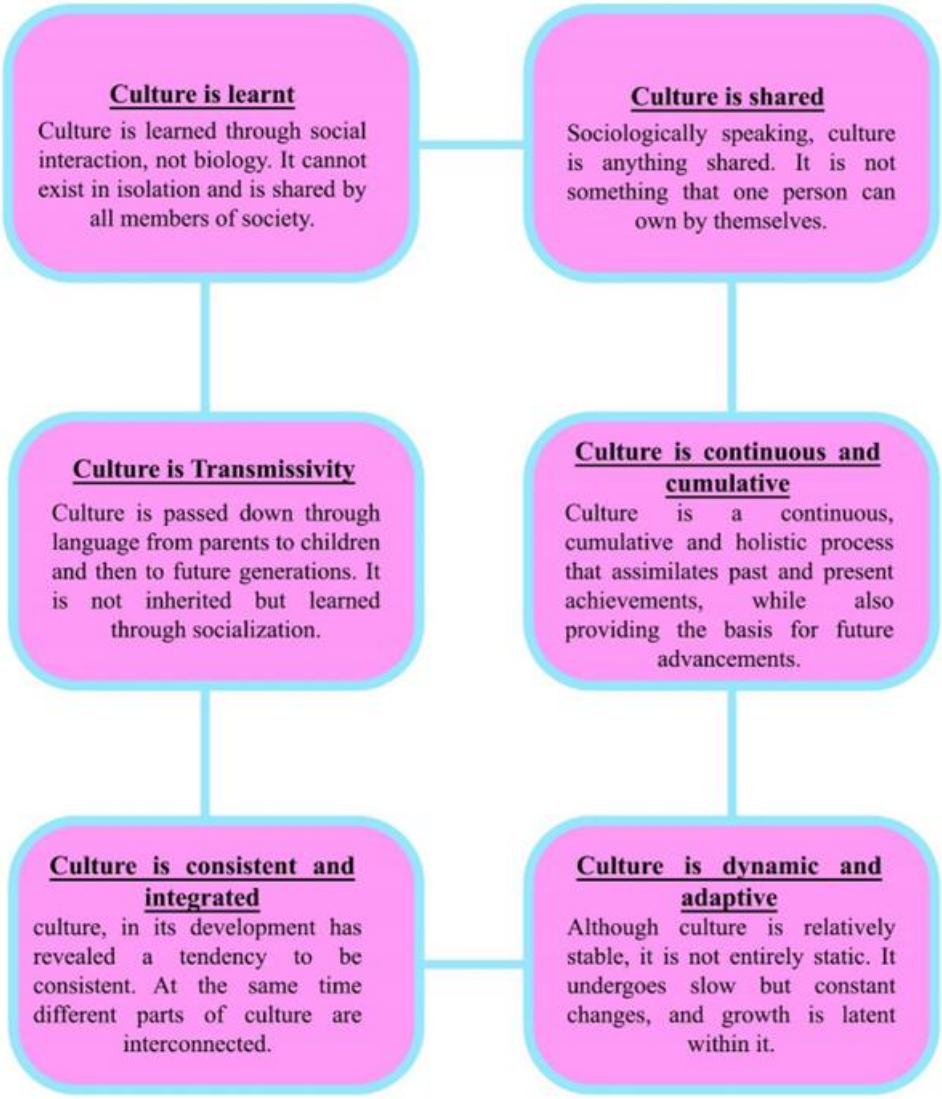


Figure 2 Cultural characteristics

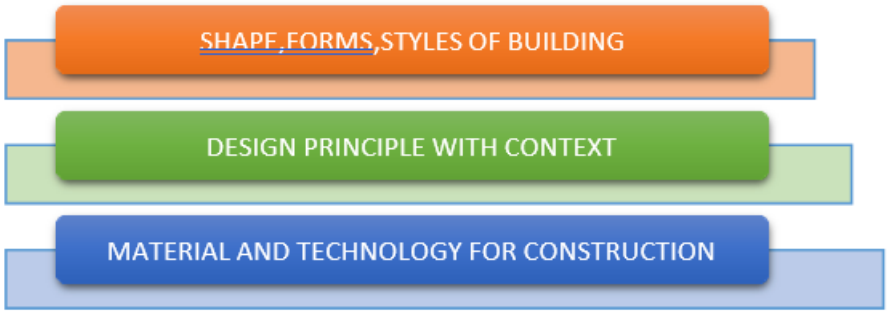


Figure 3 Design factors

2.1.2. CULTURAL IN VARIOUS ASPECTS

Culture is a complex web of many elements that collectively mold a community's identity. Its fundamental beliefs and values serve as fundamental values that affect one's worldview and way of thinking. Socialnorms, or regulations, set standards for behavior and manners within a group. Language, which reflects individual expressions and language the complexity, is an essential medium for communication. Cultural narrativescan be creatively expressed through the visual, performing, and literary artsthrough creativity and expression. A society's cooking identity is influencedby its culinary traditions, which have a strong foundation in its cultural customs. Religious and spiritual beliefs influence customs and ceremonies and interact with cultural identity. Cultural norms establish social structures, including gender roles and family hierarchies, and they can havean impact on education systems by defining what a culture considers to be necessary knowledge. The way that technology and culture interact dynamically is a reflection of adaptive practices. The preservation of customs and historical accounts is included in cultural heritage, which enables communities to stay connected to their history. Recreational activities and entertainment preferences serve as common experienceswithin a community, and clothing trends and fashion choices constitute a visual language reflecting cultural identity. Cultural identity is rooted in personal values and associations, which influences how people view themselves. Cultural practices provide a sense of stability and meaning to life milestones. Essentially, culture is a dynamic phenomenon that continuously transforms into a collective manifestation of a people's identity and history by connecting these different elements.

Figure 4 various aspects of culture

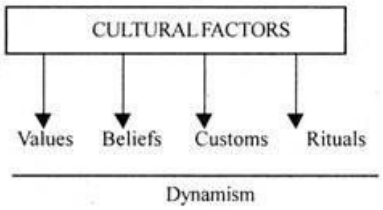


Figure 5 Cultural factors

2.1.3. CULTURE INFLUENCING ARCHITECTURE

Architecture is heavily influenced by culture, as it interacts with various customs, values, and beliefs. This influence is evident in every aspect of architectural design, leaving a unique impression on a building's aesthetics, practicality, and symbolism. It directs the selection of decorations, patterns, and colors, forming the architectural structures' aesthetic appeal. Furthermore, buildings frequently hold deep cultural significance through symbolism, such as the civic importance of government buildings or the sacred architecture of religious structures. The way that space is arranged within structures is determined by culture, which takes into account customs, social conventions, and the requirement for private or public spaces. The selection of building materials is influenced by local resource availability and cultural customs, which affects both sustainability and aesthetics. Climate adaptations that consider cultural sensitivity lead to architectural designs that adapt to their surroundings. Architectural styles vary historically and regionally, demonstrating how cultural influence changes over time and across different geographic locations. Culture thus influences not only the external appearance of buildings but also the fundamental nature of our built environment, linking architecture to the narratives, values, and identities of communities across the globe.

Aesthetic Preferences: Aesthetic preferences and cultural values are important factors that influence how architecture looks. Different architectural styles, ornamentation, and decorative components reflect the diverse opinions held by different cultures about what constitutes beauty.

Symbolism and Meaning: Structures have cultural and symbolic significance. Religious architecture, for instance, is rich in cultural symbolism, whereas government structures could represent a society'svalues and aspirations. Structures can tell stories and transmit cultural messages through their shape, arrangement, and decoration.

Use of Space: The layout and utilization of spaces within structures are influenced by cultural norms and behaviors. Conventional cultural practicesand social mores impact how rooms are arranged, how spaces are set up forparticular purposes, and how meeting places are designed.

Choice of Materials: Cultural customs and resource availability are major factors in the selection of building materials. The utilization of indigenous resources like bamboo, stone, or adobe may be required by cultural customs.The sustainability of the architecture may also be impacted by the materialschosen.

Climate and Environment: Climate and environment specific designs arefrequently tailored to the specifics of a given place. Because climate- appropriate architecture is required, housing designs in arid regions will differ from those in cold, mountainous regions.

Rituals and Practices: Religious or customary rituals and practices are frequently accommodated by cultural architecture. While traditional homesmay have particular elements to support cultural customs, sacred spaces aremade to support religious ceremonies.

Identity and Heritage: The preservation of cultural identity and legacy canbe derived from architecture. It supports cultural continuity and helps preserve a link to the past, especially in the face of globalization.

Technological Adaptation: Customs and cultural values have an impact on how technology is applied to architecture. Some cultures may favor traditional building and design techniques, while others may welcome modern technology.

2.2. REGION

A region is a geographic area that is distinct from its surroundings due to itsunique and shared qualities. These qualities can include various elements such as environmental conditions, political jurisdictions, cultural traits, geographic features, and economic activities. Physical features like deserts,mountains, and coastlines, as well as climate, landforms, and ecosystems, are examples of geographic characteristics that define a region. Cultural regions are defined by shared practices, languages, traditions, culturalhistory, and identity. Political regions are defined by administrative bordersof nations, states, provinces, or local governments. Economic activities andindustries, like agriculture or industry, also serve as boundaries for economic regions.

2.2.1. CHARACTERISTICS OF REGION

A region's characteristics are diverse and might change based on the kind of territory being discussed. Geographical regions are frequently identifiedby common physical characteristics, which include varying topographies, patterns of climate, and natural resources. Common languages, traditions, practices, and religious beliefs bring people from different cultural regionstogether and create cultural identities that unite communities.

Geographical elements: Landforms (plains, mountains), sources of water (rivers, lakes, coastlines), and temperature patterns (desert, tropical, temperate) are examples of the common geographical elements that regionsshare.

Economic Activities: The economic foundation of economic areas isshared. This can include businesses, trade, agriculture, or certain economicendeavors that drive the region's economy.

Environmental Conditions: Particular ecosystems or environmental conditions define environmental regions. These areas might have similar climatic trends, ecological traits, and flora and fauna.

Social and Demographic Patterns: Common social and demographic traits, including population density, age distribution, or income levels, maybe seen in social areas.

Functional Relationships: Usually revolving around a hub or node, functional relationships connect functional regions. For instance, because itis connected to the metropolis both socially and economically, the commuter zone surrounding a large city is a functioning region.

Historical and Cultural value: Certain areas, like the "Rust Belt" in the United States, are linked to the downfall of the manufacturing sector and have historical or cultural value.

Natural Resources: Certain natural resources, such as regions rich in minerals, places used for agriculture, or areas with an abundance of water supplies, can be used to define regions.

Infrastructure and Connectivity: The development of transportation networks, infrastructure, and connectivity to neighboring regions might vary throughout locations.

2.2.2. TYPES OF REGION

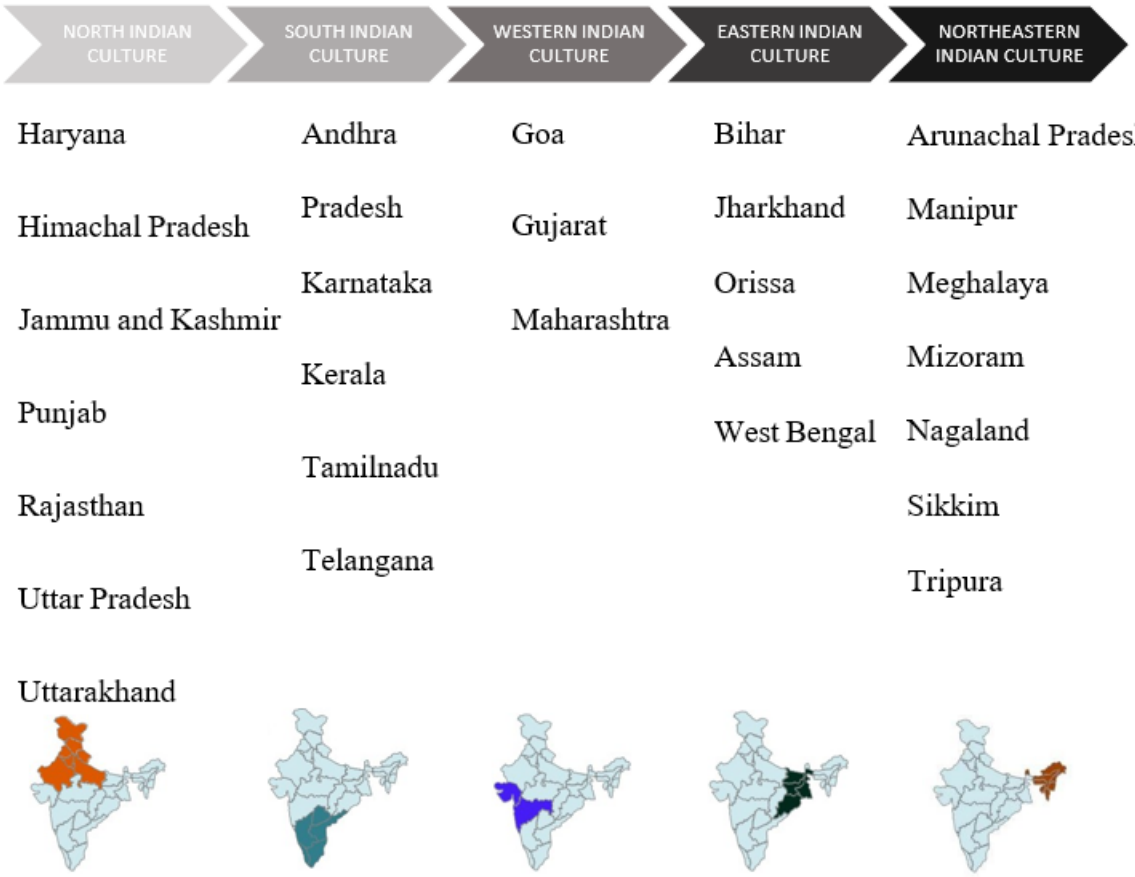


Figure 6 Region maps

CHAPTER 3: EVOLUTION OF ARCHITECTURE

3.2. ARCHITECTURE EVOLUTION IN INDIA AND CASESTUDIES

In India, the intricate cultural legacy of the nation is reflected in the architecture that has evolved over millennia in a tapestry of varied forms. Every historical period has left its permanent imprint on the architectural environment, from the grand Mughal structures to the planned cities of theIndus Valley Civilization. With its distinct fusion of Islamic, Hindu,

Buddhist, Jain, and colonial influences, India has produced a wide range ofarchitectural styles, including elaborately carved temples, magnificent palaces, and striking monuments.

3.2. ARCHITECTURE EVOLUTION IN NORTH INDIA

North India's architectural development is a fascinating historical journey that reflects the influences of numerous dynasties, cultures, and historical periods. This region, which includes states like Delhi, Punjab, Rajasthan, and Uttar Pradesh, has a diverse range of architectural styles, each with a distinct history. North India has had a tremendous evolution in its architectural environment, spanning from the prehistoric age, when the Indus Valley Civilization displayed advanced urban planning, to the medieval era characterized by the grandeur of Mughal architecture, highlighted by renowned structures like the Taj Mahal. Rich palaces and strong forts built by the Rajput emperors added their own special beauty, and the colonial period brought together elements of Indian and Western architecture.

North India, with its modernist designs and environmentally conscious habits, is a harmonious example of tradition and innovation in the modern era. This architectural journey creates a landscape that perfectly blends history and progress, serving as a testimony to the region's rich cultural history.

3.2.1. HIMACHAL PRADESH

Figure 7 Himachal Pradesh

Introduction

Himachal Pradesh, a state in India's Himalayan region, boasts a beautiful blend of art, environment, and culture in its architecture. The architecture exemplifies the strong bond between the people of Himachal Pradesh and their mountainous terrain. Over the centuries, this architectural style has evolved to suit the challenging topography, moderate climate, and unique cultural values of the region. Himachal Pradesh is home to diverse communities, each with its own customs, festivals, and architectural influences that have been influenced by Buddhism, Hinduism, and local beliefs. The state's rough topography and mild climate have given rise to architectural designs that blend perfectly with the natural surroundings. The use of wood in building and steeply pitched roofs to shed snow are examplesof such designs. Traditional wooden homes with intricately carved facades and Buddhist monasteries' monastic buildings are examples of Himachal Pradesh's diverse architectural styles. These structures are not only culturalsymbols but also places of devotion. However, preserving these architectural wonders is crucial to preserving the state's cultural and historical heritage, particularly as the state faces challenges fromurbanization and environmental issues. Himachal's architecture, which blends innovation and tradition, is continually evolving and reflects the region's adaptability and resilience in a rapidly changing world.

Architecture characteristics

Kath-Kuni homes are a type of traditional architecture found in North India's hill country. They are built using native materials, ancient building methods, and cultural aesthetics which combine to create a harmonious structure. The homes have timber components, sloping roofs, exquisite carvings, and dry stone masonry. The stone walls are constructed without mortar and sourced locally. The window frames, beams, and columns provide both artistic detailing and structural stability. The sloping roofs areuseful in draining rain and snow. The interior of the homes is warm and inviting, with low ceilings that are perfect for chilly winters in the area. Elevated plinths protect against moisture and vermin, while thick stone walls provide natural insulation.

Traditional carvings on wooden balconies and windows often feature local deities and folktales, reflecting the rich cultural legacy of the region. Kath-Kuni architecture in the Himalayan foothills is a testament to the intricate relationship between architecture, culture, and environment. It is also a perfect example of sustainable,weather-responsive design.

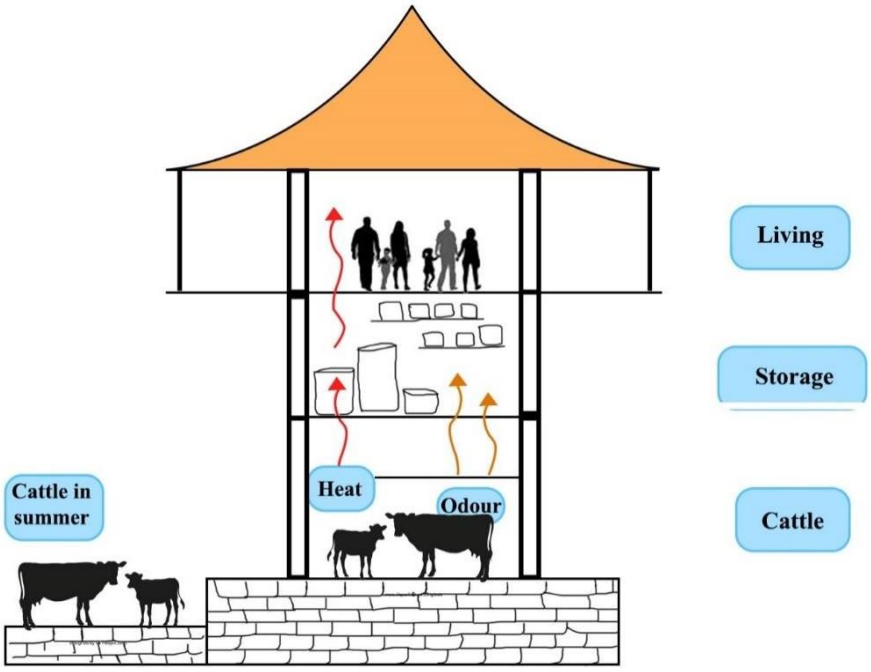


Figure 8 Section of the kath-khuni house

Construction techniques

Kath-Khuni is a popular construction technique in Himachal Pradesh, whichcan be technically referred to as 'Cator and Cribbage'. It is the most elaborate timber earthquake technique. The technique has been in use for about a thousand years and is still used in some remote areas. Local residents cooperate with specialist traditional builders, craftsmen, and masons to build Kath-Khuni houses, which have been a tradition forgenerations. Currently, Kath-khuni building is the most common form of construction in the villages of Himachal Pradesh.

Figure 9 Aerial view of buildings

Kath-khuni building houses are constructed entirely by the members of theLocal community who are well-versed in the spatial organization, audience, Local materials, and traditional construction techniques. This practice has Been carried out over generations, and whenever necessary, new vernacular Built forms are built, and repairs, additions, alterations, and improvementsAre made to the existing ones.

Figure 10 Kath khuni wood structure, gaps to be filled with stone/rubble

The houses in this region are built using two local materials: Himalayanslate and Deodar timber. Himalayan slate is a dark grey stone that is great at absorbing heat and resistant to moisture, while Deodar timber is a type ofmountain cedar that is also resistant to moisture and can adapt to changes in climate and seismic activity. The timber is used to create a floating frame for the building, and is often elaborately carved to add to the building's aesthetic appeal. The slate is used to create the walls and exterior steps of the structure, and is rough cut and layered without any mortar. The construction of kath-khuni follows a system that uses locally available materials that are scalable and adaptable to different sizes. The plinth, or foundation, of a kath-khuni house is made entirely of stone. Two flat layersof stones are placed in parallel to form the foundation of the structural wall, and the gap between them is filled with random debris depending on the size of the stone. Larger stones are placed on the corners and outer edge of the wall to create stability, and additional stones can be added at the base ofthe building for even greater stability.

Figure 11 Elevation

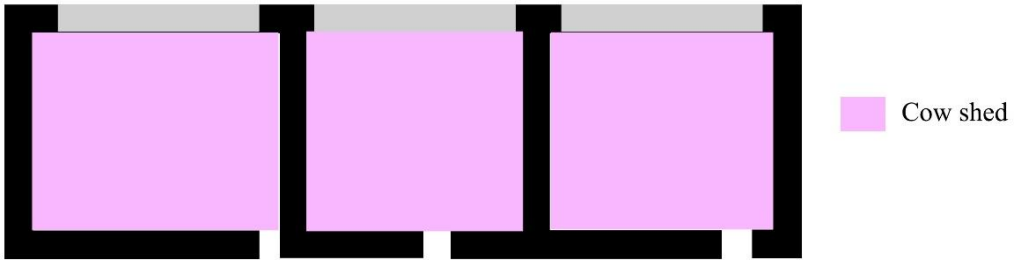


Figure 12 Ground floor Plan

Figure 13 First floor plan

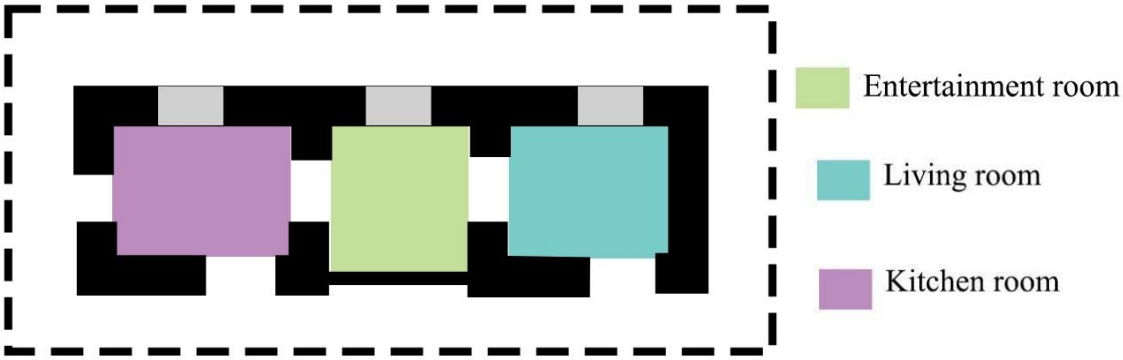


Figure 14 Second floor plan

3.2.2. RAJASTHAN (JODHPUR CITY)

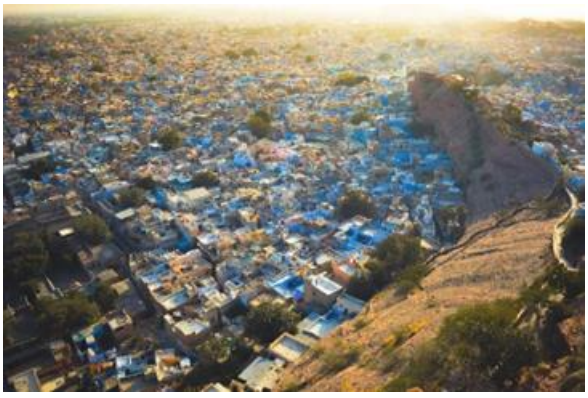


Figure 15 Jodhpur

Introduction

Jodhpur, also known as the "Blue City" of Rajasthan, has a rich and dynamicarchitectural history that reflects the cultural, historical, and environmentalchanges that have taken place in this great city. The name "Blue City" comes from the city's distinctive blue-painted structures, which are an iconic feature of Jodhpur's architectural identity.

The evolution of Jodhpur's architectural style is an intriguing historical experience that exhibits the combination of opulent beauty and functional utility. The Mehrangarh Fort,situated on rocky outcrops, and an intricate façade covered with amazing jali screens and sculptures define the city's unique architectural environment. The fascinating history of Jodhpur's long-standing architectural tradition is reflected in its architectural advancement. It is a dynamic interaction of history, climate adaptability, and cultural resonance rather than just a static exhibition of architecture.

Architecture aspects:

Figure 16 Images of Jodhpur images

- **Tradition and Identity:** The blue color has become a symbol of Jodhpur's identity. It sets the city apart from others and creates a unique sense of place. This tradition is passed down through generations and continues to be an essential aspect of Jodhpur's culture.
- **Cultural Significance:** The blue color has cultural and religious significance for the Brahmin community, who are the primary inhabitants of the old City. In Hinduism, blue is associated with LordKrishna, who is often depicted with blue skin. Painting buildings blue is seen as a way to invoke the blessings and protection of Lord Krishna.
- **Cooling Effect:** Jodhpur is located in the Thar Desert, known for itsscorching heat. The blue color is believed to have a cooling effect onthe buildings. Blue paint, traditionally made from indigo dye, helps to reflect a significant portion of the sunlight and heat, thus keeping the interiors cooler.
- **Insect Repellent:** The indigo-based paint is also believed to have insect-repelling properties, helping to keep the buildings and their inhabitants safe from pests, which is crucial in a desert environment.

3.3. ARCHITECTURE EVOLUTION IN SOUTH INDIA

South India's architectural development is a fascinating historical voyage characterized by a rich and varied cultural legacy. This area, which includesthe states of Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, and Telangana, is renowned for its distinctive architectural heritage that has developed over thousands of years.

With masterpieces like the ShoreTemple in Mahabalipuram and the Brihadeeswarar Temple in Thanjavur, South India's architectural environment displays the beauty of Dravidian temple architecture, which goes back to ancient times and is typified by perfectly carved stone temples and rock-cut buildings. The Chola dynasty'stemple architecture reached its pinnacle during the middle Ages, when it introduced the famous gopurams and magnificent sculptures.

3.3.1. KARAIKUDI (CHETTINAD HOUSE)

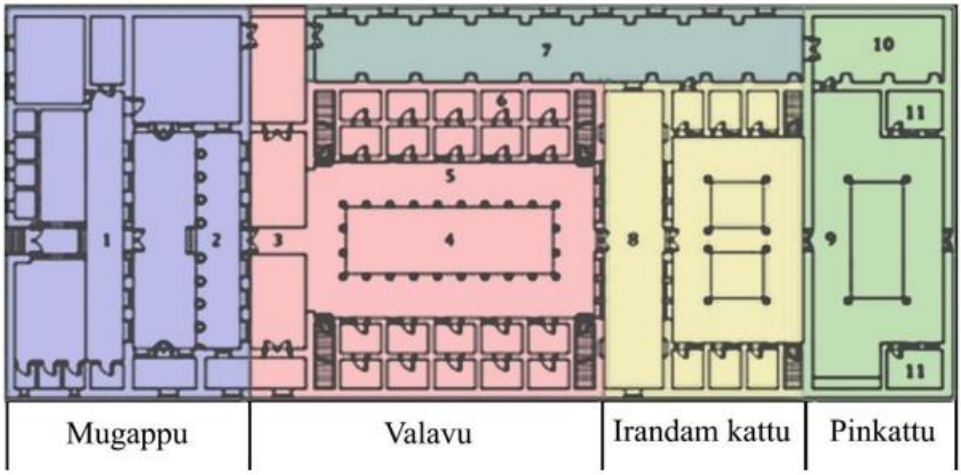
Figure 17 Chettinad house

Introduction

Chettinad district, located in the southern Indian state of Tamil Nadu, is famous for its unique architectural heritage. The area is renowned for its "Chettinad mansions," which are grand, luxurious buildings that offer a fascinating glimpse into the artistic, cultural, and historical legacy of the Chettiar community. These homes are famous for their exceptional design,which includes spacious courtyards, intricately carved wooden pillars, andbeautifully hand-painted tiles adorning the exterior. In addition to being prominent bankers and traders during the late 19th and early 20th centuries,these homes bear witness to the affluent history of the community.

The blend of South Indian, Dravidian, colonial, and East Asian architectural styles in Chettinad mansions reflects the richness and cultural influence of the Chettiars. Each mansion tells a story of opulence, creativity, and aprofound cultural legacy that continues to inspire people today.

Architecture characteristics



1-Mugappu
2- Thinnai
3- Pattagasalai
4- Nadu vaasal
5- Colonnade
6- Rettaiarai
7-Bhojan salai
8-Irandamkattu
9-Pinkattu
10-Ukraanam
11-Adupadi

Figure 18 Plan

Figure 19 Courtyard

Limited access to women

Ceremonial space

Dining space

Designated for women who managed the house hold,maintained the children

Utility courtyard

The first Chettinad houses were one-storystructures composed of sun-dried mud, bamboo, and thatch bricks. They gradually developed into two-story buildings both vertically and horizontally, including multiple halls and courtyards to hold people for weddings and other festivities. Eventually, they became tile- roofed and had a modest two-story tower at each end of the front elevation.Living in one residence with three generations of family members was not rare.

The front door of each house opens into the first street, while the back dooropens into the second. The dwellings are situated on a rectangular traversingplot that spans two streets. Upon entering over the main threshold, your attention moves straight ahead, across a succession of inner courtyards thateach have a dwindling rectangle of light before emerging at the back door. The rest of the home is left in cool, deep shadow by the courtyards, which provide a lot of natural light and air. To prevent damage to the stone floor,tiles in the courtyards are precisely positioned beneath the storm-water drainpipes. The house is filled with underground drains that have stone stoppers shaped precisely like their mouths. The interior courtyards are lined with large stone vats for water and wooden bins for firewood.

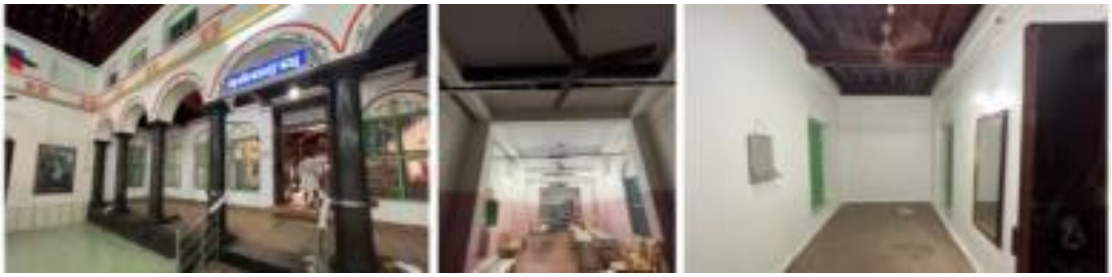


Figure 20 Interior images

The house starts with raised platforms called 'thinnai' on both sides of the central corridor where male guests are entertained. On one side, there are storage rooms and big granaries, and on the other side, the Accountant's room ('Kanakupillai') and often the men's well. The grand teak front door, elaborately carved with Lakshmi's image and nine precious gems under the threshold ('Vasapadi'), leads to the first courtyard. Pillared corridors here lead to rooms meant for married sons, each with a triangular slot for eveninglamps. Then, there's a second courtyard with large dining spaces on both sides. The third courtyard was for women to relax and chat, while the fourtharea ('nalankattai') held the kitchens, leading to the backyard with a women's well and grinding stones. Wealthier merchants often had larger houses that might even have a second floor.

Figure 21 Interior views

Architecture elements

Roofscape: In Chettinad, roofs play a vital role in collecting rainwater andoffering natural cooling. Houses are arranged in rectangular plots along theEast/West and North/South axes, forming successive courtyards. The distinct roofscape of Chettinad arises from the hierarchy of pavilionsfeaturing sloping and terrace roofs.

Figure 22 Roofscape

Arches: The main roads through the villages in the Chettinad region are decorated with a series of graceful arches that define the agricultural scenery. Additionally, every home has a commanding front porch that sits just above the compound wall, displaying the owner's social standing and riches. The essence of Chettinad heritage identity is captured in these elaborately decorated porches that display influences from a variety of architectural styles.

Figure 23 Arches in the entrance of the house

Columns: The main or kitchen courtyards are supported by stone pillars, while interior spaces are primarily furnished with wooden columns. Granitepillars were then used for the outside thinnai. Chettinad is known for its beautiful wooden columns with a unique form.

Figure 24 Columns

Construction techniques

Most of the furnishings, ornamental objects, and building materials were brought from Europe and East Asian nations. Wall-to-wall mirrors from Belgium, chandeliers and teak from Burma, crockery from Indonesia, and marble from Italy were all brought in. The masonry and woodwork were influenced by the construction methods used in French and other European homes. The huge, beautifully carved teak front door, which has ninepriceless stones placed inside the entrance (Vasapadi) and a picture of Lakshmi etched over the head.

The residences were designed for married sons and had pillaredpassageways running down each side that led to separate spaces with a triangular opening in the wall for the night light. Generous dining areas onboth sides. The ladies used the third courtyard as a place to relax and chat, and the kitchens were located in the fourth courtyard, ornalankattai.

The evolution of an entire way of life, including culture, history, material use, new technology, and environmental awareness Establishment Dark green paint has been applied to a large number of windows, some of whichhave orange segment-shaped fanlights over them, or barred and grilled doors with punctured screen ventilators on top.

3.3.2. KERALA

Introduction

Figure 25 Kerala

Vaastushastra is followed in the construction of the majority of Kerala's traditional buildings, including homes. The four types of vernacular residential forms found in Kerala can be explained by spatial and structuralfactors. These include the rectangular I-shaped shelters used by tribal people, rectangular single-hall buildings (Ekashala) with grain storage(Ara), traditional courtyard houses (Nalukettu), and Ekashalas with courtyard-like extensions.

Rectangular hall I shape shelter:

In Kerala, this is the most prevalent style of vernacular house construction. Repetition, extension, and expansion change this sort of thing. There are two zones in the house: the inner zone and the outer zone. The private areas are located in the inner zone, while the outside zone typically include a porch and a seating area.

Figure 26 I shape shelter house

Rectangular single hall building

The granary (Ara) comes as the most important addition in this typology. These homes are sometimes built as an addition to the original house. The main zoning consists of a veranda that occupies the outer zone and an innercore with a kitchen, granary (Ara), and other function rooms.

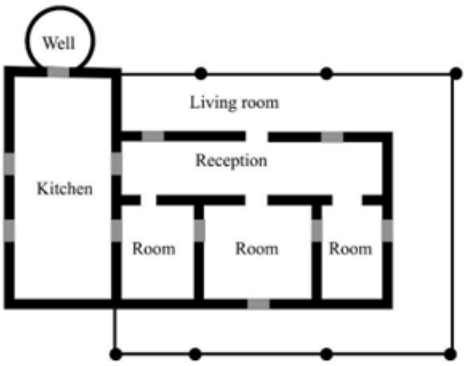


Figure 27 Single hall building plan

Traditional courtyard house (Nalukettu)

The fundamental design of a Kerala courtyard house, or Nalukettu, consists of four blocks enclosing an open courtyard. It can have a square or rectangular floor layout, high pitched roofs, and an open courtyard to let innatural light and air. Both the exterior and interior verandas provide shade from the sun and rain.

The measurements, sizes, and proportions guidelines determine how the blocks and courtyard are arranged. According to the dimensions and significance of the family The materials used to make the eight-block ettukettu and the sixteen-block pathinarukettu are nalukettu elements repeated.

Figure 28 Nalukettu roof

Ekashala with courtyard

The house of this type is a nalukettu variant with a smaller courtyard that doubles as a water cistern. The courtyard serves as a passageway connectingthe annex and the main structure. In order to clearly distinguish between thepublic area, which is the main house, and the private area, which is the annex, there needs to be a transition space.

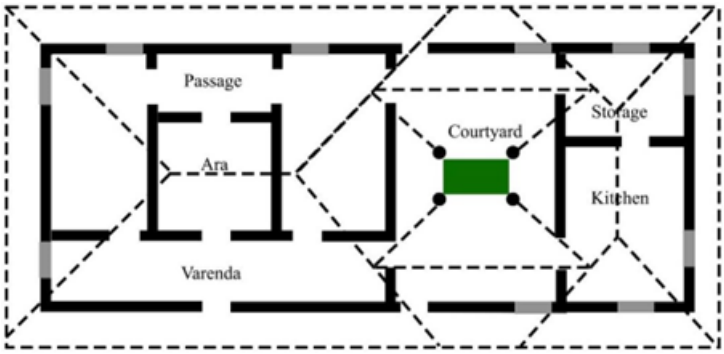


Figure 29 Ekashala with courtyard plan

Materials

The various parts of Kerala use different supplies for construction. However, the main elements are wood, bamboo, clay roof tiles, granite forthe foundations, and laterite stone. The typical Kerala house is a clear example of exposed laterite stone masonry. Since none of these materials require much movement and are easily available locally, they all have limited embodied energy.

Figure 30 Exposed stone masonry

Building envelope

Wall: External walls are constructed using rough-surfaced exposed lateritebricks because they self-shade, lowering the amount of radiation that strikesthem. By using two layers of laterite masonry with a sand-filled void in between, the external wall's thermal mass is enhanced and the interiors arebetter insulated. This will contribute to a decrease in cooling loads. White or other light colors are painted on facades to reduce heat absorption.

Figure 31 Attic space

Roof: To maximize pressure different, which in turn will maximize air flow, high pitched roofs and broad roof overhangs are utilized.

The pitchedroof has a roof below, forming a large attic-like space that works as an insulating barrier to prevent heat from the outside from transferring throughthe roof. There are openings in this air space, which allows hot air to escapeand go down the tiled roof. The second roof continues to be colder than thepitched roof above as a result. Since one of the main concerns is heavy rains,the steep roof and deep eaves aid in the discharge of rainwater.

Figure 32 Top lighting using roof tiles

Fenestration:

There are fenestrations on opposing walls of a typical nalukettu, which improves cross ventilation. There are several types of fenestrations used,from hardwood to standard casement windows with two panels.

The carefully placed wooden jaalis reduce glare, let in diffused light, andenhance airflow.

Figure 33 wooden jaalis

The little wind outside is enhanced by these tiny holes, which speed up theair that moves through them. It permits air to enter more deeply, which is crucial for thermal comfort in Kerala's warm, humid climate. Because theyrestrict direct radiation, they also lessen solar heat gain.

Aesthetic Elements:

Sloping Roof (Gabled Roof): Kerala houses typically have sloping roofs with gables. These roofs are often covered with red clay tiles. The roof design not only adds to the aesthetics but also helps in rainwater harvesting. **Wooden Architecture:** Elaborate woodwork is a key aesthetic feature. Wooden carvings and details can be found on windows, doors, ceilings, and pillars. These carvings often depict traditional motifs, mythological stories, and religious symbols.

Courtyards: Kerala houses often have inner courtyards or "nadumuttam."These open spaces are surrounded by the house and serve as a center for family gatherings, rituals, and relaxation.

Teak Wood Furniture: Teak wood, a highly durable and aesthetically pleasing material, is commonly used for furniture in Kerala homes. Traditional wooden swings called "oonjal" are a characteristic feature.

Vibrant Wall Paintings: Murals and wall paintings are frequently found in Kerala homes, depicting scenes from Hindu mythology, nature, and folklore.

Thatched Roofs (in some rural areas): In rural Kerala, thatched roofs arestill used, especially in older homes. They offer a traditional and rustic aesthetic.

Use of Natural Materials: The use of natural materials such as wood, laterite stone, clay tiles, and bamboo enhances the aesthetics while being eco-friendly.

Verandas (Charupadi): Houses often have verandas or "charupadi" with wooden columns and railings. These serve as areas for relaxation and enjoying the view.

Functional Elements:

Cross-Ventilation: Kerala's hot and humid climate necessitates excellent ventilation. High ceilings, large windows, and jalousie-style window designs promote cross-ventilation and cooling.

Central Courtyard: The central courtyard, along with an open structure, allows for natural light and ventilation, helping maintain a comfortable temperature inside the house.

Elevated Plinth: Many traditional Kerala houses are built on an elevated plinth, providing protection against flooding during the monsoon season.

Kitchen Design: The kitchen, known as the "aduppu," is typically located separately from the main house to reduce the risk of fire and heat. Open cooking areas help in smoke ventilation.

Rainwater Harvesting: Roofs are designed to channel rainwater into wells or tanks for household use. Rainwater harvesting is a traditional and sustainable practice.

Vastu Shastra: Many Kerala houses are designed following the principlesof Vastu Shastra, an ancient architectural system, to ensure harmony and positive energy flow within the home.

Thick Laterite Stone Walls: Thick walls made of laterite stone help regulate temperature and maintain a cool interior during hot weather.

Storage and Cupboards: Kerala homes often feature built-in storage and cupboards, utilizing space efficiently.

3.4. ARCHITECTURE EVOLUTION IN WESTERN INDIA

Western India's architectural development has been an enthralling trip that reflects the region's abundant historical and cultural variety. This region, which includes states like Rajasthan, Gujarat, and Maharashtra, has seen a dynamic interaction of different architectural styles and influences over theyears. Amazing cave temples and stepwells, like the Ellora Caves and Rani Ki Vav in Patan, are part of Western India's historic architectural legacy. They feature intricately carved rock faces and clever structural design. Themagnificent Rajput architecture of Rajasthan, which includes soaring forts,elaborate palaces, and vivid murals, was brought about during the medievalperiod. Buildings such as Jaipur's Amber Fort are prime examples of this style. In churches, forts, and other colonial-era structures, European powerslike the Portuguese and British left their colonial effects.

3.4.1. KUTCH REGION (BHUNGA HOUSE)

Figure 34 Kutch

Introduction

Bhungas, distinct to Gujarat's Kutch region, present circular walls and thatched roofs guaranteeing stability in earthquakes and climate adaptability. Utilizing local materials such as clay, bamboo, and timber, these dwellings uphold roofs using dual robust wooden posts along the circular walls, enabling ventilation via lower wooden-framed windows. Theroofs' lower design safeguards walls from direct sunlight and enhances insulation. Thatched roofs rest upon walls supported by spiral frames forming cones. Sustaining the traditional bhunga requires consistent attention, like applying lipai or lime plaster on walls and floors, renewing dried grass on the roof, and adorning exterior walls with vibrant paintings. Internally, intricate mud and mirror work beautify the interiors.

Figure 35 Interior of a traditional thatched roof

What is bhunga?

The bhunga, a traditional architectural design in Kutch, showcases durablecylindrical rooms suitable for desert conditions and seismic resilience. Circular walls and thatched roofs create a refreshing indoor ambiance usingorganic materials such as mud, grass, cow dung, and cane. The foundation is elevated using stone and bamboo, while walls are crafted from mud and floors from cow dung paste. Wooden columns embellish the mud walls withdiverse decorative motifs, complemented by painted doors and windows. Generally, these one-story structures do not include terraces or balconies.

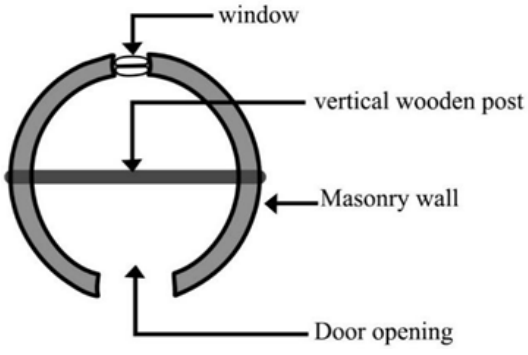


Figure 36 Plan of a typical building

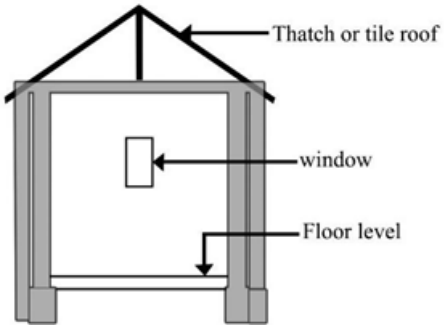


Figure 37 Section

Figure 38 Typical building

Architectural characteristics

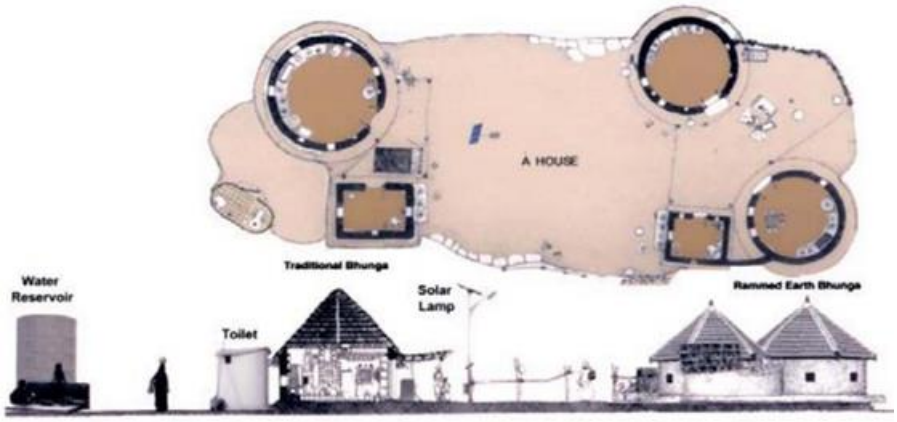


Figure 39 Site plan

The circular mud house is a fantastic example of how exact geometry and material properties are integrated for the climate to create the ideal architectural shape. The house is constructed by the locals using locally sourced materials. The square plan, where the perimeter to enclosed area ratio is higher than in a circular structure, is effectively compared with the circular layout. The house's talent, intelligence, and beauty stem from the generations' combined traditional knowledge, which is used to create intelligently constructed forms.

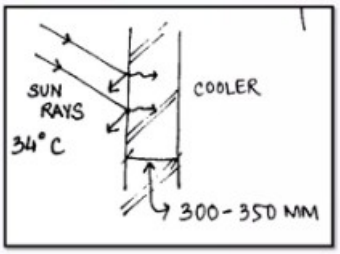


Figure 40 Thick walls for thermal insulation

Because of their near proximity to one another, the platforms provide passageways for traffic. Around the village, thorny shrubs serve as a barrieror defense against the hot winds and dust storms. On entering from the highway, all that is visible are the grass barrier and the rooftops with thatched conical caps against the sky.

Figure 41 Evolution of the elevation of Bhunga

Figure 42 Evolution of the doors of the Bhunga

Traditional Construction Technique

Bhunga is a conical-roofed, round, handcrafted building made of local materials. Bhunga's walls are strengthened with bamboo sticks or branchesand composed of mud that has been let to dry in the sun. To extend the building's life, a mixture of mud, cow dung, and hay is spread to the roof and walls.

The dry atmosphere of the Kutch region is perfect for this simple yet effective building technique. The strong, effective insulation of the Bhungawalls helps to keep the interior cool even in the hottest summer months.

Because of the conical roof's design, natural airflow helps maintain a comfortable temperature within the Bhungas.

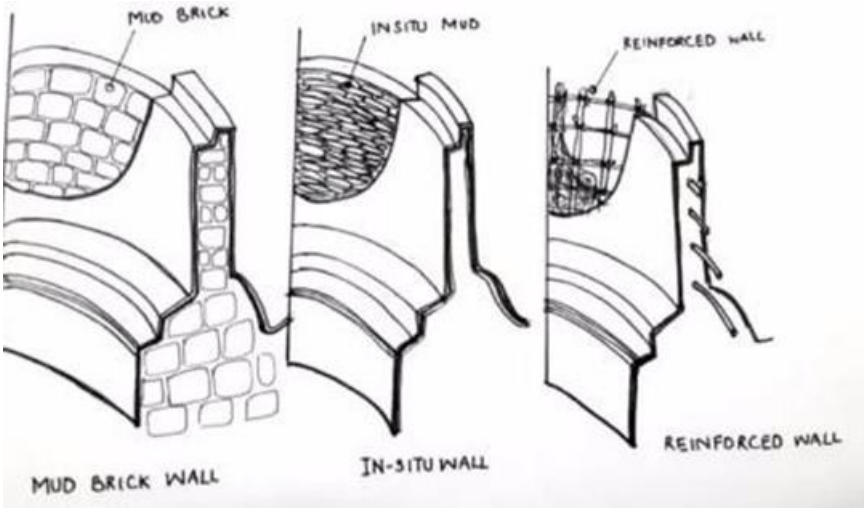


Figure 43 Wall construction

Figure 44 Decorative walls **Figure 45** Reinforced wall

The Bhunga construction method is environmentally beneficial since it useseasily accessible, locally available materials and needs little energy to build.By replacing concrete or steel with bamboo sticks or branches for reinforcement, the building's carbon footprint is reduced.

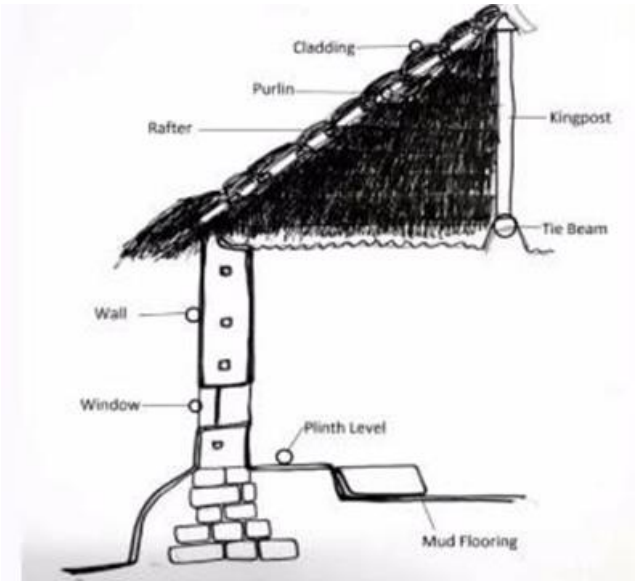


Figure 46 Section of Bhunga

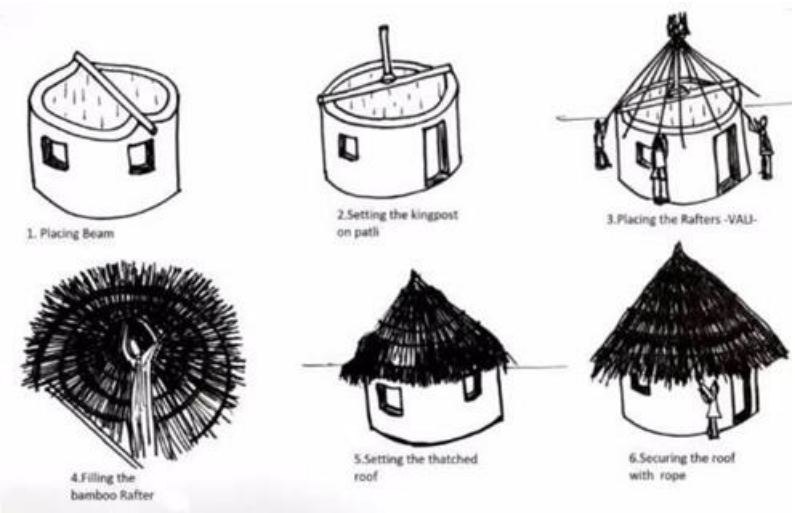


Figure 47 Roof construction

Aesthetic elements

- Bhungas (Circular Mud Huts): Traditional round mud homes with conical thatched roofs are known as bhungas. These cottages have elaborate mud and mirror work on the walls and ceilings, adding a beautiful touch to their utilitarian design.
- Mud and mirror work: Kutchi houses are beautifully decorated with mud and mirror work. This ornamental method uses colored glass, clay, and tiny mirror bits to create elaborate patterns and designs. That characterizes Kutchi architecture.

Functional elements

- Thermal Regulation: The thick mud walls of Bhungas serve as a great means of insulation, keeping the house warm in the winter and cool in the heat of the summer.
- Natural Ventilation and Cooling: Bhungas are made to take full use of natural ventilation and cooling. By allowing air to circulate through the building, ventilation openings contribute to a comfortableatmosphere.
- Courtyards: The central courtyards of Kutch houses facilitate cross-ventilation, natural light, and open space. The courtyard is a useful space for a number of domestic tasks.

3.4.2. NORTH GUJARAT (POL HOUSE)

Figure 48 Pol House

Introduction

Ahmedabad, a historic city, is renowned for its distinctive urban layout encompassing three distinct tiers of community-based settlements: thedistrict "Pur," the sub-district "Pol," and individual residences. Pol houses,a predominant housing style in Ahmedabad for over three centuries, originate from rural settings traceable to North Gujarat's villages.

The ancient district of the city harbors a diverse legacy of settlement layoutsestablished by diverse merchant communities adhering to various religions.Post the communal riots of 1714 and the civil unrest in the 18th century, residences within the city were constructed in close-knit clusters with cul- de-sacs accessible only through a solitary gateway. These clusters, referredto as "Pol," housed inhabitants sharing the same religion, caste, or occupational group. The entry gate to each cluster could be sealed for enhanced security.

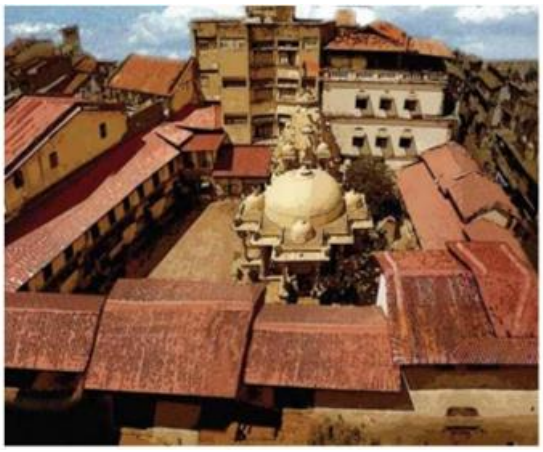


Figure 49 An aerial view of Ahmedabad's Desai-ni-Pol chowk.

During the Mughal-Maratha era (1738–1753) in Ahmedabad, police were established to ensure safety in response to sectarian unrest. At the time, a typical police station would only have one or two entrances, as well as a few doors that were only accessible to the inhabitants. Some of the pols (neighborhoods) have grand historic homes with indoor courts featuring intricately carved wooden facades, painted walls and ceilings, and columns.The development of pol architecture is an intriguing aspect of urban living.The narrow streets allow households to see and communicate with each other, and the interconnecting, meandering streets promote a close-knit community. The urban compact fabric, with shared walls, creates shaded regions that serve as a climate-responsive human habitat, a result of the need for social cohesion and protection. Unlike the gated plots of modern suburbs, pols have a distinct urban sense and a sense of infinite fabric, wherethe mass proportions are practically the same as the open regions.

Figure 50 Typical Pol Street and Inside view

Architecture characteristics

The wood-framed traditional homes seen in Gujarat are a common urban phenomenon. They share shared walls on longer siders and have a small frontage that represents a composite wooden façade. Specified spatialelements.

An empirically developed labyrinth, bonding is the creation of timbers that are extensively articulated within limited settlement patterns called pols. The above characteristics resulted from societal time patterns, caste systems, gender roles, joint family demands, social and religious challenges, as well as structural and climatic limitations.

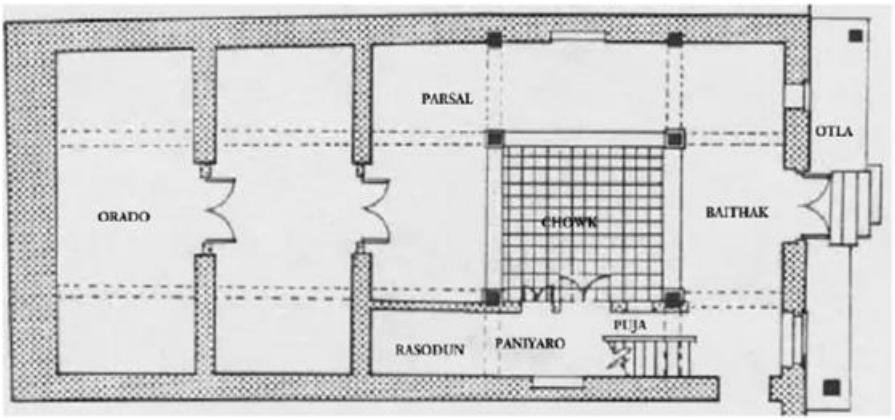


Figure 51 Ground floor plan of pol house

The names given to the main areas of the house did not correspond with their specified purposes. The front veranda, also known as the otla, is a setof steps that define the entry as it lowers from the street to the house level.It serves as a prelude to the largest room, which is the house's threshold.

Figure 52 The paniyaro, puja and the Tanka in chowk

The "Otla," functioning as a communication zone between household occupants and visitors, comprises a sequence of columns sustaining a wooden façade. This façade, tailored to the owner's status, varies in dimensions, intricately carved to impart an ornate and aesthetically pleasingaspect, contributing to the building's impression. The Otla extends into a transitional area primarily serving as a reception space, commonly referredto as a "Baithak" or sitting room. This zone seamlessly links to the central open-to-sky courtyard, known as the "Chowk," serving as a pivotal point interconnecting all spaces within the structure.

Figure 53 The chowk, upla chowk, parsal with orado at the end

Much like the intricate frontal façade, the interior facades encircling the "Chowk" were intricately adorned, harmonizing with the home's central core. The "Rasodun" (kitchen), "Paniyaro" (drinking water storage), and "Puja" (prayer chamber), deemed sacred, were linked to the Chowk. Thus, beyond its essential transitional role, the Chowk epitomized the home's religious epicenter. The "Parsal," the most secluded chamber farthest fromthe street, served as a semi-open space connecting the Chowk to living quarters like "Ordo" or "Ordoo." With small openings facilitating cross ventilation, these areas led to the "Chhindi," a narrow back street, serving both as sleeping quarters and storage spaces.

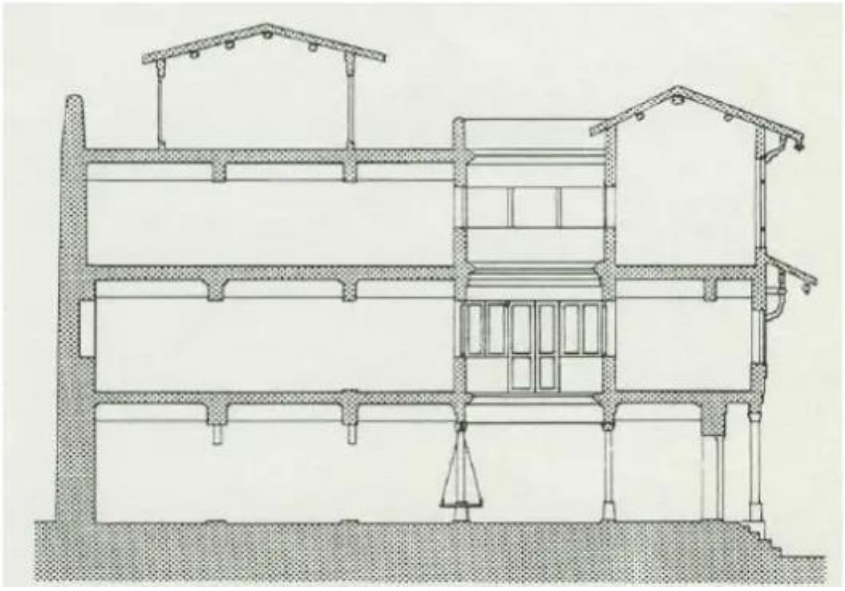


Figure 54 Section of a pol house

Construction techniques:

Pol Houses are identified by their beautifully carved brackets, artistically balconies, and beautiful, detailed wooden façade. Teakwood is a frequentlyutilized material because of its attractive characteristics and durability. Skilled artisans use precision and experience to construct these wooden parts. The focal point of Pol Houses is its center courtyard, which is flankedby rooms and enhanced by charming decorative accents. It is a crucial element for natural ventilation and a place where locals interact. Brick andstone masonry are used to build the walls of Pol Houses, which provide stability and insulation. The walls are frequently coated with lime plaster, which improves the walls' appearance and serves as a barrier against weathering. The elaborate jali work, which makes use of wood or stone lattices or perforated screens, is one of the most remarkable aspects of Pol Houses.

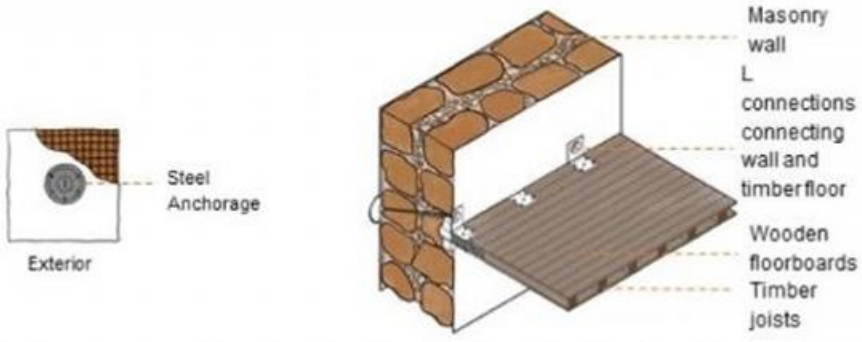


Figure 55 Cross section of the wall

The jali screens enhance the aesthetic and unique character of the house byproviding privacy and allowing air and light filtering. In Pol Houses, glazedceramic tiles are frequently used to decorate the outside, especially aroundbalconies and entrance gates. These tiles are renowned for their vivid hues and elaborate patterns, which give the exterior of the house a touch of elegance and beauty. With their broad eaves, chajjas (projections), and chhapras (thatched roofs) offering shade and protection from the sun and rainstorms, Pol Houses are built to resist the harsh climate of the area. These characteristics improve the house's aesthetic appeal in addition to providingprotection.

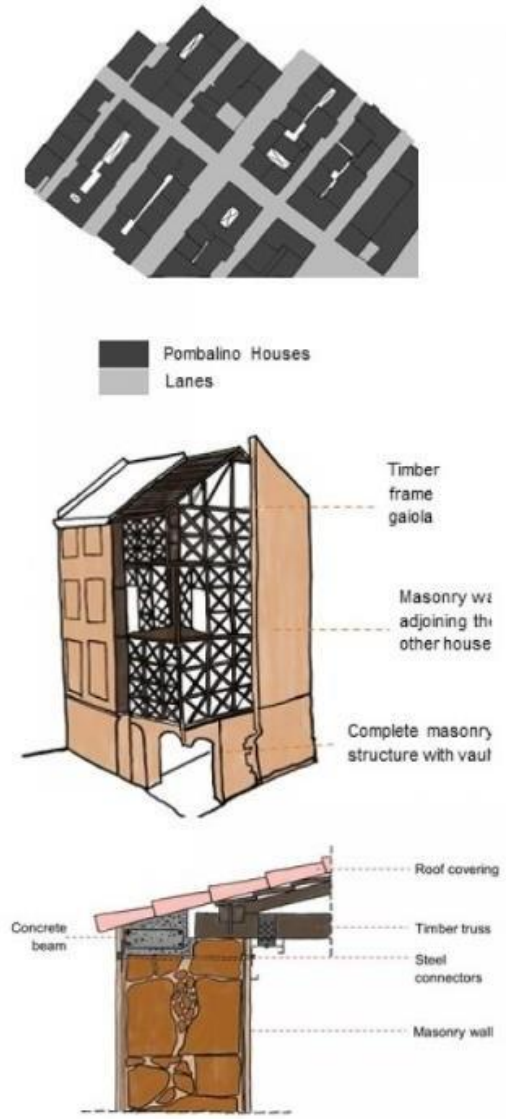


Figure 56 Material used in pol house

The narrow and winding alleyways of the Pol areas are another feature thatadds to the beauty of these houses. They provide effective shading and natural cooling, creating a sense of community among residents by encouraging interactions. The construction of Pol Houses involves the expertise of local craftsmen and artisans skilled in various crafts, including woodcarving, stone masonry, and tile work. These craftsmen play a crucial role in preserving the traditional techniques, which have been passed downfrom generation to generation. Lastly, Pol Houses are built with the environment in mind, adapting to the local environmental conditions, suchas high temperatures, monsoons, and seismic activity. This ensures that the house is not only aesthetically pleasing but also practical and functional.

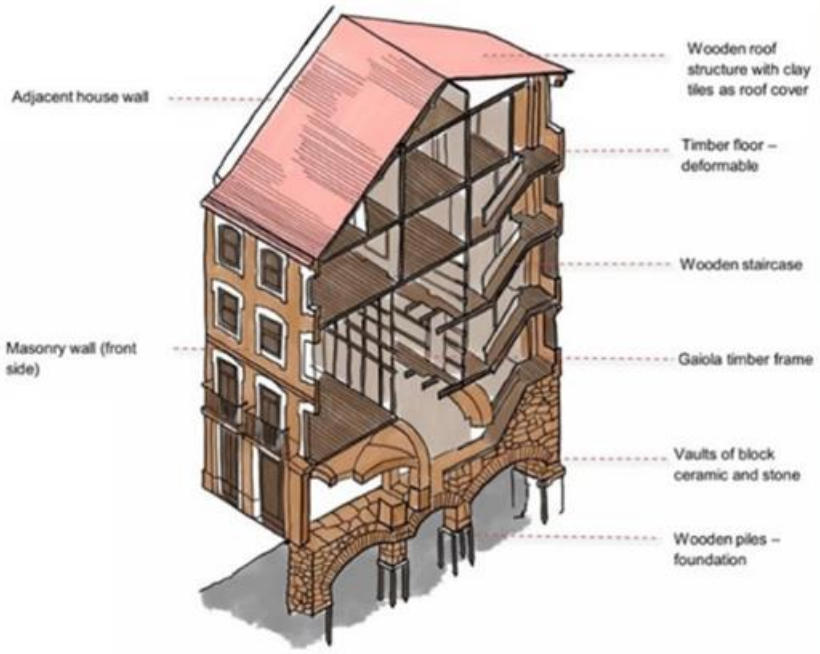


Figure 57 Detail section of pol house

Aesthetic elements:

Wooden Facades: Pol houses are characterized by their elaborately carved wooden facades, also referred to as "jailis" or "chabutras." These wooden components are beautifully crafted and serve practical as well as aesthetic functions by offering shade, seclusion, and ventilation.

Courtyards: Pol dwellings are arranged around "chowks," or center courtyards. These outdoor courtyards let in plenty of natural light and ventilation. Plants, fountains, and ornamental tiles are frequently used to embellish them.

Decorative and ornate entrances with elaborate carvings and patterns are a common feature of Pol homes. The homeowner's taste in design and socialstanding are reflected in these doorways.

Bright Wall Paintings: Bright murals and frescoes are frequently used to adorn the exterior and interior walls of pol residences. These paintings give the homes a distinct appeal while illustrating a variety of subjects, such as religious and mythical tales.

Customized Tiles: "Kavach," a type of traditional hand-painted ceramic tile,is used in Pol homes. These tiles have elaborate designs and brilliant colors,and they are utilized for wall cladding as well as flooring.

Functional elements

Ventilation and Passive Cooling: Pol homes are built to take full advantageof passive cooling and natural ventilation. Cool air flows through the housethrough the wooden jaalis, open courtyards, and well-placed windows, keeping the house cool even in the hot weather.

Rainwater Harvesting: To ensure a sustainable water source, many modernresidences are equipped with rainwater harvesting systems. These systemsinvolve designing rooftops to direct rainwater into subterranean storage tanks.

Security and Privacy: The wooden jaalis serve as privacy screens in additionto offering shade. They provide privacy and security by enabling inhabitantsto see outside without being seen.

Living in a Community: Pol homes are frequently located in tight-knit neighborhoods with shared communal areas and courtyards. This encourages shared living and a sense of community.

3.5. ARCHITECTURE EVOLUTION IN EAST INDIA

Eastern India's architectural development is a fascinating story that reflectsa diverse range of artistic expression, history, and culture. This region, which includes the states of West Bengal, Odisha, Bihar, and Jharkhand, has seen the development of unique architectural styles over the course of centuries. Kolkata's architecture is characterized by massive colonial-era structures and the recognizable Howrah Bridge, which are remains of colonial influences, mostly British. Eastern Indian architecture of today showcases the region's ongoing cultural richness and its adaptation to the opportunities and challenges of the modern era by integrating modern trendswith its rich historical legacy.

3.5.1. ASSAM

Figure 58 Assam house

Introduction

Assam is one of many wonders in India, It has some untold story of architecture that we all are craving, Assam being one of the seven sisters ofeastern India has some different styles of architecture called the Assam typebuildings, but Assam has more architecture styles rather than the Assam type buildings.

Assam is one such state that follows the vernacular architecture to date, vernacular architecture- is houses built with all the available resources around the locality, vernacular architecture is also effectively proven to survive with the climate of the region.

In Assam, the architecture of houses is based on the climate people face andprotects them from the calamities of nature. Before the British advent in India, Assam the home of nature and wonders have houses made of bamboo,timber, and thatch, the Assam traditional architecture so-called Ahom didn’tinvolve bricks and stones in their architecture until early 1700, bamboo and timber(woods) are used to construct buildings in Assam because it suits wellfor their climate.

The Assamese people followed the vernacular architecture, which mostly used wood, timber, and bamboo. However, the British introduced the use ofbricks and stones to ensure the longevity of the buildings. As a result, the Assamese people's architectural tradition was completely altered by the British.

Architecture characteristics

The majority of traditional building in the northeastern region is made up of the traditional "Ikra" bamboo huts, commonly referred to as Assamese- style housing. These types of housing are typical in Northeast India. The majority of these homes are occupied by people. These homes are typicallyconstructed using lightweight, locally accessible materials like bamboo, thatch, and wooden boards. These homes satisfy the rectangularity and simplicity criteria for earthquake safety and have an appropriate bamboo/wooden beam-column arrangement.

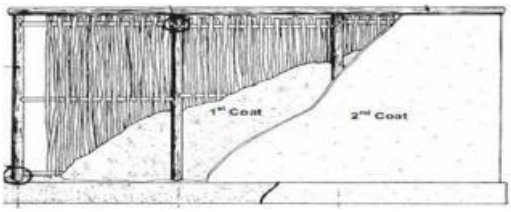


Figure 59 Bamboo strips plastered with mud or cement.

The above characteristics resulted from social time patterns, caste systems,gender roles, joint family demands, social and religious challenges, as well as structural and climatic limitations.

Figure 60 Elevation

With the use of steel angles and flats, the masonry foundation walls and the bamboo superstructure are fastened together with bolts and nails. There have been no reports of significant damage to Ikra structures following themost recent earthquake. These kinds of homes serve as excellent examplesof several key concepts of earthquake-safe non-engineered building construction, such as appropriate sitting and location on firm soils, good building configuration, or the shape and size of the building in plan and elevation, the number, location, and size of openings, and specifics regarding the connections between non-structural elements and the main structural system. Because of the right essential activity that arises from thecorrect connections between the many elements, these houses work as a single unit.

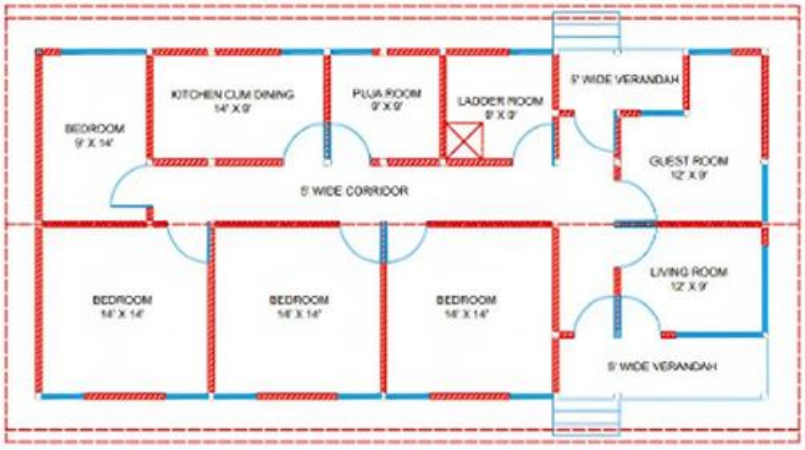


Figure 61 plan

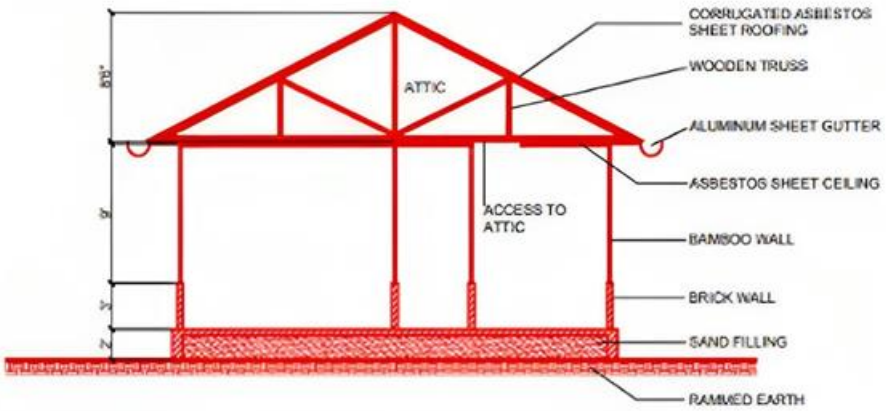


Figure 62 Section

Aesthetic Elements:

Thatched Roofs: Traditional Assamese houses often have thatched roofs made from materials such as bamboo and straw. These thatched roofs give the houses a rustic and charming appearance.

Bamboo and Cane Construction: Bamboo and cane are commonly used in the construction of walls and roofs. These natural materials contribute tothe aesthetic appeal of the houses.

Elevated Platforms: Assam region houses are often built on elevated platforms to protect against flooding during the monsoon season. The spacebeneath the house is used for various purposes.

Functional Elements:

Raised Plinths: The elevated platform on which Assam houses are built serves a functional purpose, offering protection from floods and providing a space for livestock or storage.

Natural Ventilation: The houses are designed to maximize natural ventilation to combat the region's hot and humid climate. Large windows and open spaces facilitate air circulation.

Bamboo Screens: Bamboo screens or curtains are used to provide privacyand shade. They can be easily rolled up or down as needed.

Functional Layout: Assam houses have a functional layout with separate spaces for different activities, such as sleeping, cooking, and social gatherings.

Thermal Regulation: Thatched roofs and bamboo walls provide natural insulation and help maintain a comfortable temperature inside the house.

Rainwater Harvesting: Some houses incorporate rainwater harvesting systems, collecting rainwater from the roofs for various domestic purposes.**Traditional Kitchens:** Assam houses often have traditional kitchens with open fireplaces for cooking. These kitchens are designed to reduce indoor heat and smoke.

Cattle Sheds: Some houses include separate areas for cattle and livestock,emphasizing the importance of agriculture in the region.

3.6. ARCHITECTURE EVOLUTION IN NORTH EAST INDIA

Northeast India's architectural development is a fascinating trip thatrepresents the region's distinct historical richness and cultural variety. Thisregion, which includes states like Assam, Manipur, Nagaland, Meghalaya, Arunachal Pradesh, Mizoram, Tripura, and Sikkim, has established uniquearchitectural traditions of its own. Traditional constructions like communal huts and stilt houses have been made using local building materials likebamboo and thatch. Many of these architectural designs were created toendure the various weather conditions found in the area.

Modern designs and materials are being combined with traditional aspects in Guwahati and other urban centers, where modernism has impacted architectural trends in recent years.

3.6.1. ARUNACHAL PRADESH

Figure 63 Traditional house

Introduction

Literally transformed, Arunachal Pradesh means "land of dawn-lit mountains." Arunachal, which became a fully-fledged state in 1987, is proofof the concept of federalism in contemporary India. Arunachal is a very stunning state with a varied culture and rough landscape. It's a fascinating location that perfectly embodies the idea of unity in diversity as a micro- India. Arunachal Pradesh is the largest state in northeastern India, spanning83,743 square kilometers. It was at that time that Arunachal Pradesh was first named. Before then, it was referred to as the North East Border Agency and directly managed by the Indian government's Ministry of External Affairs.

Architecture characteristics

The Arunachal tribal dwellings are a testament to the power of traditional homemaking techniques. The size of the houses is determined by the familystructures of the tribes of Arunachal Pradesh, and they reflect the traditional style of building housing from materials that are available locally. The tribes' homes have been constructed to withstand the harsh environment because of the difficult living circumstances in this region.

House of Adi Tribe

- Size of the house depends on the family
- Traditional houses are constructed with bamboos, woods, canes, leaves
- House raised well above the grounds with the help of stilts
- On these stilts are tied wooden beams & thus the level floor is made
- Roof is made by dry paddy straws, dry too leaves or thatch grass
- No nail is used in their construction
- Construct their houses either on the plain level ground or on the slopingground
- Adi house has no windows & there are two doors, one in the front for malemembers & the other at the back for women

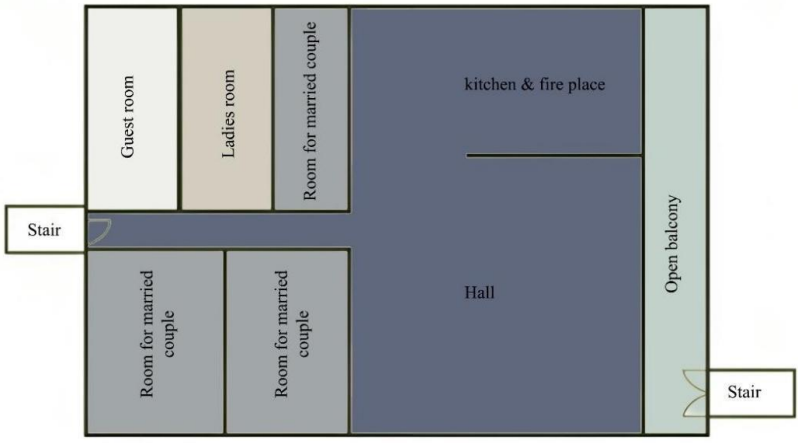


Figure 64 Basic layout of Adi house

House of Nyishi Tribe

- The indigenous house utilizes wood and bamboo, with roofing materials like thatch, Chinese palm leaves, cane leaves, or jungle banana leaves, based on local availability.
- Cane ropes securely bind all joints.
- Raised 2.5 meters from the ground, the floor level is, with the ceiling at 2.5 meters above the floor.
- The layout includes rear, front, and side verandas, a common room with a fireplace, bedrooms, and a guest room.
- Reinforcement nodes prevent longitudinal cracks from spreading throughout the structure.

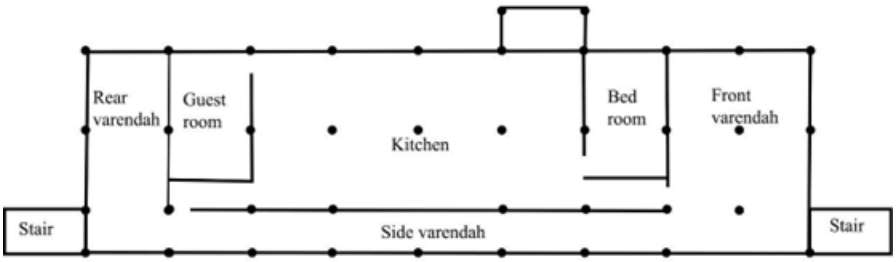


Figure 65 Plan

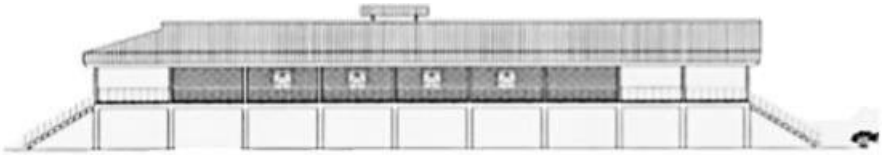


Figure 66 Side elevation

Construction techniques

The north-eastern beauty of India, Arunachal Pradesh, is a place of strikingnatural beauty and dynamic indigenous cultures. The state's traditional architecture, amidst the deep forests and high Himalayan peaks, is a monument to the resourcefulness of the indigenous tribes and their enduringrelationship to the difficult alpine landscape. In addition to offering shelter,the building methods employed in traditional Arunachal architecture capture the cultural customs, environmental adaptation, and sustainable mindset of the area.

The fundamental components of Arunachal Pradesh's traditional architecture are wood and bamboo. Because of its strength, quantity, and adaptability, bamboo is frequently utilized for building structure, walls, andfloors in homes. It's a decision that melds perfectly with the ingenuity and sustainability that characterize the area.

Thatched roofs are a miracle of adaptation, constructed from grass, bambooleaves, or other locally available materials. They are not merely useful. Because of the insulation provided by these roofs, the interiors remain warmin the chilly winter and cool in the intense summer. The frequent heavy rains is well discharged by the slope design, avoiding waterlogging and structural damage. The absence of metal or nails in Arunachal architectureis among its most remarkable characteristics. Rather, the structural elementsare joined together using natural fibres and bamboo strips. This increases the durability of the constructions by reducing the need for outside resources and showcasing the inventiveness of the native tribes.

Figure 67 Nyshi tribe house

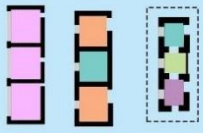
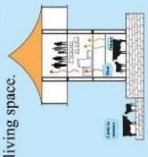
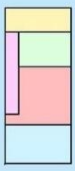
In Arunachal Pradesh, locals use cane and bamboo screens, known as "meshes," to create privacy while allowing for natural airflow. Thesescreens are both functional and artistic, often featuring intricate designs. The indigenous tribes of the region take great pride in the intricate carvingsand cultural themes used to decorate their homes. These decorative elements, often depicting religious and mythological themes, are a testament to the rich cultural heritage of the tribes. They serve as a beautiful example of the close relationship between culture and architecture. In certain parts of Arunachal Pradesh, "Morung" or "dera" are community longhouses. In addition to accommodating multiple families, these houses serve as communal gathering places, promoting a sense of unity and sharedhistory.

Figure 68 Elevations

CHAPTER: 4 CAMPARITIVE ANALYSIS

4.1 ANALYSIS OF CASE STUDY

Table 1 Case study analysis

REGION	CASE STUDY AND PLAN	ELEVATION	CULTURE/ REGION SIGNIFICANCE	AESTHETIC ELEMENTS	FUNCTIONAL ELEMENTS
NORTH	HIMACHAL PRADESH 		**Regional siginificance:**Kath Kuni architecture is intricately tied to the unique landscape of Himachal Pradesh. **Cultural significance:**The construction of Kath Kuni houses involves a deep understanding of local customs and traditions. The architectural style has been passed down through generations.	**Cultural symbolism:** Many Kath Kuni houses incorporate cultural symbolism, with carvings representing local deities and religious beliefs. 	Kath Kuni architecture prioritizes natural ventilation. The design often includes strategically placed windows to maximize airflow, ensuring a well-ventilated and comfortable living space. 
	JODHPUR CITY (BLUE CITY) 		**Cultural Significance:** The blue color has cultural and religious significance for the Brahmin community, who are the primary inhabitants of the old City. **Regional significance:**The construction in Jodhpur predominantly utilizes local materials such as sandstone, giving the architecture a warm and earthy hue.	Jodhpur's streets often feature vibrant street art and murals. These colorful expressions contribute to the city's contemporary aesthetic while complementing the historic surroundings. 	**Adaptation to Arid Climate:** The architecture adapts to the arid climate through features like narrow streets that provide shade, flat-roofed houses that deflect the sun, and the use of locally sourced materials like sandstone, which helps in temperature regulation. 
SOUTH	KARAIKUDI 		**Cultural significance:**The design of Chettinad houses often accommodates the traditional joint-family system prevalent in the Chettiar community. **Regional significance:**The architecture adapts to the tropical climate of Tamil Nadu. The incorporation of open courtyards, high ceilings, and well-ventilated spaces facilitates natural cooling, addressing the region's warm temperatures.	Chettinad architecture stands out with its vibrant Athangudi tiles. These hand-painted tiles, famous for their designs, are used for flooring, adding special beauty inside the houses. 	The central courtyard serves as a functional space for various activities, from cooking to social gatherings. It often features a well for water storage. 

REGION	CASE STUDY AND PLAN	ELEVATION	CULTURE/ REGION SIGNIFICANCE	AESTHETIC ELEMENTS	FUNCTIONAL ELEMENTS
SOUTH	KERALA	traditional building adopt with modern designs	**Cultural significance:**Kerala houses are made for joint families. They have many rooms, courtyards, and connected spaces, encouraging families to live together and bond. **Regional significance:** Kerala houses traditionally use natural materials like wood, laterite stone, and clay tiles. This sustainable approach not only aligns with the region's resources but also promotes eco-friendly construction practices.	Kerala houses typically have sloping roofs with gables. These roofs are often covered with red clay tiles. The roof design not only adds to the aesthetics but also helps in rainwater harvesting.	Many Kerala houses are designed following the principles of Vastu Shastra, an ancient architectural system, to ensure harmony and positive energy flow within the home.
WEST	KUTCH	walls with decorative textures	**Cultural significance:** Kutch houses exhibit a rich artistic heritage through their vibrant decor, intricate mirror work, and exquisite embroideries. Each element reflects the community's cultural vibrancy, often passed down through generations. **Regional significance:** Kutch houses are emblematic of the region's identity. Each dwelling carries a story of the community's resilience, craftsmanship, and adaptability, showcasing a distinctive regional identity through its architecture.	Kutchi houses are adorned with stunning mud and mirror work. This decorative technique involves creating intricate patterns and designs using small pieces of mirrors, colored glass, and clay. It is a defining feature of Kutchi architecture.	Kutch houses often include built-in storage facilities to maximize space utilization in the compact Bhungas. Bhungas are designed to maximize natural cooling and ventilation. Ventilation openings allow air to flow through the structure, ensuring a comfortable environment.

REGION	CASE STUDY AND PLAN	ELEVATION	CULTURE/ REGION SIGNIFICANCE	AESTHETIC ELEMENTS	FUNCTIONAL ELEMENTS
WEST	NORTH GUJARAT (POL HOUSE)		**Cultural significance:** Pol houses are clustered in ancient neighborhoods called 'Pol' or 'Chowk.' These are designed around a sense of community, fostering strong social bonds among residents who share common courtyards and resources. **Regional significance:** Pol houses in history had small entrances and twisty lanes to stay safe from invaders. These lanes also helped recognize different communities living inside the Pol.	Pol houses are organized around central courtyards, known as "chowks." These courtyards are open-air spaces that provide natural light and ventilation.	Pol houses are often part of a closely-knit community where neighbors share common courtyards and social spaces. This promotes a sense of community and shared living.
EAST	ASSAM		**Cultural significance:** Assamese 'chang ghars' or 'kutcha houses' are made on stilts with bamboo, thatch, and mud. They show the community's traditional way of life and skill in building. **Regional significance:** In Assam, houses have slanted roofs for rain, raised floors for floods, and strong bamboo, perfect for the weather.	Lots of houses in Assam have pretty paintings inside and outside. They usually show religious or cultural stories.	Assam houses are up high to stay safe from floods and give room for animals or storage.
NORTH EAST	ARUNACHAL PRADESH		**Cultural significance:** The north-eastern beauty of India, Arunachal Pradesh, is a place of striking natural beauty and dynamic indigenous cultures. **Regional significance:** The fundamental components of Arunachal Pradesh's traditional architecture are wood and bamboo.	Bamboo, wood, thatch, and local stones are meticulously crafted into beautiful patterns, showcasing the indigenous materials' inherent beauty	Stilted structures and raised floors prevent waterlogging during heavy rains, while sloping roofs efficiently shed snow, addressing the region's climatic challenges.

CHAPTER: 5 DISCUSSION

5.1. DISCUSSION OF CASE STUDIES

The comparative analysis of case studies from Indian region context andbasic understanding of culture and region is used to help the futuregeneration to know about culture and how previous generations have facedthe complicated topography and climate conditions to solve the problemsthrough architecture. Finding out what materials and construction methodsare used in each case study is important to investigate. And additionally The subdivision of place and how it supports cultural practices. Thematerials chosen for that building in the right context will determine howwell it functions in response to climate conditions.

Himachal Pradesh: To analyzing the himachal people's cultural practice and architectural techniques to understand the people how follow theancestor's behaviors and they are using local materials to create unique of kath-khuni architecture. This traditional architectural techniques are still used in parts of Arunachal Pradesh, particularly in remote villages and rural areas. Many communities in these regions continue to construct houses using locally available materials like bamboo, wood, and thatch, and adhereto traditional building methods. However, modernization and access to different materials have led to a shift in some architectural practices in moreurbanized or developed areas of the state.

Jodhpur city: Jodhpur, particularly in the older parts of the city known as the Blue City, many people continue to utilize traditional architectural techniques. The blue-painted houses, constructed closely together in the older neighborhoods, often use locally sourced materials and traditional building methods, contributing to the city's unique aesthetic. However, due to urbanization and modern construction practices, some newer developments may incorporate more contemporary building techniques andmaterials.

Karaikudi (chettinad house): The Chettinad house is a specificcommunity where people use older years for a joint family and then they follow some cultural practices that reflect the house. Nowadays, people construct houses with new techniques. The joint family concept rapidly decreases these reasons are affecting traditional buildings. But people still use their Chettinad houses for ritual habits. In certain regions of Chettinad,particularly in rural areas or areas preserving heritage, traditional architectural techniques are still employed. The use of Athangudi tiles, limeplastering, and construction with locally available materials like limestone,wood, and granite persists in these regions. However, modernization and urban development have also led to the incorporation of newer constructionmethods and materials in some Chettinad houses.

Kerala House: In Kerala, traditional architectural techniques are stillprevalent in many areas. The use of indigenous materials like wood, laterite,and clay tiles, as well as the construction style that emphasizes natural ventilation and open spaces, continues in many homes and buildings. However, modernization and contemporary construction methods have also become common, particularly in urban areas, leading to a blend of traditional and modern architectural styles in Kerala's buildings.

Kutch (Bhunga house): traditional architectural techniques are still practiced by some communities in Kutch, Gujarat. The construction of Bhungas, the traditional circular houses with thatched roofs, using local materials like mud, bamboo, and timber, remains prevalent in certainregions. These techniques are appreciated for their resilience against earthquakes and suitability for the desert climate. However, modernization and evolving architectural preferences have also led to a shift towards contemporary construction methods in some areas.

Gujarat (Pol house): Some parts of Gujarat, especially the ancient city ofAhmedabad, still maintain some of the old building methods of Pol homes.Many of the original Pol houses have experienced maintenance or changes using modern construction techniques while keeping components of their traditional design, while some have been kept and maintained to reflect their historical architecture. In certain regions of Gujarat, the idea of "Pol houses," with their condensed neighborhoods and unique characteristics, isstill built in the state's architectural heritage.

Assam (Ikra house): in many parts of Assam, traditional house construction techniques are still in use. The indigenous architecture, with its raised floors, thatched roofs, and use of bamboo and mud, remains relevant in rural areas and even in some modern adaptations of Assamese homes. These traditional techniques often reflect the local climate and cultural preferences, offering sustainable and practical solutions. The traditional Ikra house architecture in Assam is not as commonly used today. With evolving construction practices and modernization, many have shiftedaway from the traditional Ikra house design. However, in certain remote or rural areas, some communities might still employ elements of Ikra architecture, incorporating traditional methods and materials in their construction.

Arunachal Pradesh: many communities in Arunachal Pradesh continue toutilize traditional house-building techniques in certain regions. However, with urbanization and modernization, some areas have witnessed a shift towards more contemporary construction methods and materials. The extentto which traditional techniques persist varies among different tribes and communities, influenced by factors like accessibility to modern resources, cultural practices, and individual preferences. Nonetheless, traditional architecture remains an integral part of Arunachal Pradesh's cultural heritage and identity for many residents.

CONCLUSION

Architecture serves as a profound reflection of the essence and ethos of a community. It's a canvas where cultural values, belief systems, and the essence of daily life are artistically etched. This convergence of cultural andregional influences in architectural design crafts an enchanting narrative that spans human history and its relationship with the surrounding environment. These architectural marvels, born from the fusion of cultural symbolism and practical considerations, transcend mere shelters; they become storytellers of civilizations.

Considerations such as climate, terrain, and locally available resources refine architectural solutions, accentuating adaptability and sustainability. Beyond their visual appeal, these structures ingeniously adapt to the nuances of their environments. They're not just beautiful; they're functionalembodiments of innovation and resilience, adeptly adapting to the challenges posed by the local landscape. The intertwining of cultural and regional influences forms the very fabric of architectural identity. Each building, a testament to its people and the lands they call home, resonates with a unique tale of heritage and tradition. Take, for instance, the intricate woodwork adorning Assamese homes or the striking blue hues defining Jodhpur's skyline.

These are not mere buildings; they're reflections of a richcultural tapestry interwoven with the essence of the region.

The dynamic interplay between culture and region within architectural design is a tribute to tradition's enduring legacy and the perpetual necessity for innovation. It extends an open invitation to explore the vast and diversearchitectural heritage worldwide, fostering a profound admiration for the architects who transformed cultural and regional ideals into tangible, functional, and breathtaking structures. These creations not only enrich ourlives but also serve as windows into the captivating world around us, deepening our understanding of history, culture, and the awe-inspiring resilience of human ingenuity.

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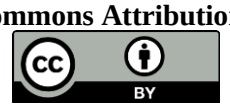

editor@iaeme.com