

# **IDENTIFICATION OF ARCHETYPICAL VERNACULAR ARCHITECTURAL FORM OF BENGAL**

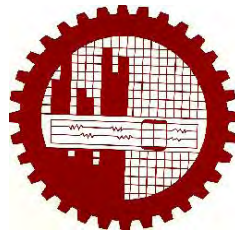
**By**

**Mehnaz Tabassum**

A thesis submitted in partial fulfilment of the requirement for the degree of

**MASTER OF ARCHITECTURE**

24<sup>th</sup> March 2019



Department of Architecture


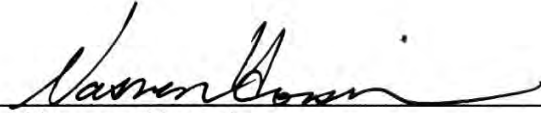


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**Dedicated to my 'FAMILY' and to the memory of my**

---

**'NANA'(Grandfather)....**

Without whom none of my success would be possible ....

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## IDENTIFICATION OF ARCHETYPICAL VERNACULAR ARCHITECTURAL FORM OF BENGAL

### ABSTRACT

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The architecture of Bengal produced a distinct regional identity which was influenced by Geoclimatic, political, social, religious and cultural characteristics as well as the material and environment of this region. All of these influences have unfolded a type of architectural style which has roots both native and vernacular. In order to provide better architectural response for the future, it was essential to look back on examples that have passed the test of time and provide clue to inherent qualities of traditional Bengal architecture. During this discourse the study tend to refer to various architectural form as traditional vernacular form but without concrete evidence that uniquely belongs to Bengal. The question, therefore, was what and which one is Bengal's archetypical vernacular architectural form?

In Bengal, like any other part of the world, traditional architecture showed its sustainability resilience by their harmonic balance with the surrounding society and environment. With its specific character of forms and spatial relationships, these traditional built forms hold the heritage of the country's long history and traditions. The history, which is taught in making local architects accept as reference for practice, seeks a basic form identified as the origin of architecture in Bengal. The assumption behind any historical approach is that one can learn from the past; the study of the past is of value philosophically as well as in making us aware of the complexity and overlapping of interventions. This study here forth begins with the point that history of establishment of human institution in the deltaic region in Bengal that can be understood by revealing the relation among human instinct, environment and built form.

Vernacular architecture is also subject to change over time. The past studies of vernacular architecture form mostly are confined to the historical point of view and generally attached great importance to the most basic project studies which including but not limited to conducting massive surveys, collecting historical data and mapping. As a consequence, a large number of valuable data and experience was accumulated and turned into the essential conditions of research on archetypical vernacular architecture form through the critical literature reviewing, progressive archaeological excavation and by the referencing of historic pictographic information. However, in order to have a more focused study and cater to living demands and emotional appeal of modern residents, besides architecture, research methods and theoretical system of other disciplines were used for reference, and also new perspectives were formed to understand and study the spatial form and reconstructing technology of vernacular architecture. The cross connection and mutual complementation of Architecture and other modern science fields, such as Humanistic Geography, Sociology, Cultural Anthropology and contextual study has opened up new discipline research directions. This has provided a lens to look back to Bengal architecture to decipher archetypal form.

The study attempted to trace back the archetypical vernacular architectural forms in Bengal that is instrumental in generating all the types of architectural built form in various scales. The analysis in this research is an attempt to learn from the past, understand the present and chart directions for design for a better future. Basic archetypical architecture of Bengal has components like a plinth above flood level, openness, ventilation, rain repelling wall and roof all employing locally available materials. From a simple shelter in the flood plain with responsive *Bhita* (site), *Bera* (wall/enclosure), *Chala* (Roof) and *Uthan* (Courtyard) an archetype evolved in the Bengal delta. This archetype has evolved in to various forms in response to technical, social and cultural interventions and needs from time to time. This archetypal form shows clue to all the sustainable architectural forms that has evolved in this region.

### **Keywords:**

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Bengal, Archetype, Vernacular Architecture, Indigenous, Tradition, Context

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## 1.1 Backdrop

*“A country’s architecture is a near perfect record of its history. Every building captures in physical form the climate and resources of a country’s geography, and the conditions of its society... Every building explains the time and place in which it was built.”*

The point above raised by Max Freeland in 1968, refers to the importance of original heritage that we can observe and develop as the guiding principles and that constitute a tangible link with the past—in other words, a reflection and knowledge about our roots. (Charles,1978) The connection and relationship between nature and architecture is one which triggers the evaluation and evolution of many criticisms and questions as well as solutions.

The search of the roots of Bengal Architecture is evident in the traditional house form. Bengal possesses a rich tradition in the formation and developments of its human settlements. The built forms of these settlements have their own specific characteristics and vocabulary (Haq, 1994; Hassan,1985). “Tradition is not only a fixed set of devices and images; it may be seen as a series of superimposed layers of interventions. But deep beneath, when the layers are unfolded, the indigenous archetype becomes visible. The archetype shows the clues to a hidden order that gives a distinctive texture to an indigenous settlement” ... (Mowla,1997). The traditional dwelling is a realm of multiple determinants. It is the result of various types of interaction between man and his environment (biotic & abiotic) and it includes all the ties that unify architecture and space with a given culture and society (Islam,2003). Bengal architecture is a unique example of phenomenological interpretation and is the architecture of Wind, Water and Clay (Haque, 1997).

The Architecture of Bengal constitutes a very distinctive character, defines a distinguishable cultural entity. The distinctiveness rests primarily on the deltaic condition of the region and its critical location in a wider geographical and cultural milieu. While the data generates mythology of “timeless landscape” the cultural location creates a history of conflicts and contradictions, and synthesis and transformations. (Ashraf, 1997). Architecture is a product of a long and complex evolutionary process. In this process, architecture has been changing with the influences of different factors like social, economic, technological, etc. Architecture in Bengal also has been changed and modified at different times with the changes of rulers and circumstances.

The research would continue to the reconstruction of the history of architecture of this delta by identifying the philosophical uniqueness beyond a stylistic evolution of architectural elements, the present study intends to reveal that dwelling forms stand for a symbol of a continuous historicity of social and political suppression, climatic reason, construction rationale along with the chemistry of economic hierarchy and an aspiration for mass freedom. The value of a form, as an image, can be considered as an epitome of human ambition or a symbol within an indeterminable state of history. The form has to follow some absolute rules or a set of dogma such as a set of joining rules against the gravity or obeying its climatic setting.

The study will provide us an understanding of the traditional form, layouts, design, materials, and methods that has the perspective of improvement and adaptation to meet the present and future needs i.e. to find Bengal’s prototype/archetype architectural form as our heritage.

## 1.2 Research problem

The land of Bengal was formed gradually by some three hundred rivers. Furthermore, every aspect of life in Bangladesh is shaped by two primary things: a broad deltaic plain subject to frequent flooding and many rivers. Innumerable number and vastness of rivers are the basis of all structural formation in Bengal. These rivers and river-based agriculture helped to develop an ethnic native identity which stresses to develop unique indigenous vernacular spaces and architecture.

It's a land of about only 1, 47,610 sq. /km, but we can find some notable geographical changes—which shape Bengal's architectural development as well. Bengal used to be a part of the mighty Mughal Empire, which was the period of Muslim architecture, and yet it was also a place of pilgrimage for Hindus and Buddhists. Furthermore, if we want to discover the fingerprint of Bengal architecture, we should go way back to its geographical development period. Bengal Architecture is so simple-- formless, entirely excluded from concrete but still, it is an extraordinary example of purely organic and vernacular architecture. Building orientation, gardens, and windows bear significant importance as those will provide an opportunity to interact with the environment. The architecture of Bengal is thousands of years old and has deep cultural roots (Kahn, 1994). People will never find these kinds of structures anywhere else in the world.

However, the present situation in Bangladesh is quite different. The increasing globalization and advancement in science and technology have caused the country to move away from the traditional form of architecture. Auspiciously, in Bangladesh, there are some excellent examples of extraordinary architectural works—the works which grow out of traditional roots, and which are molded by Bengali heritage and culture. Those buildings are timeless, authentic examples of regional architecture —"The Fingerprint of Bengal Architecture" (Hosey, 2012).

The comprehension and clarification of any architecture basically involve the simultaneous understanding of two things: the related theoretical works and the architectural artifacts themselves however, both focus on the stylistic study. For Bangladeshi architecture, there were in existence, two kinds of theoretical discourse. One of these considered only the rural hut in isolation and focused on how its elements determined factors of identity in architecture. This discussion propagated the wide-spread belief in the bent roof shape being one important identifying characteristic of Bengal architecture. The approach of the second argument was an anthropological one. With tools developed from Amos Rapoport's work, the spaces and activities of the house were studied. This distinguished differences among the created spaces in the functional, social and religious terms and advocated the introvert courtyard type as the essential characteristic of Bangladeshi architecture. However, from the point of view of the practicing architect, both discussions fail to inform possible strategies which may yield a contemporary architecture that would embody some sense of the local identity. This study stems from an attempt to respond to this problem. Therefore, it is more comprehensive in its scope and considers diverse sources in its quest for the fundamental elements. Its intention is an attempt to identify the basic characteristics of Bengal architecture, which may serve to allow architects to work with or against questions of local 'meanings' in Bangladesh. The analysis in this research is an attempt to learn from the past, understand the present and chart directions of design for a better future. R. Lewcock (1988) emphasizes this approach when he says:

... *“At any given time, the man-made world is inevitably the measure we use to determine the direction of change. Whatever we may think of it, the world around us provides the basis for decisions about the future. We are keenly aware of its deficiencies, but not always so aware of its strengths. From time to time it is wise to pause and consider whether what we might be losing when we change something. The corollary to this is to look back to see whether what we lost yesterday might, with little effort, be regained”* (pp. v-vi).” (Lewcock, 1988)

How are we then to retrieve the lost forms of architecture, with their characteristics and details? How much can we rely on archeological fragments, epigraphic records, representations of sculptures, illustrations in an old manuscript, or folk rituals? It is only through a process of interpretation that can perhaps be reconstructed. Further, there is the major problem of lack of historical materials by which an uninterrupted narration can be constructed. The historical terrain of Bangladesh not only lacks originating evidence but is also full of gaps regarding concrete architectural remains. Flourishing cities with magnificent architecture, such as Gange, Tamralipti, Karnasubarna, Kotibarsha, and Rampal, described by many travelers, are now only legends.

Historically the architecture of Bangladesh is of transient nature. Building activity in Bengal at a later period is in two distinguishable modes: the permanent and the less permanent. The permanent (although it also often disappeared mostly due to the hostile geo-climate) consisted of religious buildings and sometime later buildings of the nobility. General dwellings-from the common hut to feudal palaces-were built of quickly perishable materials such as bamboo, timber, and mud, although some buildings had more elaborate and exquisite craftsmanship. Even certain Mughal governors, who certainly had the power and resource to build in an opulent manner, preferred to live in tent-like or timber-built structures: Islam Khan is known to have lived on a barge on the Buriganga. The traditional common dwellings persist even today, with some modifications, but the techniques and crafts of more complex structures have disappeared. A single carved wooden pillar nearly twenty feet high, now at the National Museum, clearly part of an elaborate system of pillars and beams, is a melancholy reminder of this lost tradition. However, the focus of this study is to identify the archetypical pattern from which all the later typologies has generated.

### **1.3 Research question**

If we look back to understand our historical and cultural matrix in the perspective of world narration, we would always find a space of difference-fragmented and episodic history. The forces of history and tradition of settlements in Bengal is holding diverse ethnic, imperialistic cultural and religious beliefs. The research has been guided by the theoretical considerations of how the architecture is a product of social, cultural, political and economic determinants on the basis of a single pattern. As a reflection of these values, architecture embodies cultural meaning and interpretations.

Therefore, the research asks the following two interrelated questions:

- a. What and which one is Bengal’s archetypical vernacular architectural form?
- b. How the basic architectural form generated the subsequent architectural typologies?

### **1.4 Objectives of the research**

Architecture is a product of a long and complex evolutionary process. In this process architecture has been changing with the influences of different factors like social, economic, technological etc.



For the purpose of identifying the archetypical vernacular form of Bengal architecture, the research is conducted to reach the following specific objectives i.e.

- a. To identify the origin of architectural form in Bengal and the subsequent determinants of the evolving building forms.
- b. To single out a traditional archetype-built form which is responsive to the context and which presents the vernacular expression, cultural significances, ecological and economic reasoning.

## 1.5 Scope and Limitation of the research

Before the partition of Bengal, the architectural culture, whether termed Muslim or Hindu, was contiguous with the wider geopolitical entity of Bengal and beyond. The political border running like a rupture through the body of the capital of Bengal-Gaur-symbolizes this rather arbitrary delineation. The question of “localness “and its relationship with shifting political “realities” loom large in this context.

Vernacular house forms can be studied in different ways. One can look at them chronologically, tracing the development over time either of techniques, forms, and ideas, or of the thoughts of the designer, or one can study them from a specific point of view. The evidence of letters, diaries and architectural theories as evidenced in journals, books, and drawings and descriptions in travel books and elsewhere which is of such importance in traditional architectural history all provide primary sources of material for this research. The study tries to investigate and enunciate the development of vernacular spaces of Bengal through historical discourses, which is a new kind of voyager that open up a class of ‘instrumental’ or ‘native informants’, which function as an anecdote of alternate history, such a way indigenous knowledge can be turned into intellectual property.

This research tries to discover, the basic house and its form of Bengal. such an attempt presents particular problems, in this case, **first** there is no generally accepted conceptual framework, and, **second**, the amount of material is vast and not recorded in a systematic and uniform way. It is also not of uniform quality and does not deal with same aspects, and therefore cannot easily be directly compared. Lack of access to archival materials and inadequacy of relevant research by other disciplines has limited this investigation in places.

## 1.6 Theoretical approaches:

### 1.6.1 The denotation of Archetype:

The word *archetype* comes from the Greek *archetype* which means “original pattern.” Here is a definition.

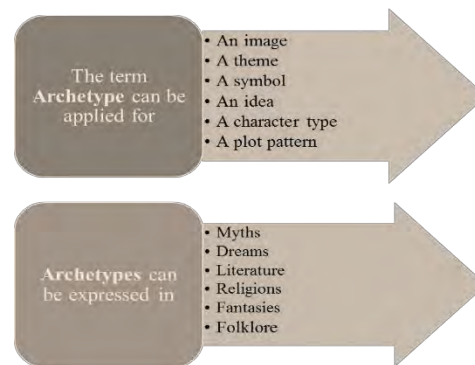
*An archetype is a primordial thing or circumstance that recurs consistently and is thought to be a universal concept or situation. (Arlow & Neustadt,2004)*

According to psychologist Carl Gustav Jung (Jung 1970), archetypes arise from a common fund of human experiences (the collective unconscious) that uses archetypes as one of its ordering and structuring principles. In fact, wherever there is a commonality of human experiences over extended periods of time, archetypes arise to help structure these experiences. One of the most intriguing aspects of the Jungian archetypes is that they naturally exhibit variability—they change their form

to adapt themselves to specific cultural contexts while their core semantics remain fixed. He recognized that there were universal patterns in all stories and mythologies regardless of culture or historical period and hypothesized that part of the human mind contained a collective unconscious shared by all members of the human species, a sort of universal, primal memory.

Archetype indicates the basic or original model which determines the formation of the lower but complex form. Plato's archetype is superordinate and preexistent to all phenomena. The term is used before the time of St. Augustine synonymous with 'Idea' in the Platonic usage. Kant's doctrine of categories gave rebirth of the Platonic spirit in modern time considering thinking, understanding and reasoning cannot be considered as an independent process subject to the eternal laws of logic rather they are *psychic functions* co-ordinate with the personality and subordinate to it (Blackburn, 1994: 23). It was Jung, who showed that 'archetypes are not disseminated only by tradition, language, and migration but that they can rearise spontaneously any time, at any place, and without any outside influence'. Architecture-as an archetype is not determined in regard to its content (the physicality of the building) but their 'form', In Aristotelian thought, the structure or nature that is imposed upon undifferentiated *Materia prima* to make the different kinds of substance in the world. Architectural image is determined as to its content only when it has become conscious and therefore in the premise of conscious experience. (Jung, 1970)

Joseph Campbell took Jung's ideas and applied them to world mythologies. In *A Hero with a Thousand Faces*, among other works, he refined the concept of hero and the hero's journey—George Lucas used Campbell's writings to formulate the Star Wars saga. Recognizing archetypal patterns in literature brings patterns we all unconsciously respond to in similar ways to a conscious level (Fig 1).



**Figure 1: Recognizing archetypal patterns in literature**  
Source: (Jung ,1981)

"The Archetypal Level involves the use of archetypal building elements, patterns, and forms that are most typically found in the world's sacred architecture. Buildings at this level speak in the natural language of space, which is rooted in the pre-verbal meanings of embodied experience: up and down, right and left, front and back, inside and outside, near and far, darkness and light, rough and smooth, warm and cool, the horizontal and vertical, the center and periphery. The archetypal and biologically rooted polarities of prospect and refuge, complexity and simplicity, enticement and peril are structured in ways that deepen and harmonize the apparent psychophysical opposites of lived experience. Often such buildings are shaped to higher levels of a formal order by use of the universal tradition of the qualitative number and sacred geometry. The archetypal level is the deepest layer of meaning and metaphoric signification in architecture. Buildings that reach this level

lead user back through layers of consciousness and time from the outer surface of the waking mind to the depths of what Carl Jung calls the collective unconscious and beyond, to the edge of the luminous ground of being itself.” (Coates, 2014).

Kahn always realized that the beginning and ultimate destiny of architecture is in the "unmeasurable", but this did not dissuade him in trying to understand the making of architecture on an "objective" or rational basis. To say that "architecture is an embodiment of the unmeasurable" only made the effort of tackling it on a rational territory a continuous and long search. In saying "Order is..." Kahn acknowledges the existence of an order of things, of nature, of human conduct, which not only predates the designer's intention but also any human action. Order, also synonymous with the idea of essence, whose origin is in the primordial collective condition of man, forms the existential world of man, making his life meaningful through such essential and definable activities as learning, living, working, meeting, questioning and expressing. Without this existential structure or pattern, the activities of man would have been fragmentary and unrelated with events happening before and after, collectively incoherent and totally meaningless to each other. It cannot just be; it must respond to and must be generated from a meaningful collective essence before becoming a physical artifact. Archetypes are the timeless 'landmarks' in the landscape of reality which man has created as a result of his collective living. Man adhere to these 'landmarks' to give meaning to his existence, to set a matrix on which life operates. While these 'landmarks' have no material form, they have a certain spirit, and the general task of architecture is to continually pursue embodying that spirit.

Everything has a different meaning and creates emotional experiences. Because of our primitive instincts, humans need sheltered spaces to protect themselves from climate and other threats. This characteristic is referred to as 'refuge' by Appleton (1996). Nevertheless, Appleton proposed "habitat Theory" and advanced the notion of "refuge-prospect". Humans have an inherent love for vast open spaces which he referred to as "prospect." The refuge areas allow people to see the outside threats and resources. A meaningful space is created when prospect and refuge are both present, and one can be seen from the other (Hildebrand, 2008). Moreover, Grant Hildebrand (2008) has identified five survival-advantageous characteristics: prospect and refuge; complex order; peril; and enticement (Hildebrand, 2008). It is quite evident in many perspectives that science has a deep relationship with nature. Natural symbols can be felt by our body and mind. Professor Coates also says that this level reveals the language of the space and also makes appropriate uses of the natural symbols of up and down, inside and outside, horizontal and vertical and so on (Harries, 1993).

All shapes, lines, and surfaces are set in accordance with the proportions that are found in nature and exhibit perfect systems of beauty. In Australia, cities have been shaped by British tradition and the inhabitants led to believe that the Australian history of architecture turned on the evolution of early Victorian to the middle to late Victorian and then to Edwardian styles, always with Georgian and Neoclassical hanging around. And, of course, long live the International Style! History told from a perspective fixed in a temperate and urban experience. The notion of Australian architectures that responded to diverse Australian environments, resources, and our own Aboriginal heritage, did not find its way into the curriculum back then. In 1977, Phil Harris & Adrian Welke's founders of Troppo together with James Hayter and Justin Hill decided to investigate beyond the urban realm, beyond Australia's recorded architectural history. They set off in a VW Kombi on a clockwise course around Oz. And, indeed, found a great diversity of approach

to shelter-making, a diversity that spoke of Place of climate, natural resources and of the settlers' own creative response to their environment (Fig. 02).

Its whitefella architectural history runs like this:

At first, the town was built from what was locally available – split woven bamboo, local cypress – and also from the lightest materials that could be brought by ship or on camel back – fabric and corrugated iron.



In 1911, the Territory moved from South Australian to Commonwealth control, and senior public servants were granted one of these, the 1st of a series of proudly North Australian houses – houses that 'breathe' in the close, tropical air...



World War 2 brought devastation from Japanese bombing raids. But the city regrouped, the tropical house reborn – albeit with a more austere aesthetic – carrying over the basics of simple planning, elevated construction, easily transported lightweight materials, fully open-able walls.



Then on Christmas Eve 1974, Cyclone Tracy flattened the place. The rebirth wasn't so breathe-easy pretty. Lessons from the past seemed lost...



They wrote about these things in the first history of Australia's own architecture, "Influences in Regional Architecture".

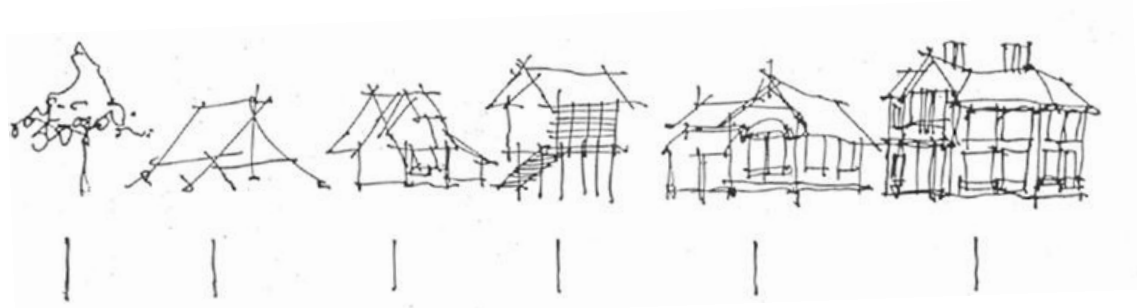


Figure 2: On a 'shelter number line', building up north, seemed to fit down at the end where shelter is afforded by a tree.

Source: (Phil Harris & Adrian Welke's Troppo founders, Australia)

## 1.6.2 What is vernacular architecture

### 1.6.2.1 Vernacular-ism in the history of architecture

Discussing the interpretations of vernacular architecture in different architectural records Oliver mentioned,

‘The majority of the buildings are systematically omitted from these publications; in other recognition is made to them only in passing’(Oliver,1997).

This neglected architecture holds the past culture, lifestyle, building technologies that are suitable for every specific region. The interest to study of these buildings got emphasis with the exhibition called “Architecture without architects” in 1964 by Rudofsky at the prestigious Metropolitan Museum of Modern Art in New York. The book “Architecture without architects” following the exhibition published by Bernard Rudofsky showed some of the undiscovered architecture around the world, those are surviving for thousands of years within a sustainable way. Sometimes this architecture had been called ‘native’, ‘primitive’, ‘indigenous’, ‘traditional’ or ‘vernacular’. Among those, the term which has gained the widest acceptance is ‘vernacular architecture’ with its linguistic comparison to the common people (Oliver, 1987). This research is not focusing on the distinctions between those terms but attempts to elaborate and examine the ideas of vernacular architecture.

### 1.6.2.2 Defining vernacular architecture

The purest definition of vernacular architecture is simple, ‘it is architecture without architects. It is a pure response to a particular person’s or society’s building needs. It fulfills these needs because it is crafted by the individual and society it is in. In addition, the building methods are tested through trial-and-error by the society of which they are built until their building methods reach near perfection (over time) and are tailored to the climatic, aesthetic, functional, and sociological needs of their given society. Because the person constructing the structure tends to be the person who will be using it, the architecture will be perfectly tailored to that individual’s particular wants and needs. We call buildings vernacular to highlight the cultural and contingent nature of all building. In this study, vernacular architecture is an approach to the whole of the built. It favors completeness, recognizes diversity, and seeks ways to use buildings as evidence in order to tell better versions of the human story. In the future, it will be obsolete, but now the term “vernacular” is one of the tools we use when we face architectural objects with a wish to crack them open and learn their meanings (Islam 2003).

The Latin word ‘*vernaculus*’ means native. In the native context, Architecture is vernacular when it exhibits distinct characteristics in construction techniques, material use, the performance of space, a social system within a particular community to sustain. Vernacular is also referred to as “the mode of expression of a group or class”. The Theoretical elaboration of vernacular idea primarily focused on the features of vernacular architecture:

“Vernacular architecture comprises the dwellings and all other buildings of the people. Related to their environmental contexts and available resources, they are owner or community-built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs, accommodating values, economics, and ways of living of the cultures that produce them.” (Oliver, 1987)

Vernacular architecture, therefore, is an essentially social and region-specific built form made of local materials using local technology in time and place by a particular community. It has been elicited that vernacular architecture has a particular priority in human societies mainly because this type of specific designing has not been costly and it has been in adaptation with the environment and climatic conditions. (Fig.3) indicates some conceptual diagrams about vernacular architecture from some scholars' points of view.

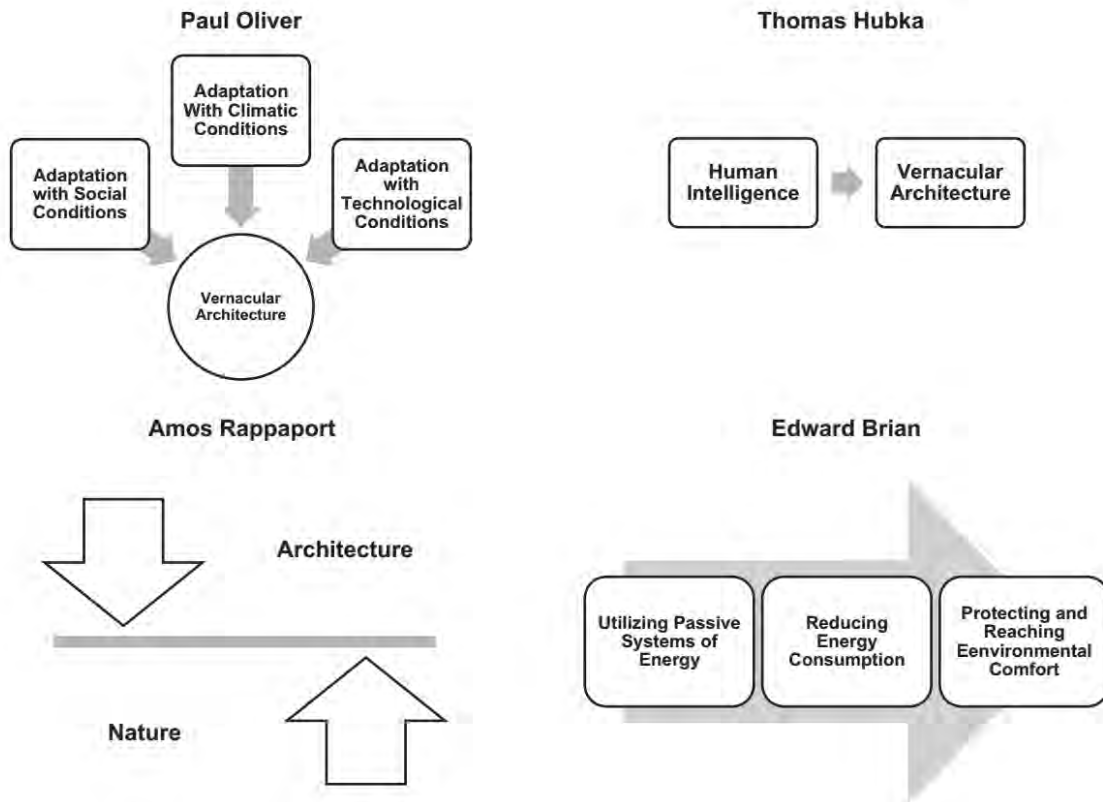


Figure 3: Conceptual diagrams of vernacular architecture from some scholars' points of view  
Source: (Produced by the author)

Amos Rapoport further classified vernacular as part of the folk tradition:

The folk tradition, on the one hand, is direct. . . translation into the physical form of a culture, its needs, and values - as well as the desires dreams and passions. . . It is the world view writ small, the "ideal" environment of a people expressed in buildings and settlements. . . The folk tradition is much more closely related to the culture of the majority and life as it is really lived. . . (Rapoport,1969)

Current definitions suggest that the vernacular dwelling is usually designed by a craftsman and not an architect and that it is built with local techniques, local materials, and with the local environment in mind. J. B. Jackson writes:

Such a dwelling does not pretend to stylistic sophistication. It is loyal to local forms and rarely accepts innovations/from outside the region. It. . . is little influenced by history in its wider sense. That is why the word timeless is much used in descriptions o/vernacular buildings. (Jackson,1984)

Most of these definitions can be mentioned as the descriptions of the essential features or purposes of vernacular architecture. With the help of these descriptions and in combination of the essential features a definition of vernacular architecture can be written as “Vernacular architecture refers to

the built forms that are built of local materials using available technology in a functional way that devised to meet the needs of common people in their time and place” (Fig 4).



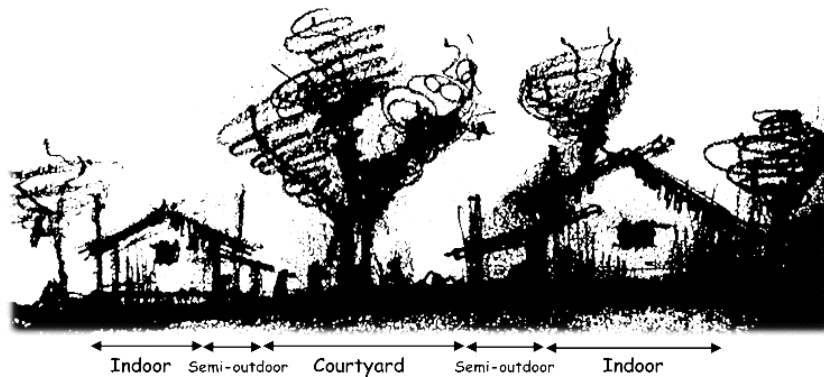
*Figure 4: A traditional Bengal house form built with local material and technique*  
Source: (Islam,2003)

Thus, vernacular tradition usually has only a few models, which are constantly being adjusted and readjusted. It is through such variation that individual houses gain their uniqueness. Most of these definitions can be mentioned as the descriptions of the essential features or purposes of vernacular architecture. With the help of these descriptions and in a combination of the essential features a definition of vernacular architecture can be written as “Vernacular architecture refers to the built forms that are built of local materials using available technology in a functional way that devised to meet the needs of common people in their time and place” (Fig 5). Rapoport says in his book ‘House Form and Culture ‘that a satisfactory definition of vernacular is more difficult. At the moment the successful way of describing it seems to be in terms of process-how it is designed and built’(Rapoport,1969)

In vernacular architecture, the expressive power of aesthetics and of correct formalization are very important. There is always a "right" and a "not right" way of doing things. Therefore, the architecture follows a theory. Bengal delta, hills rise to the north and east, but the vast delta of the center is wondrously lush and implacably flat. Its topography is handmade, every elevation requiring an equal and opposite excavation (Alam,2007). This process of adjustment to the topography dominates patterns of existence and culture and shapes its architecture. Bengal is a land of agriculture. Its architecture has to be in accord with its economy based on cultivation. The village has a common foundation built of earth, and it has a common roof shaped by the trees that rise to weave a canopy of leaves against the sun. Upon the shared foundation, beneath the shared roof, rural buildings are lifted from the ground on constructed earthen platforms (Fig 6). Domical stacks of rice straw stand among the buildings. Several generations have been living there for hundreds of years and maintaining their culture and traditions. In this way, the traditional rural architecture showed its adaptability and sustainability (Schendel,2009).



*Figure 5: A traditional Bengal household*  
Source: ( News, 1874)



*Figure 6: Traditional Space Sequences of Bengal Architecture*  
Source:( News, 1874)

Taking the comprehensive view and recognizing diversity, the study of vernacular architecture drives toward better historical procedures, ones that focus existentially on the action and lead to the construction of a multiplex idea of time. This definition of architecture attempts to recognize the shelters/and dwellings of general people as architecture. From these understanding, one cannot exclude the vernacular houses from the domain of architecture.

## **1.7 The context: The Origin of Bengal and Architectural Histography**

Bengal Architecture includes the architecture from modern-day Bangladesh and the West Bengal region of modern India (Map 1). The deltaic Bengal was always fortunate to maintain its own existence across different traditions, culture festivals and religious values (Haque, 1997) Furthermore, if we want to discover the fingerprint of Bengal architecture, we should go way back to its geographical development period.

In this study, we will use the word *Bengal* as a geographical periphery occupied by a Bengali spoken community derived from a common political history who shares an anthology of thought which



makes difference from others. The difference is made by its philosophical integrity which accommodates diversified practices of mass culture. The other inevitable meta-notion in this study is 'Bengal' giving us the operational context of the study. The name Bengal originally applied to the deltas of the Ganges and Brahmaputra, and a portion of the plains to the north, and this is still the application of the name as used by the people of the country. Historically, the land of 'Bengal' has had its own distinctive 'regional entity'. The geographers also consider 'Bengal' as a definite 'geographical region' in the entire subcontinent with diverse geo features.

'... At one extreme are the very high mountains, at the other the sea, and on both sides, the hard-hilly country; within, all the land is plain. Such is the geographical fortune of the Bengali people'. (Ray,1993, p. 72)



**Map 1: The ancient border-line of Bengal (Watch, 2018)**  
 (Presently, Deep Gray part is now in India, and the Brown Part is Bangladesh)  
 Source: (Watch, 2018.)

It is a fact that 'Bengal' carved out a distinct geographical location for itself in the eastern frontier of the South Asian subcontinent as early as in the Pleistocene age. Deep forests, highlands, and mountains of east, west and north, and the Bay of Bengal of the south - 'Bengal' is being surrounded by this natural girdle. While examining Bengal's geographical location, Barrie M. Morrison makes the significant comment on the geographical condition of the southern area. He opines that 'Bengal'

is a vast plain land and formed by the river flow alluvial soil. The eastern matrix comprises a predominantly water-based civilization- a world of moistness, fecundity and lushness-where cosmological and valorized concepts are generated from riverine dynamics and agricultural rituals (Figure 7).

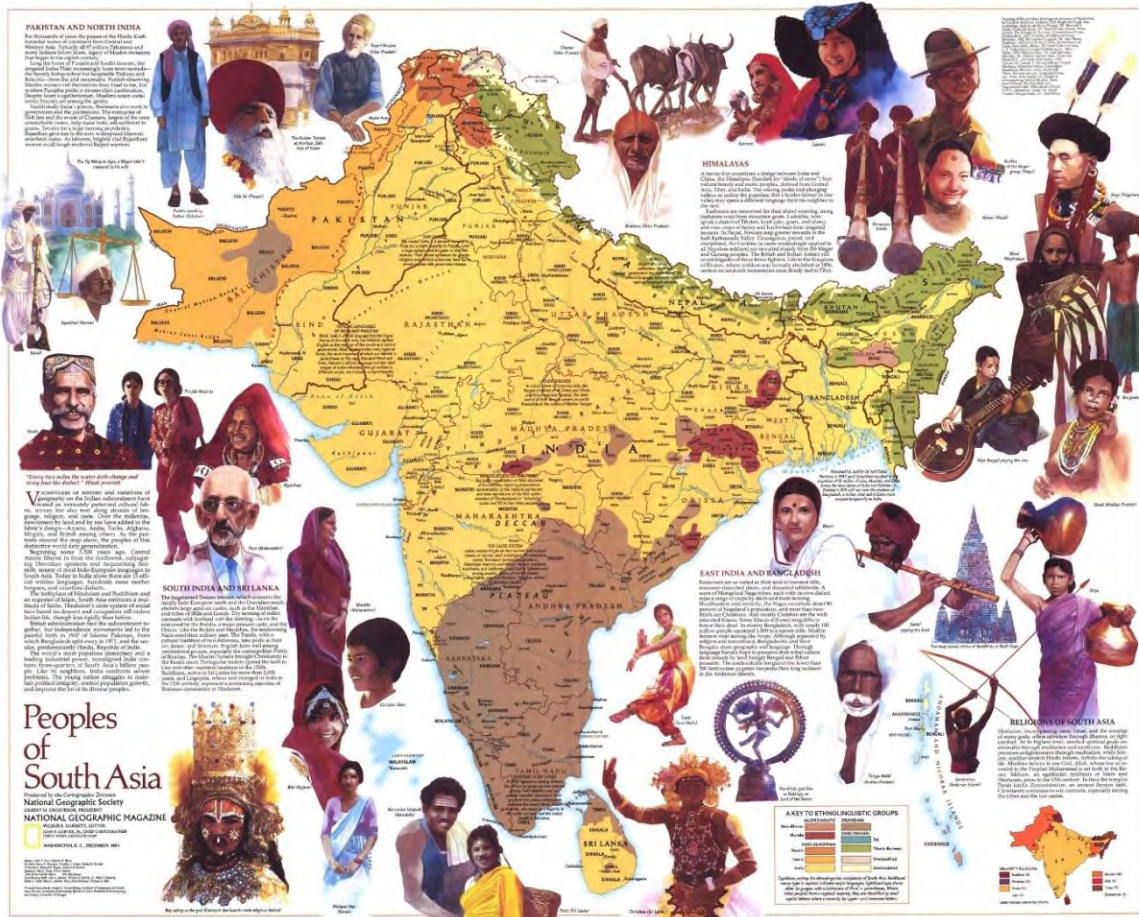


*Figure 7: The Ganges and the Development of Eastern Matrix of Delta*  
Source: (Rowlett, 2016)

The entire geographical situation, especially the geographical location of Bengal, has played the foremost significant role in the construction of the distinct identity of Bengal as such – the distinct socio-cultural efflorescence, its tradition and continuity, diverse religious life, art and architectural individuality, the vibrant trade and commerce, economic prosperity, and above all, formation of Bengal’s regional ‘personality’.

### 1.7.1 Demography/anthropology

Who were the early inhabitants of the Bengal delta? the various communities of cultivators, fishing and craft persons, religious specialists, trades, and rulers many diverse currents of culture mingled together and how they eventually merged into one in the settlements of Rarha, Pundra. Vanga and Samatata, which have comprised Bengal from very early times (Schendel,2009) (Fig 8).



**Figure 8: how many various races and how many diverse currents of culture mingled together and how they eventually merged into one in the settlements of Rarha, Pundra. Vanga and Samatata, which have comprised Bengal from very early times, but such an account may be sought in a people’s physical appearance, language, culture, and material civilization.**

Source: (National geographic magazine, 1984)

### Diversity and Assimilation in Bengal

The process of assimilation or syncretism is a long historic course of action that temporally spans over thousands of years and still continues at a slow tempo (Roy1987). Tagore has succinctly summarized this diversity of the physical types and assimilation in Bengal in a very beautiful poetic language as he draws a vivid portrayal of the region as the cradle of intermingling of races like Aryans, non- Aryans, Dravida, Chinese, Shakas, Hunas, Pathans and Mughals, blurring the scientific, biological distinction (Alam,2007). While analyzing the process of intermingling in Bengal, the scholars have identified the influence of three distinct human groups (*janadhara*) in the prehistoric age: i) the Mongoloid-Chinese flow; ii) Proto-Australoid or Veddid or Austric flow; and iii) Dravidian or Mediterranean flow (Ray,1993). At a much later date, the Indo-Aryans or North

India or Indo-Mediterranean or South Eurasian races arrived in the region and rendered acceleration to the ongoing intermingling in the region (Majumder 1963).

The above discussion underscores that the anthropo-cultural assimilation and intermingling of culture had started in Bengal from the early Stone Age under a very distinct geographical atmosphere. The tacit influence of the geographical environment of Bengal on anthropo-cultural assimilation has been highlighted by traveler Hiuen Tsang in his accounts of 7th century AD. He has described the varied behavioral patterns of people in different localities of Bengal (Ray,1993). From his descriptions, it also becomes apparent that different groups and communities of people had settled in different regions in Bengal. They have created the Bengali group (*Bengali Jan*), a new Bengali communitarian entity.

### 1.7.2 Bengal Architecture

Archaeological excavations have yielded numerous artifacts made of clay, mud, stones, and rocks which were made by the available raw materials of Bengal's geographical surface. Among the articles of daily functional architecture, the extensive use of bamboos, straw, reeds, and mud have been documented. To quote Prof. Dani: 'Bamboo, cane, and reed are the God-given material to the Bengalis who have used them from household architecture to all kinds of beautiful furniture, tools, and plants, baskets and mats, bowls and plates, storage jars and luxury items for the poor as well as for the nobility'. these pliant indigenous building materials which were abundantly available in the region, (like timber, bamboo, cane, and reed,) greatly influenced the evolution of a distinctive curvature of the roof and its cornice which when carried across its facade in a series of parallel curves results in the form of a bow. This is the typical architectural style, indigenous to the land, evidently derived from a bamboo framework, adapted to throw off heavy monsoon rain. This characteristic feature often termed folk-architecture, never rose to classical heights. Nevertheless, the style often transformed into masonry is invested with a freshness and spontaneity, expressive of a rural people keenly aware of the elements of nature affecting their daily life. It is evidently the outcome of ingenious but practical minds (Fig 9).



*Figure 9: Indigenous building materials which were abundantly available in the region, (like timber, bamboo, cane, and reed,) greatly influenced the evolution of a distinctive curvature of the roof and its cornice which represent Bengal architecture.*

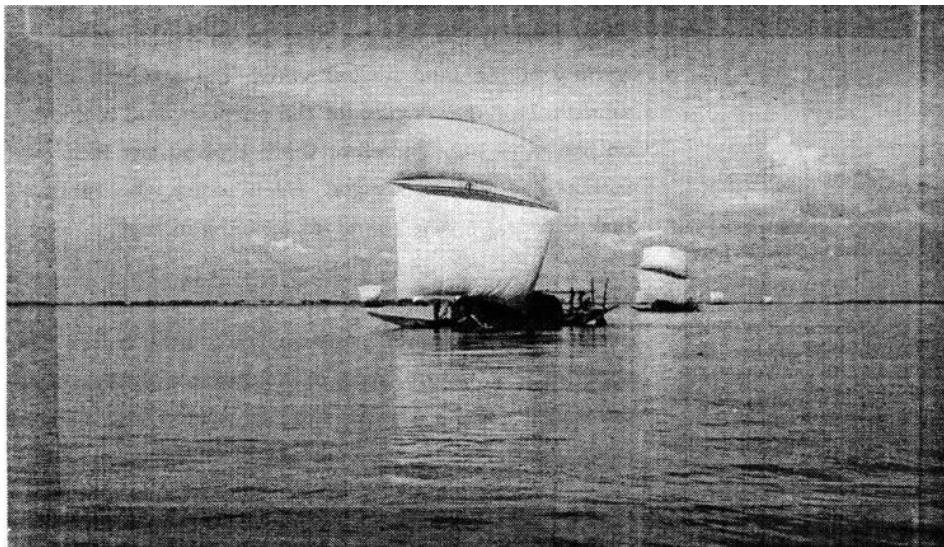
Source: (Haq,1992)

The fundamental fact is that from wet rice -production to material fabrication and to cultivating dwelling, living in the delta still means a deep tie to the land and the climate (Ashraf,1997). The land being essentially deltaic and riverine, a rich deposit of alluvium is readily available for the manufacture of brick. This cheap but excellent plastic medium logically encouraged the development of terracotta art, which, in its variety and richness, can hardly be equaled by any other country in the sub-continent of India. This explains why brickwork has been the building material which dominates the traditional architecture of Bengal, often embellished with intricate terracotta art on the surface.

There is evidence that major pockets of human settlements existed along the fertile valleys of agricultural value (Elahi,1984) (Fig 10). The art and architecture of the land was, therefore, essentially an expression of an agricultural society who eked out their living from the soil, which profoundly influenced their creations. The pattern of life in this land seems to have remained virtually unaffected over thousands of years. Numerous clusters of villages formed the bedrock of society, the bulk of which depended on agriculture and cottage industries. These rivers and river-based agriculture helped to develop an ethnic native identity which stresses to develop a unique indigenous vernacular space and architecture. In the words of Nihar Ranjan Roy,

the rivers of Bengal, forests, hills and plains, the warm humidity of the climate, the seasonal cycles, the drenched lowlands, and the thickets coastal regions have all more or less influence the social mosaic of this region.

Architecture is understood as a socio-cultural phenomenon rather than as a static and inert ‘object’ that can be studied only in terms of its formalistic characteristics. Vernacular architecture Our land, which is segmented by rivers, causes regionality. But regionality created by rivers has a unified multiregional cultural Condition. No contemporary historical work of the ancient period depicting the cultural life of ancient Bengal has yet been discovered. Due to this lacuna historians have had to depend on such primary sources as contemporary inscriptions, foreign accounts, secular and religious literature and materials unearthed in ancient archeological sites.



*Figure 10: The Bengal, pure chemistry of land and water; it is in fact land on lease from water. Formed by the silt, and then constantly shaped and reshaped by the rivers*

Source: (Haq,1992)

Identification of Archetypical Vernacular Architectural Form of Bengal

Bengal (Stages Of Evolution)					
Human Habitat	Archeological (Prehistoric and Protohistoric Period)	Religious	Social and cultural Ancient society	Historical	Architectural
<p><b>--Bang tribe</b> -7500 years ago</p> <p><b>--Negrota tril</b> -Andaman ,Malaysia, Thailand</p> <p><b>--Austroloid also called Austro Asiatic or Austric.</b> -From South east Asia</p> <p><b>--Dravidian.</b> -5000 years ago -language: Dravidian, Mongolian -Ethnic group of the Mediterranean border -language: Aryan</p>	<p><b>--Paleolithic</b></p> <p><b>--Mesolithic</b> CIRCA 4000BC</p> <p><b>--Neolithic</b> Between CIRCA 3<sup>rd</sup> Millennium B.C And 3<sup>rd</sup> Century B.C.</p> <p><b>--Chalcolithic</b> Between CIRCA Mid 2<sup>nd</sup> Millennium B.C And the later half of the 1st Millennium B.C</p> <p><b>-- Pandu Rajar Dhibi</b></p> <p><b>-- Mahasthangar brahmalipi.</b></p>		<p><b>Pre Aryan Society</b></p>	<p><b>--Pre Historic Period</b></p>	<p><b>Ancient</b></p>
<p><b>--Aryans.</b> -3500 years ago (1500B.C)</p>		<p><b>Buddhism</b></p> <p><b>Hinduism</b></p> <p><b>Janism</b></p>	<p><b>Aryan society</b></p> <p>-- Gupta period</p> <p>-- Pala period</p> <p>-- Sena period</p>	<p><b>-- Early Historic Period</b> --Mauryan period (3<sup>rd</sup> century B.C.E -3<sup>rd</sup> century C.E)</p> <p><b>-- Historical Period</b></p> <p>-- Gupta period ( 300 century C.E- middle of the 6<sup>th</sup> century C.E)</p> <p>-- Pala Period (c.756-1143 CE)</p> <p>-- Sena Period (c.1097-1223 C.E)</p>	<p><b>Early</b></p> <p><b>Historical</b></p>
<p><b>--Muslim Population.</b> -Arab,Turkish,Afgan, Mughals &amp; Persian.</p>		<p><b>Islam</b></p>	<p><b>Medieval society</b></p>	<p>--Delhi Sultanate: (1204-1526)</p> <p>--Sultanate of Bengal: 1352-1538,1554-1576</p> <p>--Mughal Empire: (1610-1707)</p> <p>--Nawabs of Bengal. (1707-1757)</p>	<p><b>Medieval</b></p>
		<p><b>Christianity</b></p>	<p><b>Modern society</b></p>	<p>-- East India Company (British Colonial Rule) (1757-1947)</p> <p>-- Independent state of Bangladesh 1971</p>	<p><b>Modern</b></p> <p><b>Contemporary</b></p>

Table 1: Historical Timeline of Bengal  
Source: (Prepare by the Author)

## 1.8 Organization of the research

This report is organized in several chapters. The chapters are arranged in such a sequence that ultimately the objectives can be obtained. The First Chapter gives the introduction to the research problem and discusses the basis of the research question, the explanation of the terms used in this study, and the existing paradigms of thoughts towards the research problem. Also explains the origin and the universal meaning of vernacular architecture and the meaning of archetype. First, it outlines the research questions by identifying the key problems and sets the research aim and objectives to organize the research design. Second, it reviews the literature to identify Bengal's archetypical vernacular form *and* finds the gap in knowledge. The next chapter deals with the methodology of the research. The theory, method and the process of analysis are explained there. The third chapter demonstrates the inherent power of archetypical form and the enduring relevance of vernacular architecture through historical interpretative research. The fourth chapter attempts to define 'vernacular architecture of Bangladesh' and an indigenous Bengali house is reviewed and analyzed with respect to its spatial organization. Furthermore, the house structures are described in relation to the influence of physical, sociocultural and economic factors through different phases. The subsequent chapter is the continuation of the results and analyses of the case studies. And the last chapter is consolidation and generalization of the entire study as a description of the context (past and present) to identify a generic outline of a prototype/archetype form to establish the identity of Bengal architecture for possible future use or research/practice.

## **Chapter 02      RESEARCH METHODS AND METHODOLOGY**

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### **Interpretative Historical Research**

#### **Content**

**2.1 ‘Interpretative Historical research’:  
A Brief Introduction**

**2.2 Traits of Historical Research**

**2.3 Types of evidence in Historical  
Research**

**2.4 Strength and weakness**

**2.5 Theoretical framework for historical  
reasoning for the past**

**2.6 Approach to the thesis and  
Methodology**



This chapter give a brief overview of what can be termed interpretative historical research and this term needs immediate clarification. In a strict sense, all research involver interpretation. However, this chapter defines interpretative research specifically as investigations into social physical phenomena within complex contexts, with a view toward explaining those phenomena in narrative form and in a holistic fusion. This chapter has four sections. The first section gives a general definition of the term interpretative historical research. The second section suggests categories for types of evidence. The third section illustrates a variety of tactics that can be used to access a condition in the historic past and the last section concludes by showing the strength and weakness of this kind of interpretative research.

## 2.1 ‘Interpretative Historical Research’: A Brief Introduction

The idea of subsuming "History"—which has its own disciplinary status in the academy, indeed, one of the oldest—under "interpretative research" might be questioned by some. Indeed, R. G. Collingwood has argued that historical inquiry is its own mode of knowledge. In each case, the researcher attempts to collect as much evidence as possible concerning a complex social phenomenon and seeks to provide an account of that phenomenon. This requires searching for evidence, collecting and organizing that evidence, evaluating it, and constructing a narrative from the evidence that is holistic and believable. Interpretation is active regardless of whether the task is evidence gathering, evaluation, or narration. In this chapter, we deal with what can be generally termed interpretive research, and this term needs immediate clarification. In a strict sense, all research involves interpretation. However, we define interpretive research specifically as investigations into social-physical phenomena within complex contexts, with a view toward explaining those phenomena in narrative form and in a holistic fashion. Hence the title interpretive-historical research, address research into complex social-physical phenomena that are contemporary relative to the researcher (Groat and Wang, 2013) (Fig 11).



*Figure 11: London home in 1893 (from Adrian Forty): “a palace of illusions . . .” By permission of Royal Commission to the Historical Monuments of England, where researcher interprets how social-cultural factors brought about material expressions of home.*

Source: (Groat and Wang, 2013)

## 2.2 Traits of historical research

In Forty's book, *The Pursuit of History*, John Tosh observes that historians are "as true as they can be to the surviving evidence of the past." Here narrating this evidence have been challenged by new perspectives—generally subsumed under the heading of "the cultural turn"—that have greatly expanded what constitutes "evidence from the past." Let's consider here how Forty's example illustrates both traditional as well as these new perspectives.

### 2.2.1 History research brings into view something from the past.

Because the "something from the past" is not empirically accessible, the history researcher must use various tactics for unearthing evidence from a time and a world not his or her own. In Forty's case, a fictional account from the past—an account nevertheless representative of those times—and a photograph of a home (Fig.13) interior are two examples of data he looked to for his interpretation.

### 2.2.2 Interpretation.

Forty's interpretation is just that: an interpretation. This is to say that aside from evidence from the past, the historian's point of view is a key part of historical research and narration. There is a technical as well as a theoretical aspect to the project of interpretation. Technically, evidence from the past abounds, and the researcher must know where to look for it and how to look for it; this is the technical aspect. The researcher must also know how to arrange the evidence in an interpretative framework, and interpretation perforce requires theoretical commitments. In recent years, due to the "cultural turn" in history research (addressed throughout this chapter), the role of schools of thought becomes all the more important.

### 2.2.3 Narrative.

How is history narrated, and in what ways can we be confident that history narration is robust and believable? The output of history research is not verse, or essay, or some other literary form; the output is narrative. This may seem obvious, but "narrative" in historiography requires its own discipline. The recent publication of *The Fiction of Narrative*, a retrospective of the work of Hayden White from 1957 to 2007, underlines how the topic of historical narrative can fund the output of a scholar's entire life's work (White,2010). Precisely because historiography concerns realities not present, White's insight is that it stands at the nexus between reportage, simplistically conceived, and story. With a view towards the "new" in the current practice of history, Tosh cites two influential bodies of theory. The first is the "cultural turn," whereby historians seek to interpret cultural meaning, drawing insights from cultural anthropology. The second body of theory derives broadly from various social theories, but particularly from the Marxist tradition (*Tosh, 215*). As part of this tradition, architectural and urban historians have been drawn to a spatial turn.

### 2.2.4 The cultural and Spatial turn

Forty's study of social factors that brought about changes in home interiors is part of a significant widening, in the later decades of the 20th century, in subjects previously regarded as unfit for historical analysis. Early in the century, in the words of Georg Iggers, "historians shared the optimism of the professionalized sciences generally, that methodologically controlled research made objective knowledge possible (Iggers,1999)." This viewpoint assumed that something like a single history of the world can be framed, given enough evidence. The cultural turn is a significant

reaction against this view as the 20th century played out. The historian Geoff Eley outlines the following characteristics of the cultural turn:

- a. Attention paid to gender issues.
- b. The influence of Michel Foucault’s work on power, knowledge, and regimes of truth in relation to social history.
- c. A departure from the French *Annales* approach to history, which was an earlier “turn” away from narrow political history to a broader variety of social and cultural issues, including the cultural outlook of periods.
- d. The emergence of cultural studies as a focus of historical research.
- e. An active dialogue between anthropology and history (Eley, 121–133).

Perhaps more descriptively, the cultural turn can be characterized by an outlook that the literary theorist Jean-Francois Lyotard (1924–1998) casts as “incredulity towards metanarratives (Lyotard,1984).” On the other hand, spatial turn also related to cultural turn.

### 2.3 Types of evidence in historical research

The Modern Researcher, Jacques Barzun, and Henry Graff make the following observation:

*It is from historical scholarship that the world has taken the apparatus of footnotes, source references, and bibliography, which validate what is stated. It is from writers of history that others have learned to sift evidence, balance testimony, and supply verification. (Barzun and Graff,2004)*

Indeed, Barzun and Graff’s quoted statement suggests that history writing set the original standards of accuracy for any kind of report writing. In sum, if a novice researcher is confused about the differences between writing history versus writing fiction at a theoretical level (perhaps at the level of strategy), it is at the tactical level that the differences clearly stand out. The discipline of collecting and interpreting data in historical research, guided by the researcher’s “historical imagination,” is quite intense. (Table 02) outlines some of the themes covered in Barzun and Graff’s book; which highly recommends the book itself as a guide for conducting history research at the tactical level.

Identification	Organization	Evaluation/Analysis
Facts versus ideas	Researcher’s mind	Audience
Fact finding	Accuracy	Attribution
Being a detective	Love of order	Clarification.
Library	Logic	Check for falsification
Internet	Honesty	Bias
Catalogues	Imagination	Self-criticism
Encyclopedias	“Cross-questioning”	
References	Compilation	
Chronology	By topic	
Maps	By time	
Current opinion	By internal logical order	
Colleagues, “experts”	Verification	
Note taking	Composing	
	Paragraph, chapter, part	
	Use plain words, sentences	
	Tone and rhythm	
	Art of quoting	

**Table 2: A representative list of tactical concerns in history research mentioned in Jacques Barzun and Harry F. Graff, *The Modern Researcher*, 6th ed. (2004),**

Source: Groat and Wang, 2013.

In distinction to categories of handling the evidence (identification, organization, evaluation), there are some categories for types of evidence: determinative, contextual, inferential, and recollective evidence. The following example “Inca Quarrying and Stone Cutting” By Jean - Pierrerotzn itemizing eight different tactics. This example consider how interpretation permeates the entire process. Particularly in terms of the four evaluative categories which have mentioned here. The tactics are,

Tactic 1: On-site familiarity.

Tactic 2: Use of documents.

Tactic 3: Visual comparisons.

Tactic 4: Material evidence.

Tactic 5: Comparison with conditions elsewhere.

Tactic 6: Local informants and lore.

Tactic 7: Reenactment/testimonial.

Tactic 8: Identification of remaining questions.

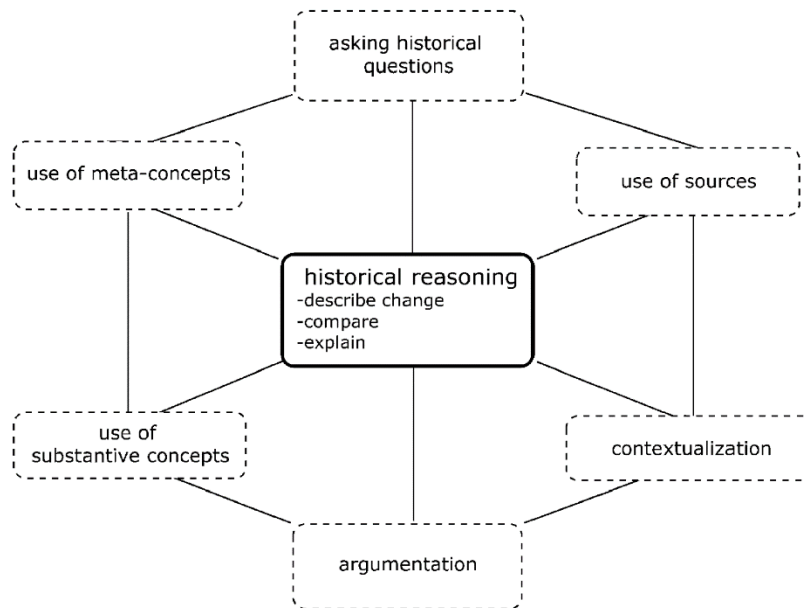
## 2.4 Strengths and weakness.

Strengths	Weaknesses
Historical research remains a storied and elevated mode of inquiry. As noted by Barzun and Graff, its standards of reportage have traditionally set the standards for documentation, citation, format, and so on, for other modes of qualitative writing.	As noted throughout this chapter, history is an interpretive enterprise, so that any one particular study on a topic is no doubt one point of view on that topic. For those digesting a historical narrative, then,
History is also a unique mode of inquiry in that it is probably the only research strategy whose topic of inquiry does not “exist” in any empirically accessible way. Of course the advantage of art-architectural history research is that the artifact in question is often still with us in some form.	It is necessary to weigh not only the report itself, but also the theoretical frame of the analyst.
History at the tactical level is commonly used in other research strategies, so the how-to’s of data procurement are important to know even for researchers using other strategies.	Multiple histories of any one topic are probably needed for a full-orbed account of that topic.

*Table 3: Strengths and weaknesses of historical research*

Source: (Groat and Wang, 2013)

## 2.5 Theoretical framework for historical reasoning from the past



*Figure 12: Presents in a schematic form the framework of historical reasoning we developed. The framework comprises six components.*

Source: (Drie & Boxtel, 2007)

**(a) Asking historical questions:** Asking historical questions in the context of historical reasoning concerns asking descriptive, causal, comparative, or evaluative questions about historical phenomena and about the sources that give information about the past.

**(b) Using sources:** The use of sources in the context of historical reasoning as the evaluation of sources (e.g., their usefulness, trustworthiness) in relation to the question at hand and the selection, interpretation, and corroboration of information from sources in order to answer a historical question or to provide evidence for a claim about the past.

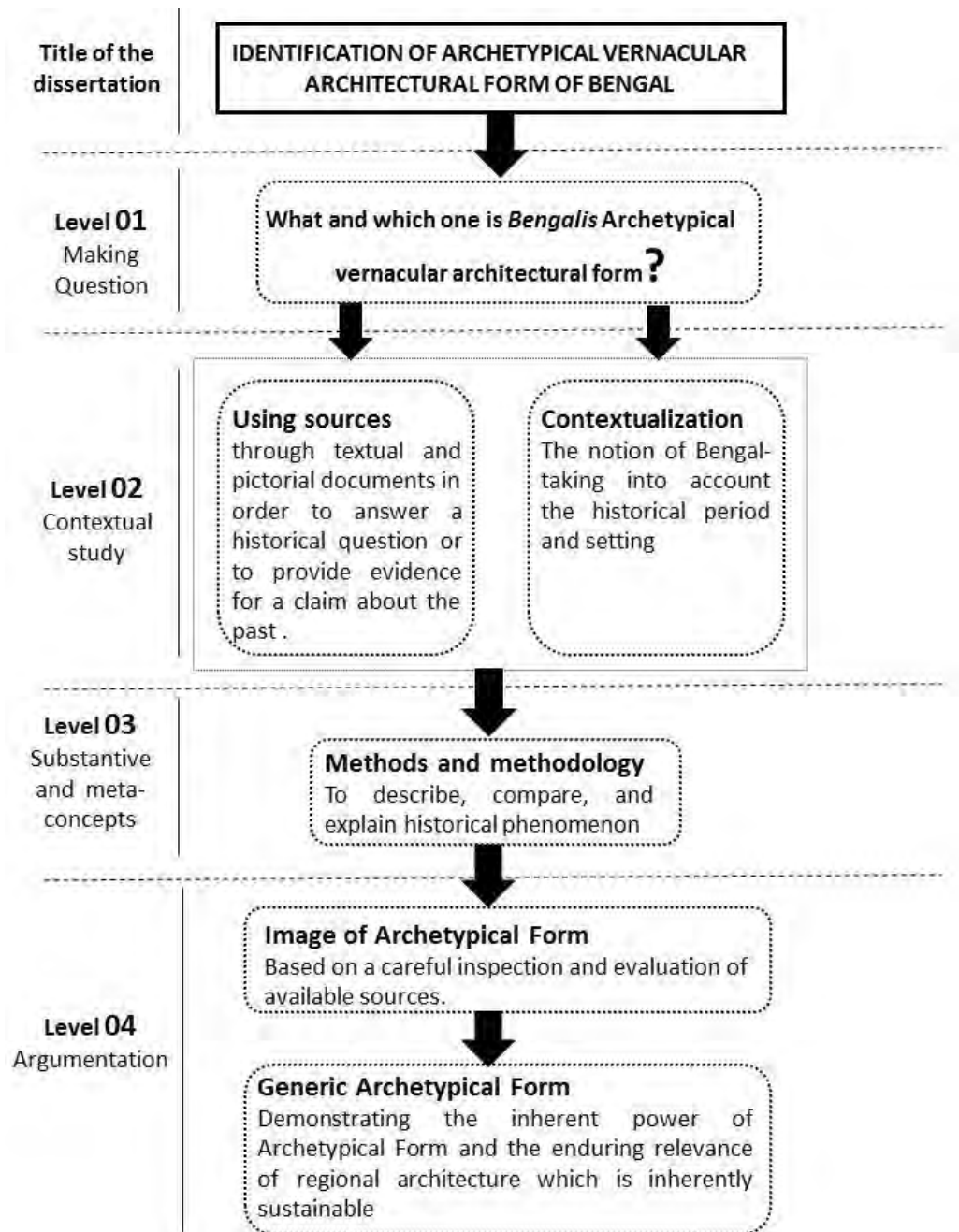
**(c) Contextualization:** In the framework of historical reasoning contextualization is defined as situating a historical phenomenon, an object, statement, text, or picture in a temporal, spatial, and social context in order to describe, explain, compare, or evaluate it.

**(d) Argumentation:** As a component of historical reasoning, argumentation concerns putting forward a claim about the past and supporting it with sound arguments and evidence through weighing different possible interpretations and taking into account counterarguments.

**(e) Using substantive concepts:** Using substantive concepts in historical reasoning concerns the use of concepts that name historical phenomena, persons, and periods when organizing information about the past in order to describe, compare, and/or explain historical phenomena.

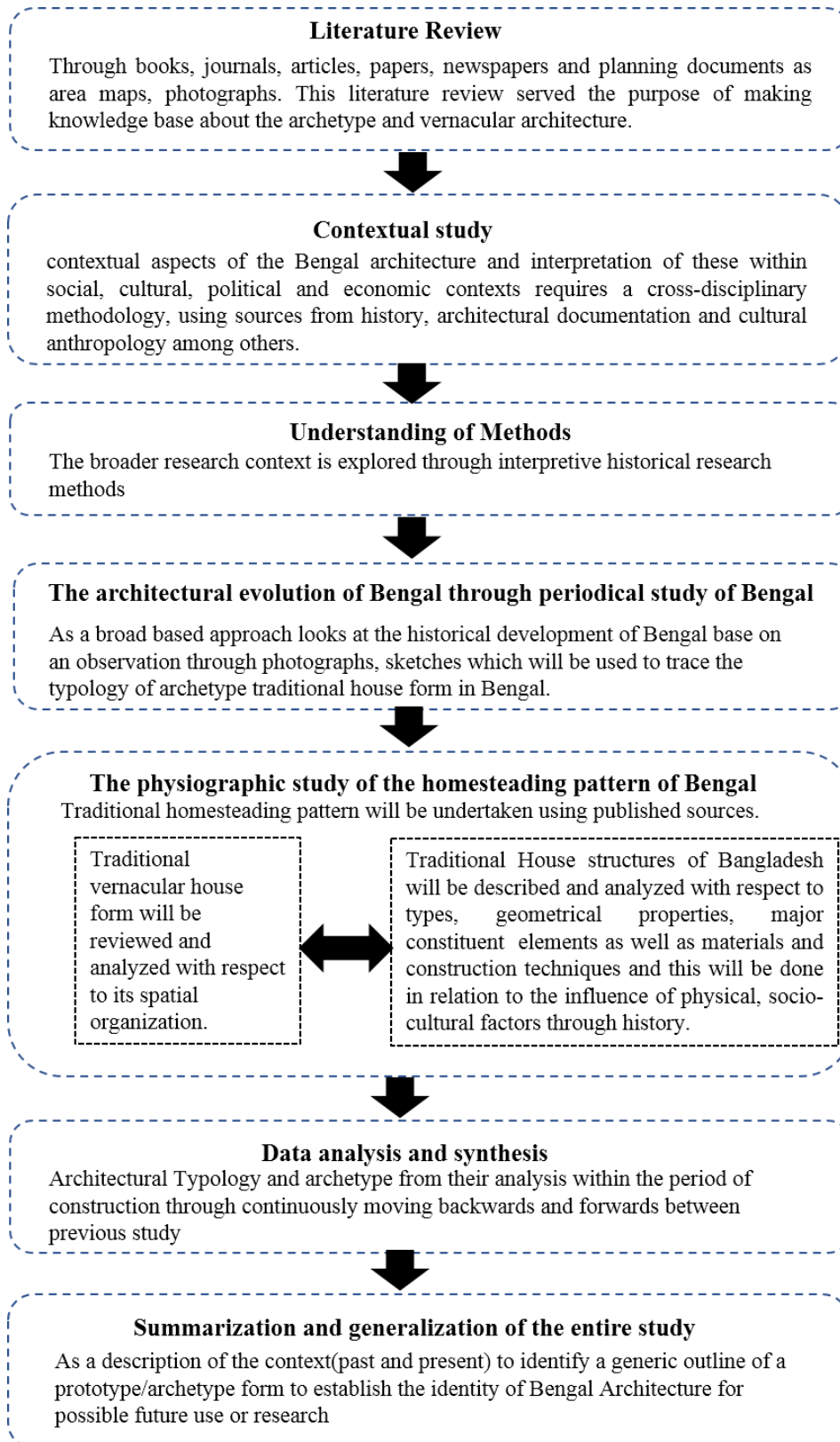
**(f) Using meta-concepts:** Using meta-concepts in historical reasoning involves using heuristics related to (a) the description of processes of historical change, for example distinguishing change and continuity, gradual and sudden changes, and political, economic, social, and cultural changes; (b) the comparison of historical phenomena, for example distinguishing similarities and differences and unique and generic aspects; (c) the explanation of historical events, for example the identification of multiple causes, types of causes, relationships between causes, and of long term and immediate consequences; and (d) the use of sources providing information about the past, for example evaluating the trustworthiness of the source and corroborating information from different sources (see also the section about the use of sources).

We define historical reasoning in the context of history education as an activity in which a person organizes information about the past in order to describe, compare, and/or explain historical phenomena. From the literature on the components of historical reasoning we conclude that skilled historical reasoning can be described as reasoning which reflects contextualization or taking into account the historical period and setting, the use of substantive and met concepts to describe, compare, and explain historical phenomena, and sound argumentation based on evidence from sources that give information about the past, a careful inspection and evaluation of available sources. The developments of the recent decades show that “context” as a theory and placed an emerging stem in social study, environment, economics research as well as architecture.



*Plate 1: Framework of the Research*  
Source: (Prepared by Author)

## 2.6 Approach to the thesis and Methodology



*Plate 2: Methodology of the Research*

Source: (Prepared by Author)

## **Chapter 03**

## **Historical Survey of Bengal**

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**“Identification, analysis, and documentation through a periodical survey of Bengal.”**

### **Content**

- 3.1 Pre/Proto-History of bengal**
- 3.2 Prehistoric dwelling in bengal: “primitive hut”**
- 3.3 Early History: The Begining**
- 3.4 The Aryans: Anthropological Assimilation**
- 3.5 Aryanism in Bengal**
- 3.6 Central Asian Influence**
- 3.7 European Modern Influence**
- 3.8 Contemporary Adaptation**



### 3.1 Pre/Proto-History of Bengal:

The of architectural development in the region of Bengal has been defined as an indigenous form of the building art particularly expressive of the inhabitants of these parts. Constructed sometimes of laterite, but generally of brick, and so actually molded out of the very composition of the earth from which these agriculturists wrested their living, it speaks of the soil itself, and few things can be more fundamentally influential than the nature of one's native soil. Obviously originating from a somewhat primitive and cabin-like structure it gradually evolved into a system derived from the wooden houses and bamboo thatched huts of the ancestral forest dwellers. This is shown especially in the sloping roof, curved eave, and other similar features, which could only be the result of long years of building in timber and bamboo. Such expedients are the logical outcome of a mind indigenous yet practical, a consciousness which concerned itself mainly in dealing with the elements or powers of nature as these affected the course of daily life by the profound reality of their existence.

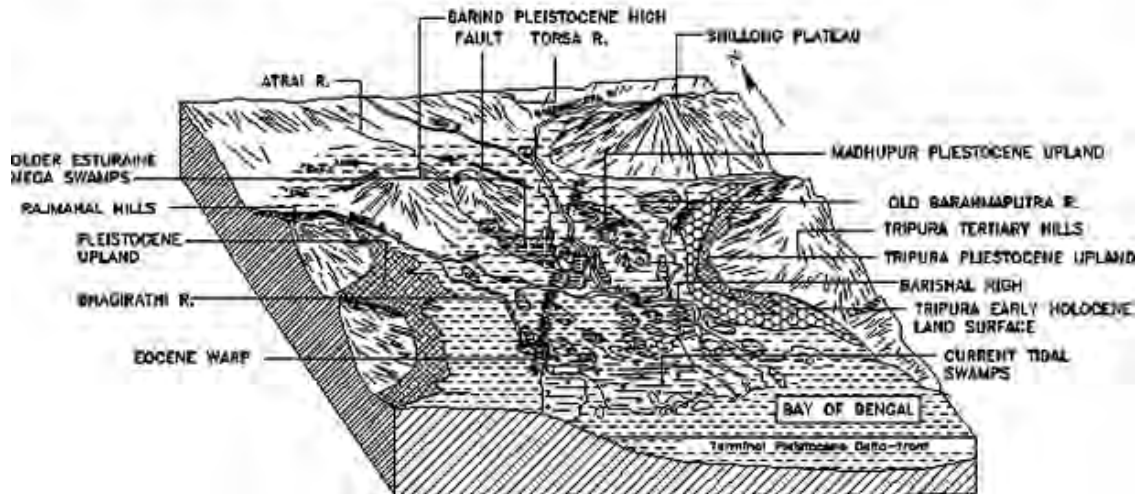
Our knowledge of the prehistory of Bangladesh is still very slight. It is certain that the earliest inhabitants of Bangladesh consisted of bands, that is, mobile groups of people, A band is a small-scale society of hunters or gatherers, who are generally fewer than 100 people. The band members are generally kinsfolk, related by descent or marriage. They have no formal leaders. There are no marked economic differences or disparities among the band members. They cannot settle anywhere permanently as they have to move from place to place in search of wild (undomesticated) food resources. As a band is composed of a mobile group of people, their sites consist mainly of seasonally occupied camps.

#### 3.1.1 The formation of Bengal Basin

Continuous sedimentation of the Ganga-Brahmaputra and pre-Ganga-Brahmaputra river system since the Miocene period and neo-tectonics shaped the present form of world's largest delta, also known as the Bengal basin. It covers most parts of West Bengal and present-day Bangladesh. For hundreds of thousands of years, the fertile Bengal was covered by dense rainforests and wetlands, an environment of high biodiversity. Much of it survived well into historical times. The decline of the Bengalian rainforest was directly related to the success one of its denizens: man (Schendel.2009). the Bengal basin is the fractured northeastern portion of India sunk below sea level sometime after the collision of the Indian Gondwana with the East Asian and Eurasian plates in Eocene period (54 to 38 million years ago).in the subsequent period the basin was filled up by the alluvial soil brought by the rivers. It is believed, though much debated, that most of the Bengal basin formed on the reversal of the indo-brahmin in the Pliocene period (7 to 25, million years ago) and the Pleistocene period much of the basin was completed. But the remnants of the Pleistocene deposits in the country are the barind tracts of the northern region and Madhapur tracts of the central region. Most of the deltaic southern part of Bengal basin, a major part of which lies in Bangladesh, is not more than 10,000 years old (Rashid,1981) (Fig.13).

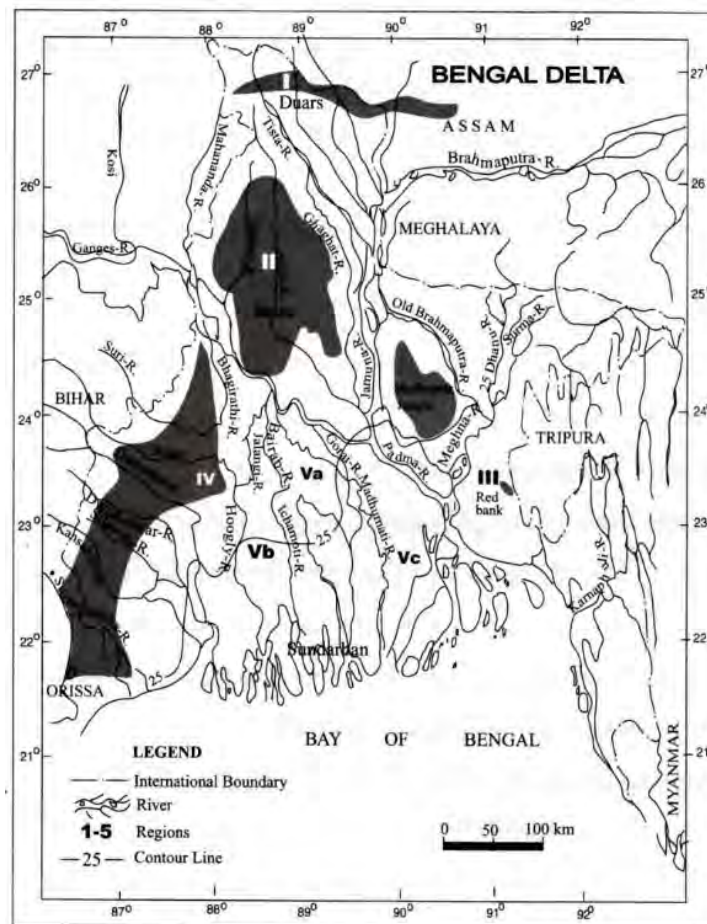


Schematic Profile of Development of Bengal Basin through terminal Pleistocene-Holocene depositions.



*Figure 13: Geo-features of Bengal*  
Source: (Rashid,1981)

### 3.1.2 Human occupation in prehistoric Bengal



**Map 2: Sub-regions of Bengal Delta**

*I. The sub-montane terai, here known as the Duars., II. The northern Para delta, or the Ganga-Brahmaputra Doab and the Barind. III. The Eastern Margins. IV. Rarh plain or the Western Margins of the Delta. V. The Ganga Delta proper (a. Moribund Delta, b. Mature Delta, c. Active delta*

Source: (M.M Hoque,2002)

Bengal delta is an area of 2, 07,000 square kilometers covering deltaic parts of West Bengal and Bangladesh. (Early Period) Human settlements in Bengal has an antiquated history. The present vegetation cover and the landscape indicate several millennia of human activity and interference, and they have derived their character from the pattern of human settlements and agriculture. The land elevation pattern of Bengal acted as an important factor in the initial stage of settlement development in the area, since the greater part of the riverine, wet and low-lying plains must originally have consisted of forest and marshes and were infested with killer animals throughout the prehistoric period. Even in the historical past, a major part of the area was initially unsuitable for human occupation. As late as the Mughal period, much of the Gangetic plain was under forest, and human occupation was quite slow to penetrate into such lands. Thus, relatively older and elevated areas were considered to be the places of early human occupancy in Bengal. Tertiary Hills (66 to 2 million years before with an average height of 300m above mean sea level- MSL) and the Pleistocene Terrace (2 to 0.1 million years before and an average 1.5 to 6 m higher than the level of the lands formed in the Recent Age, it is even 15 to 30 m higher than the MSL on the western part of the Barind Tract ) were possibly relatively accessible to human occupancy in the first stage of settlement development (Map 2).



**Map 3: Prehistoric archeological sites in Bengal**

Source: (Alam, 1982)

Evidence of prehistoric and protohistoric human habitation and culture have been discovered in many parts of the Bengal basin (Map 3). Recording of 162 lower Paleolithic sites in West Bengal province in India (Hoque,2002). clearly defines the human habitation in the Bengal basin since the earliest human occupation in South Asia. Moreover, at least 84 identified Neolithic sites (Hoque,2002). in Gangetic Plain and West Bengal indicate the sedentary settlements and well as the continuation of Chalcolithic and urban culture in Bengal Delta. Prehistoric data from present Bangladesh region, especially stone and fossil wood artefacts from the Lalmai hills of Comilla district (Chakrabarti, 2001: 32), Chaklapunji Tea Garden of Habiganj district (Roy, 2002) and Palkichara Tea estate of Moulvibazar district (Siddiq & Habib, 2016) also support prehistoric human habitation in the Delta. Yet, detail information about prehistoric life in the Bengal basin because of the unavailability of the prehistoric mound or a human skeleton. Albeit physical and linguistic anthropological studies (e.g. Gadgil *et al.*, 1998; Agrawal *et al.*, 2008; Blench, 2008) illustrate that there were multiple waves of migration as well as several ethnic groups inhabited in prehistoric South Asia, no prehistoric objects relate themselves to certain regional cultures. Following the Neolithic, there were very rich human occupations in the Delta during the Chalcolithic period (e.g. Banerjee *et al.*, 1992) and urbanization in Iron Age.

### 3.1.3 Socio-cultural formation

It is to be added here that the riverine or well-watered Bengal, the most fundamental element of the geo-features of Bengal, had played a very influential role in this process. As it is mentioned earlier most of the rivers of Bengal flowed through the laterite old alluvium, the prehistoric human habitation developed in the immediate vicinity of rivers naturally. By intersecting the land of Bengal in a variety of directions the rivers of Bengal formed a complete and easy system of navigation thereby providing remarkable facilities for inter-regional communications as well as communication with the outer world. The river Ganges by flowing over the southwest portion of Bengal made this region a part of the Gangetic valley, thereby making it possible for North Indian cultural elements to enter and influence Bengal culture. The rivers have divided the region into many divisions by forming the boundaries between its different districts and thereby to some extent have isolated one part of the country from the other which from very ancient time has been influencing its history, society, and culture (Fig 14).



*Figure 14: showing the river Ganges by flowing over the southwest portion of Bengal made this region a part of the Gangetic valley*

Source: (commons.wikimedia.org)

In the absence of written records archaeology is our best tool for gaining an insight into human activity in the remote past. In traditional archaeology, the division of the history of mankind into the four Ages of Stone, Copper, Bronze, and Iron is used to illustrate the progress of material civilization. The Age of Stone falls into three periods: the Paleolithic period (also called the Old Stone Age), the Mesolithic period (also called Middle Stone Age), and the Neolithic period (also called the New Stone Age). These three stages were first applied to the prehistory of Europe. The archaeologists studying the prehistory of Bengal do not include the Mesolithic period in the sequence of prehistoric cultures. Instead, they have subdivided the Paleolithic period, as have done many archeologists in the West, into the Lower Paleolithic period (before 200,000 years ago), the Middle Paleolithic period (from about 200,000 to 40,000 years ago), and the Upper Paleolithic period (from about 40,000 to 10,000 years ago). Beginning about 10,000 years ago, the Neolithic period began at different times in different parts of the world. The culture of the transitional period

in which both stone and copper were used is known as Chalcolithic culture. Historians, on the other hand, divide history into prehistory and history. For prehistory, they are totally dependent on archaeology. For certain civilizations or cultures, they have coined the term ‘proto-history,’ e.g., the Indus valley civilization, for which the written record has not yet been satisfactorily deciphered. (Islam,2007).



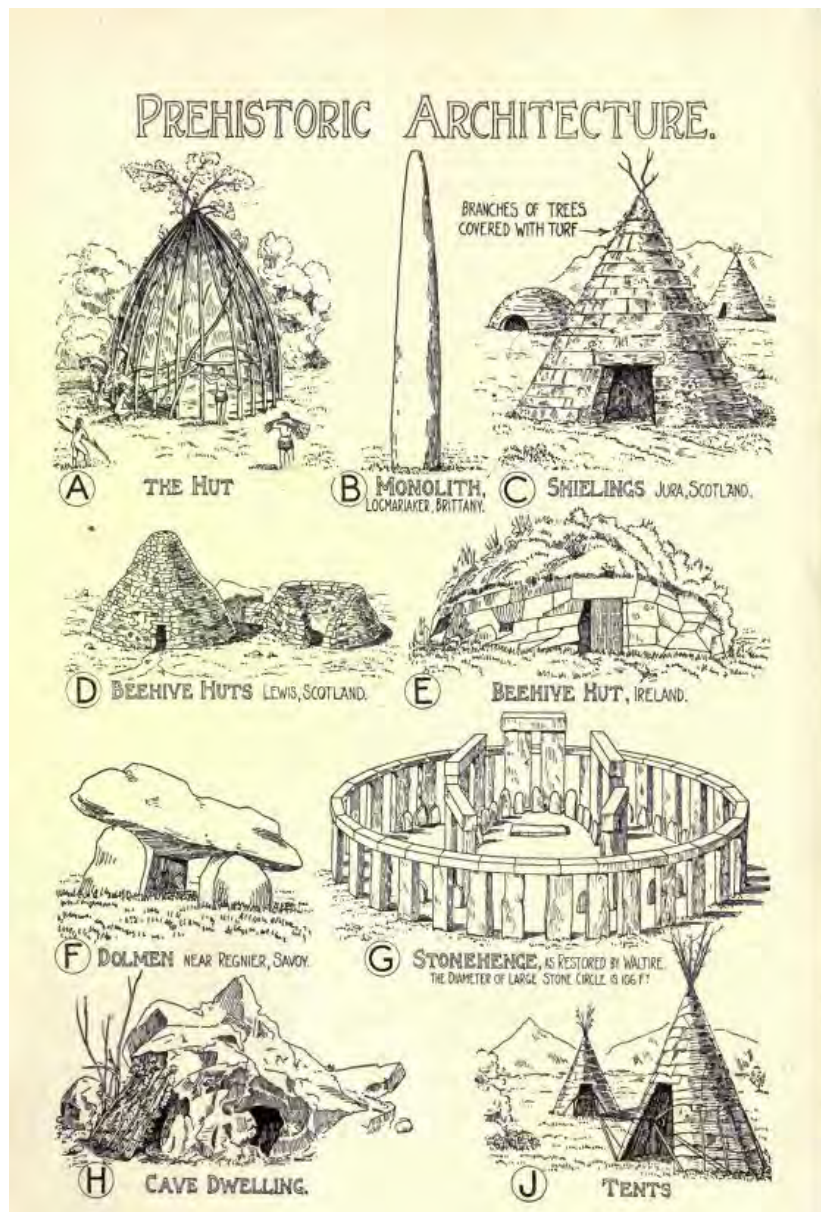
*Figure 15: People who lived on boats and subsisted mainly by fishing (The abodes of the Bedes)*  
 Source: (sketch prepared by Author)

Bangladesh was not an easy place to settle, given its thick rainforest and plentitude of wild animals. However, penetration was relatively easy through the multitude of waterways and groups living on boats would have been among the first to move into the interior. These groups were most likely from the middle Ganges valley, where the Ganges, Gandak, Gogra, Sone and other rivers provided the setting for people who lived on boats and subsisted mainly by fishing (Figure 15). None of these groups had sufficient control over resources to clear large areas of forest or organize into polities. - Wild forms of rice are found in the middle and lower Ganges valley and in many localities in South-East Asia and southern China. Moringa suggests that rice domestication began in the Himalayan foothills in the Darjeeling-Sikkim area. This was probably of the hill-as type. Gradually rice cultivation spread from Sweden’s onto the lowlands, and the main land-cultivation implement changed from the hoe to the plow. This was a change offer-reaching effects, so much so that it can be called the Rice Revolution. (Islam,2007) The earliest hint of domesticated rice is around 8500 BP. The spread of rice ushered in what the Allchin’s call the “rice-based eastern Indian Neolithic Culture”. The rice farmers became a vigorous element in transforming the landscape of Bangladesh. Choosing the highest relatively flat lands at first, they pushed back the forest frontier and created small settlements. These settlements would be near waterways to benefit from both land and water communications. No doubt they traded ideas, artifacts and foodstuffs with those who had penetrated the land by waterways and others who had created small clearings in the forest for their horticultural plots (Schendel. 2009).

### **3.2 Prehistoric dwelling in Bengal: “Primitive HUT”**

Habitation is a basic need of human beings. In the Prehistoric Age, human beings were very much dependent upon the mercy of nature. In order to save themselves from the hostilities of nature, such as storm, rain, snowfall, sunlight, flood, etc. and from the attacks of ferocious animals, they had to take shelter in the holes of big trees. As a consequence, permanent human settlements developed on the banks and adjacent regions of the Euphrates and the Tigris of present Iraq in approximately

10,000 BC. The evidence of the first ever permanent settlement in the subcontinent has been discovered in Mehrgarh, which belongs to about 7000 BC. For this purpose, people of that time primarily used sun bricks; and later came the use of baked bricks. Owing to the unavailability of hills and mountains, cave-dwelling is rarely evident in Bengal. Yet, a cave dwelling of the Stone Age has been discovered at a place called Laljal situated at Jhargram in Medinipur district. Human skeletons, stone-tools of the primitive people, and cave-arts have been discovered here. Though permanent human settlement evolved in Bengal in the last phase of the Stone Age, it has not been possible to know about the architecture of that period due to the lack of authentic information (Datta,1990)

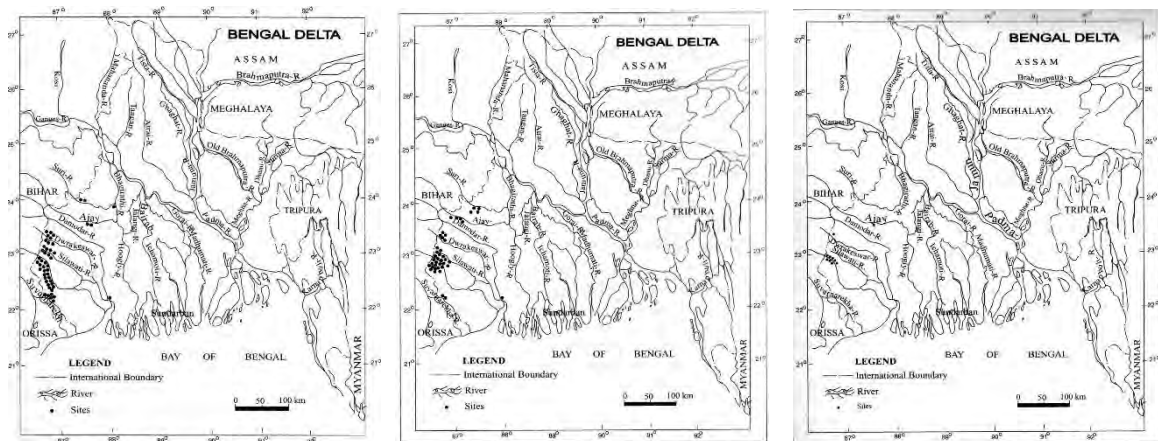


**Figure 16: prehistoric architecture**  
 The 'Hut' type 'A' resembles the Bengal context on a raised ground.  
 source: (Fletcher,1905)

The origins of architecture, although lost in the mists of antiquity, must have been connected intimately with the endeavors of man to provide for his physical wants. It has been truly said that

protection from the inclemency of the seasons was the mother of architecture. According to Vitruvius, a man in his primitive savage state began to imitate the nests of birds and the lairs of beasts, commencing with arbors of twigs covered with mud, then huts formed of branches of trees and covered with turf (Fig. 16 C). Other writers indicate three types of primitive dwellings the caves (Fig. 16 H) or rocks or those occupied in hunting or fishing, the hut (Fig. 16 A, D, E) for the agriculturist, and the tent (Fig. 16 J) for those such as shepherds leading a pastoral or nomadic life. These foregoing primitive or prehistoric remains have little constructive sequence, and are merely mentioned here to show from what simple beginnings the noble art of architecture was evolved, although unfortunately the stages of the evolution cannot be traced, owing to the fact that the oldest existing monuments of any pretension, as in Egypt, belong to a high state of civilization. However, contextual and circumstantial evidence points this in Bangladesh, before settled life started, the shelter was a set of 'tents' or 'boat houses. When the settled life started with the 'rice culture' the tents and boat houses transformed into huts on higher grounds. Human colonization in Bengal encompasses a span of at least half-a-million years and is divided into two broad periods, namely the prehistoric (before the emergence of writing) and the historic (after writing). Economically, the prehistoric Paleolithic and Mesolithic periods represented a nomadic, hunting-gathering way of life, while the Neolithic period represented a settled, food-producing way of life.

### 3.2.1 Paleolithic period



*Map 4: Showing the Lower, Middle and Upper Paleolithic sites in Bengal Delta*  
Source: (M.M Hoque,2002)

Available evidence indicates that during the Pleistocene period, Paleolithic culture was present in the older and the low mountainous areas in and around the region now forming Bangladesh. It also seems that the Barind Terrace may have been one of the few places where settlements first developed. The south was either marshy or estuarine and deeply forested and unfit for human habitation for long. Settlements have been most unstable as a result of channel shifting of the Ganges-Brahmaputra systems. However, it is assumed that fairly old and built-up settlements developed in ancient times in areas now known as the Moribund Delta, due mainly to their agricultural potential and related economic reasons. But the actual period of the development of human settlements in this part of the country is very difficult to ascertain.

All the three stages of Paleolithic culture i.e. Lower, Middle and Upper Paleolithic cultures are now well established in Bengal. Evidence of the Paleolithic culture of West Bengal has been reported from the southwestern part of the state. Out of the 100 reported paleolithic sites, 49 belongs to



lower, 41 to middle and 10 to upper paleolithic culture. These sites are found mainly in the western region of *Rarh* plain, above 50m contour line (Nag, 1987) and they are located mainly on hill slopes, foothills, elevated tracts and on river banks (Gosh, 1966) spatial distribution of sites shows that almost 98% of Paleolithic sites are located on the *Rarh* plain (Map.04) and only 2% sites are seen in the active delta (24-Parganas district). In the *Rarh* plains, paleolithic people preferred to occupy, reason was availability of good perennial water sources of Rivers (graphene, kansabati, Suvarnarelekha, Kumari, Dulung, Silawati, Gandheswari Dwarakeswar); their enormous rain gullies, *nalas* and lakes, narrow flood plain; undulating but gentle slopy landscape; easily available stone materials on the surface as well as on the river banks for fashioning tools; good habitat for hunting, gathering, procuring aquatic creatures and for sustainable living. Paleolithic people preferred to settle on this part of the *Rarh* region.

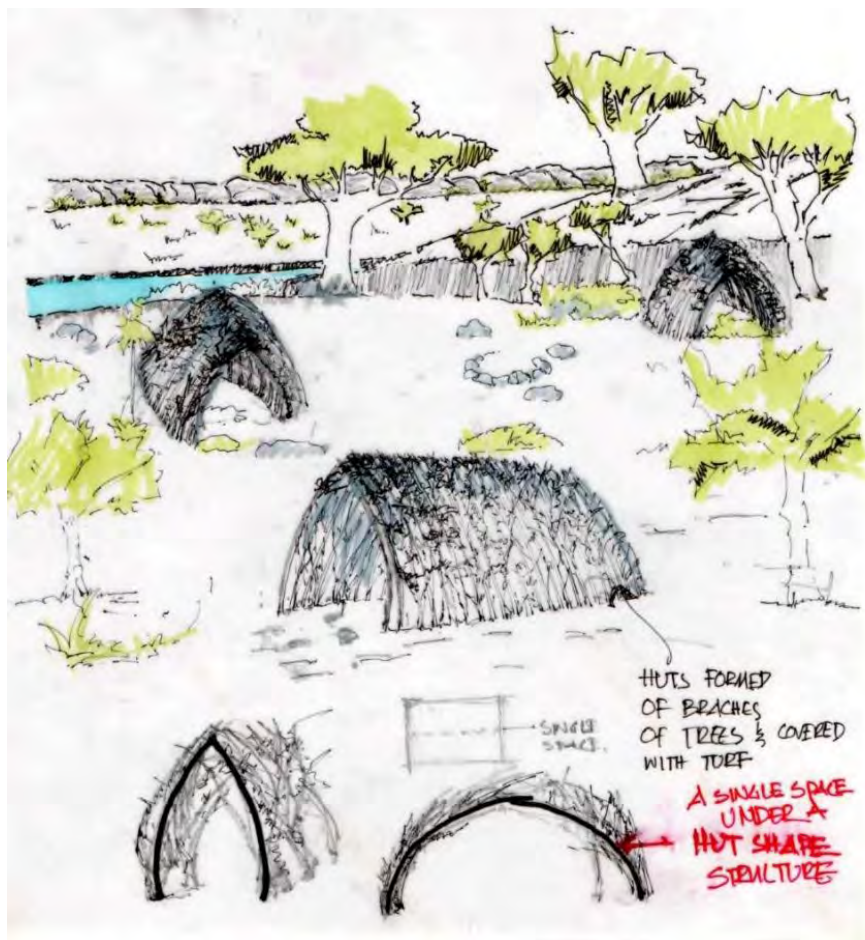


Figure 17: Temporary shelters of the Paleolithic people who lived mostly along the riverbanks.

Source: (Prepared By author)



**Figure 18: Reconstruction of dwelling structure of the upper paleolithic stage**

Source: (Misra,2001)



**Figure 19: Reconstruction of upper paleolithic earth house**

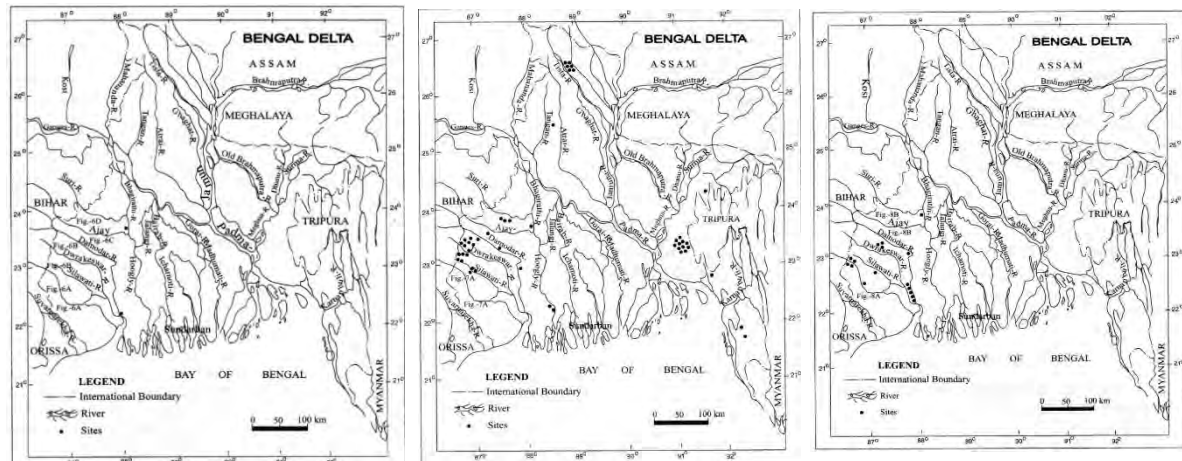
Source: (Misra,2001)

Lower Paleolithic people of Bengal used stone implements like a chopper-chopping tool, hand ax, cleaver and scraper to maintain their livelihood considered as heavy-duty tools and those might have been used for cutting or smashing food. Cleavers having wide working edge might have been used for breaking bones or branches of trees for fashioning wooden stick or tool. Middle Paleolithic people of Bengal were more efficient on food processing, food gathering, food hunting and tools manufacturing than their predecessors. There are few upper paleolithic sites in Bengal and those are located on the Kansabati, Tarapheni, Dulung, Gandheswari and Ajay rivers. Among the sites only one has been excavated by A. Datta and D.K. Ray (Datta and Ray,1989) which is situated on the elevated left bank of a small *nala* which joins a small stream that meets the Tarapheni river. Primitive man probably inherited from his primate and other distant ancestors a tradition of nest-building that he could easily adapt to his need and environment. It is not possible to trace any remains of man's earliest efforts to provide shelter for himself since the earliest representatives of mankind could have used only perishable materials for the construction of such shelters. But it is very likely that primitive shelters (Huts) formed of branches of trees and covered with turf (Fig.17,18& 19).

Evidence suggest Upper Paleolithic band of Bengal made a territory for their year-round livelihood. Again, artifacts and their variations suggest that upper paleolithic people of Bengal obtained a certain level of efficiency in hunting, gathering, and food processing system and could provide a sustainable life way for their populace. The Paleolithic assemblages are mostly surface scatters, which indicate, as in Bihar, that these sites were probably temporary shelters of the Paleolithic people who lived mostly along the riverbanks. The Paleolithic culture is marked by a rapid technological advancement as well as the first expression of man's imaginative power and artistic talent. The hunters-gathers had the knowledge of fire making, cooking and the production of artifacts. Despite great regional variations, the chief diagnostic trait of this period is the lithic blade tool technology and economic way of utilizing the raw material by knapping a series of elongated parallel-sided blades from prismatic cores. These blades are subsequently finished into various forms such as backed knives, backed points, scrapers, awls, etc. However, tools on flake-blade also form an important component of the industries. The Paleolithic populations occupied varied ecological settings. In some parts of the world, Paleolithic hunters and gatherers have survived into the present. The Bushmen of the Kalahari Desert in Southern Africa and the Australian aborigines are two excellent examples. Their economy and material culture have given us valuable insights

into prehistoric lifestyles. Many archaeologists have turned their attention to “living archaeology” or ethnoarchaeology, examining the remains of recently abandoned camps and comparing them to prehistoric settlements in different parts of the world. The objective is to develop viable analogs from close observation of living hunters and gatherers to give support to the interpretation of prehistoric sites and settlement patterns Which can provide valuable insights relevant to the Paleolithic societies in the remote past.

### 3.2.2 Mesolithic period (Approx. circa 4000 BCE)

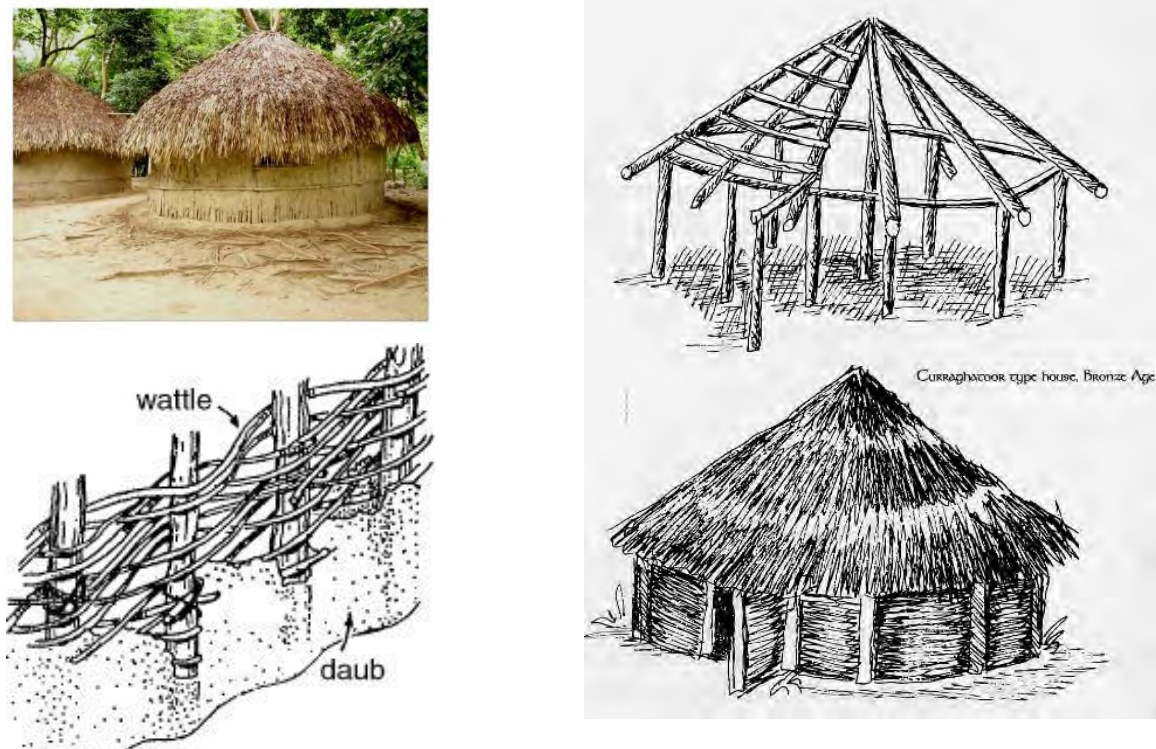


Map 5: Showing Mesolithic, Neolithic and Chalcolithic sites in Bengal

Source: (M.M Hoque,2002)

Mesolithic sites of this region have yielded lithic assemblage of both non-geometric and geometric types (Map 5). Archaeologists assumed that hunting-gathering based economy got maturity and agriculture-based economy introduced in this phase only. The lithic industry of the Mesolithic culture in Bengal delta is essentially non-geometric and the Mesolithic people of the region built circular huts at their settlements. The stratigraphy and typo-technology of Mesolithic tools suggest that circa 4000 B.C or even earlier time Mesolithic occupation took place in this ecological niche. The distribution of sites indicates that Mesolithic people occupied mainly south-western plateau fringe region of West Bengal i.e. an extension of the Chhotonagpur plateau. Mesolithic sites of the region yielded lithic assemblage of both non-geometric and geometric types (Hoque,2002).

Most of the Mesolithic sites are located on the undulating land surface of *Rarh* plain. Only a few sites are located in the delta proper. The sites are concentrated in the upstream part of the rivers and tributaries and *nalas* and can be categorized into clustered occurrences and sporadic occurrences. Mesolithic people of the region used locally available raw materials for fashioning tools. Excavation at Birbhanpur also revealed ten post holes of two sizes. Through the holes did not make any clear-cut plan. But suggests that Mesolithic people were capable of erecting ‘wattle-and-daub hut’ for shelter (Fig 20).



*Figure 20: Mesolithic circular hut*  
(Source: Misra,2001)

### 3.2.3 Neolithic period (In between circa 3<sup>rd</sup> millennium B.C. and third/second century B.C)

Neolithic occupation in Bengal delta is less but widely distributed in all over the landscape in comparison to paleolithic and Mesolithic settlements. Among all these sites as many as located in the rear plain, in the eastern margins, in the north-Bengal plain and in the delta proper. The distribution of sites suggests that sites are located above the flood-prone zone. The Neolithic population of eastern margins sub-region fashioned their implements on fossil wood. The presence of the sites in the whole delta indicates the Neolithic population extensively and more effectively colonize the region than by the Paleolithic and Mesolithic people. The Neolithic phase of Bengal delta can be placed between circa third millennium B.C. and third/second century (Hoque,2002). One of the earliest and most dominant living traditions emanates from the rice-eating habit of the Bengalis. Rice, a cereal grain, is their staple food. It is no wonder that rice fields dominate the landscape of Bangladesh and that rice often dominates people's thoughts and behavioral patterns. The rice-eating habit of the people goes back to the Neolithic period. At Lalmai hills artifacts were found embedded within the top surface or slope of the hillocks (Fig.21). The landscape is basically a rolling upland interspersed by depressions between the ridges. It would appear that the major part of the Lalmai hills has been blanketed by Madhupur clay formation. Erosion has removed part of it. The vegetation cover of the area is severely denuded by the ongoing cultural system. However, its early traces still survive in the form of xal trees, bamboo groves, mango and jackfruit trees, etc. In the remote past, all Neolithic societies were segmentary societies. They are either settled farmers with an economy based on food production and domesticated animals or pastoralists with a very different economy based on the intensive exploitation of livestock/ fisheries. The typical settlement pattern for a segmentary society is a cluster of agricultural homesteads in a number of isolated or

contiguous villages. A segmentary society, also known as a tribe, is larger than a band, though it rarely numbers more than a thousand. Their diet or subsistence is based on cultivated plants and domesticated animals. During prehistoric periods, tribal groups probably used the area for slash-and-burn agriculture (Fig.22).



**Figure 21: Pleistocene landscape, Lalmai, Comilla (Context of Neolithic tool occurrence)**

Source: (M.M Hoque,2002)



**Figure 22: Preparation of slash and agriculture**

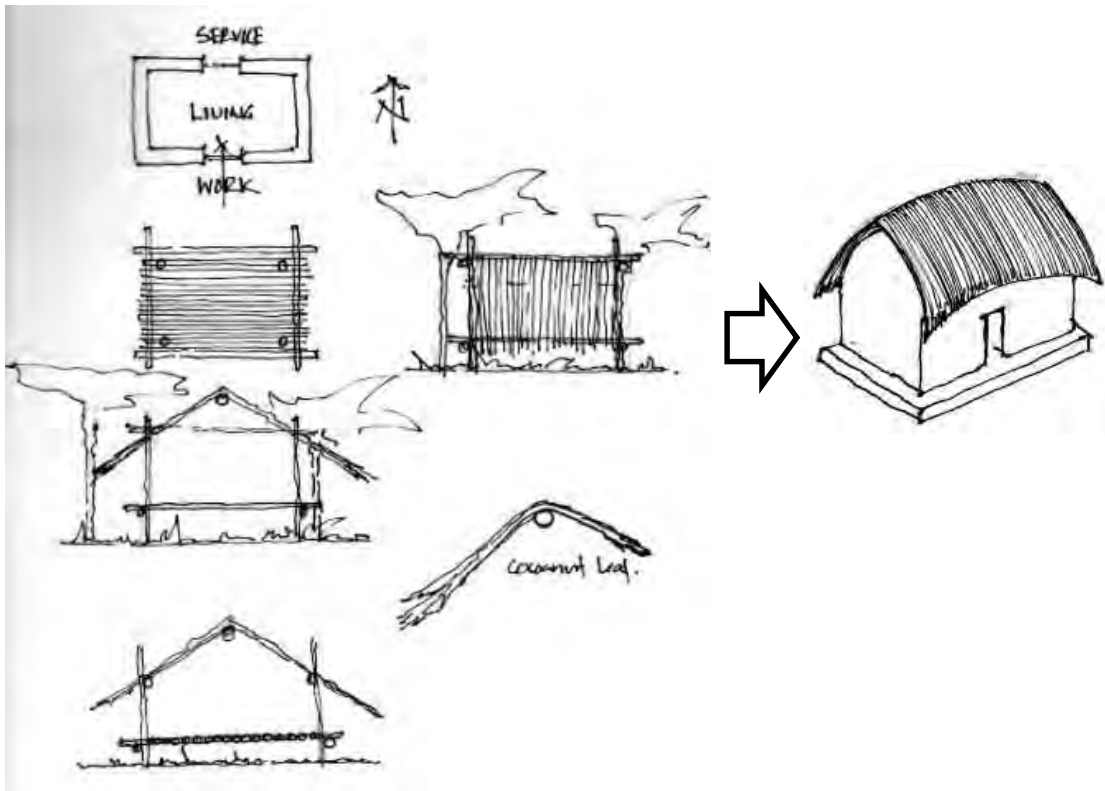
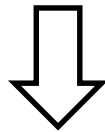
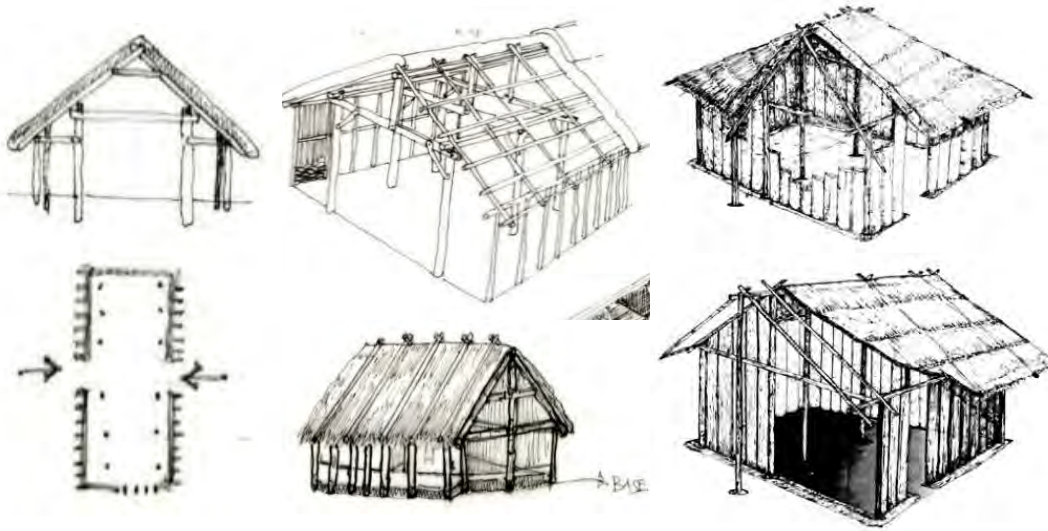
Source: (Misra,2001)

Slash and burn or shifting or Sweden practice of clearing forest for cultivation, locally known as jhum is the most common agricultural practice in Northeastern tropical hilly regions. This type of agriculture requires limited tools and equipment and entirely depends on the climatic or environmental situation for which it can be considered as a very primitive agricultural practice. The archaeological finds in many parts of the world indicate either a dispersed settlement pattern consisting of isolated, permanently occupied houses in one or more villages or a nucleated settlement pattern comprising a collection of free-standing houses in several villages. According to Gordon Childe (1936, 1942), one of the archeologists of twentieth-century mentions that each Neolithic culture represents an approximate adaptation to a specific environment with an ideology more or less adequate for it (Ibid., 70). Based on our understanding of the environment of this deltaic country, we can only assume that such living traditions as carpentry, farming, stockbreeding, pottery, image-making in clay, basketry, cooking, fishing, and boatbuilding have come down to the Bangladeshis from their Neolithic ancestors (Fig 22& 23).



**Figure 23: It is the reflection of ecological adaptation and is ideal for an understanding the man-environment relationship in high altitudes.**

Source: (Misra,2001)



**Figure 24: Reconstruction of Neolithic Village Hut**  
 The types of houses built by primitive peoples differ widely, being completely dependent upon the type of the “cutting tool” which the people possess and on the type of “landscape” in which they live.  
 Source: (Prepared by Author)

### 3.2.4 Chalcolithic period (Mid 2<sup>nd</sup> millennium B.C and the later half of the 1<sup>st</sup> millennium B.C)

The development of Chalcolithic settlements came into notice in Bengal after the period of Paleolithic, Mesolithic, and Neolithic culture was over. It is said that the age began in the later half of 2000 BC and continued until the Early Historic period. (Rahman,2007). As a new material and this period was designated as the Chalcolithic period. The invention of agriculture, which took place about 8000 years ago, brought about dramatic changes in the economy, technology, and demography of human societies. The introduction of agriculture saw it shifting to the alluvial plains which had fertile soil and perennial availability of water.

Chalcolithic sites are found in the rarr plain. Sites are grouped into two categories: a) Clustered occurrences b) sporadic occurrences. The chalcolithic period seems to have dependent largely upon the topographic situation. Located roughly below 50 cm contour line and along river banks, suggesting consideration of adequate availability of water, land for cultivation and grazing and aquatic creatures. Settlements generally cover not more than 4 to 6 acres of land and other general arrangement is linear. Modest thatched huts-10 to 12 in number-are seemingly in 'chaotic agglomeration'. Chalcolithic people cultivated rice and domesticated cattle, buffalo. Sheep/goat and pig. Beside cultivation and domestication, hunting and fishing were also part of their life (Hoque,2002). The distribution of sites suggests that Chalcolithic people preferred to settle along the river banks but away from flood-prone areas, which is roughly below 50m contour line (Nag,2002). gradual increase of Chalcolithic occupation in the delta proper is very significant. The following factors appear to have been responsible in the selection of settlement along the river banks in the delta proper:

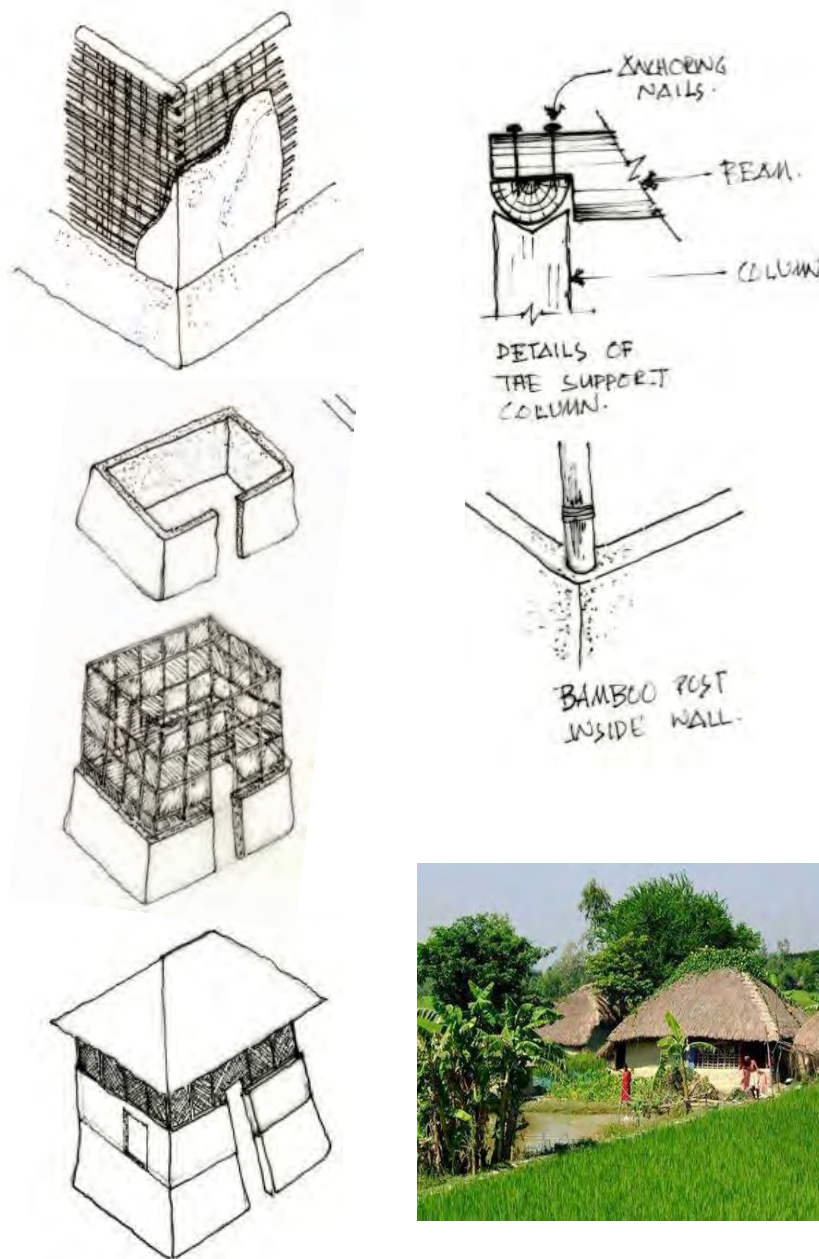
1. During the rainy season the river banks usually get flooded and new alluvium which is fertile for crop growth is deposited.
2. The land along the river banks remains under water roughly for few months due to this reason permanent vegetation cannot grow in the flood levee and without much effort, such land can be cultivated in the dry season.
3. useful raw materials like clay for making pottery is also available in the marshy area and pebbles for making stone tools are available in the river bed.
4. finally, for limited trade and intra-site communications chalcolithic population might have settled along the river bank.

The presence of huts suggests that Chalcolithic people of Bengal brought to an end of the nomadic life of their predecessors. Structural evidence comes from Mahisdal, Bahiri, Hatikara, Bharatpur, Pandu Rajar Dhibi, Mangalkot, Dihar, And Tulshipur. The remains include post-holes, remnants of burnt clay chunks with reed impression and floors. The evidence suggests that the walls of the houses were made of wattle-and-daub with clay plaster, the roofs were supported on post and floors were of well-beaten earth with soling of rammed terracotta nodules and lime. Regarding the plan of the houses at Pandu Rajar Dhibi P.K. Banerjee (Dasgupta,1964) has reported that these were round, square and oblong in shape. Th presence of ashes on the floors of these houses suggests that there were frequent conflagrations which might have destroyed the houses. there were floors of lateritic soil, sometimes scorned and sometimes hammered. In some cases, there were lime-plasters. Post-holes and hearths have also been found. They lived in modest huts, not much different from

the present-day ones. Agriculture was the means of livelihood at this time. However, sometimes it was hunting and fishing.

**‘Wattle-and-daub’ method’:**

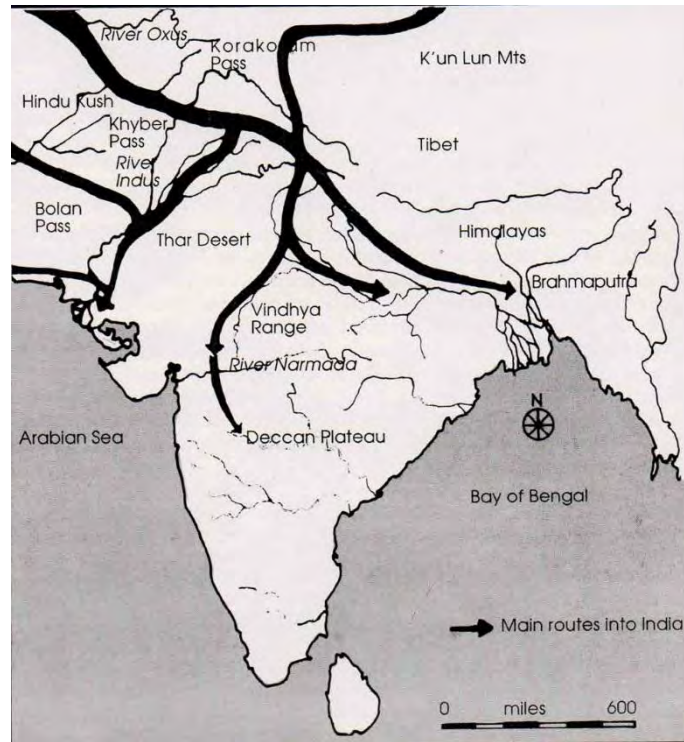
wattle and daub method (Fig.25) are an old and common method of building mud structures. There bamboo and cane frame structure that supports the roof. Mud is plastered over this mesh of bamboo cane and straws. Due to excessive rainfall, the wattle and daub structures get washed off. However, the mesh of cane or split bamboo remains intact and after the heavy rain is over the mud plastered on again. Traditional wattle and daub consist of a structure made from cylindrical wood or bamboo filled with earth and straw inside a double structure made from bamboo strips or thin canes.



**Figure 25: Chalcolithic (Wattle and Daub) construction**  
Source: (Sketch Prepared by Author)



### 3.3 Early History: The beginning



*Map 6: Routes of entry of immigrants into India from Afghanistan, Iranian and China.*  
 Source: (Grover, S: *Buddhist and Hindu Architecture in India*)

The land of *Bengal* derived from the siltation of mud and other riverine minerals and became the largest land of delta in the world. The land formation molds enormous differences in lives. A big clue always comes to the reference of the History of Ancient Indian civilization-is the Mohenjo-Daro and Harappa (Indus civilization) (Fig.26). Yes, Bengal was commercially and geographically connected with the Indus civilization. Researchers and archaeologist of our country have proved the relationship. Original inhabitants of Bengal were believed to be proto Australoid Dravidians. Indus valley civilization people were also Dravidians but the context was totally different. Gradually a small group of Aryans pushed into the Bengal basin (Map 06).

The exploration of origins reveals the motive power which gives art its initial impetus. And it is in the primitive culture of a people that these origins are to be found. Primitive art is the matrix of the higher and is the source from which more advanced forms are derived. This culture which produced the elementary type of forest-dwelling referred above appeared probably towards the end of the second millennium B.C: it was the outcomes of the great Indo-Aryan migration from the north west, and which in the course of time laid the foundations of Vedic age. That those responsible for this culture were unrelated to the people of the Indus civilization seems fairly clear, as there was a wide difference in the conditions under which each of these population existed, in their mode of life , and notably in the type of building produced by this method of living .on the one hand the inhabitants of the Indus region, as already shown, were mainly traders and town dwellers, while the Vedic people were tribal wresting their living form the fields and forests. Aryans were nomad, an offshoot of an immense and obscure migration, settling down in the flood plains of *Bengal*, became partly pastoral and partly agricultural, having their habitation's rudimentary structures of reeds and bamboo thatched with leaves. It was not therefore from the fine houses forming the towns of the

Indus civilization, but from such temporary erections as these, and the various simple expedients devised to meet the needs of the forest dwellers that *Bengal* architecture had the beginnings (Percy Brown, 1956)

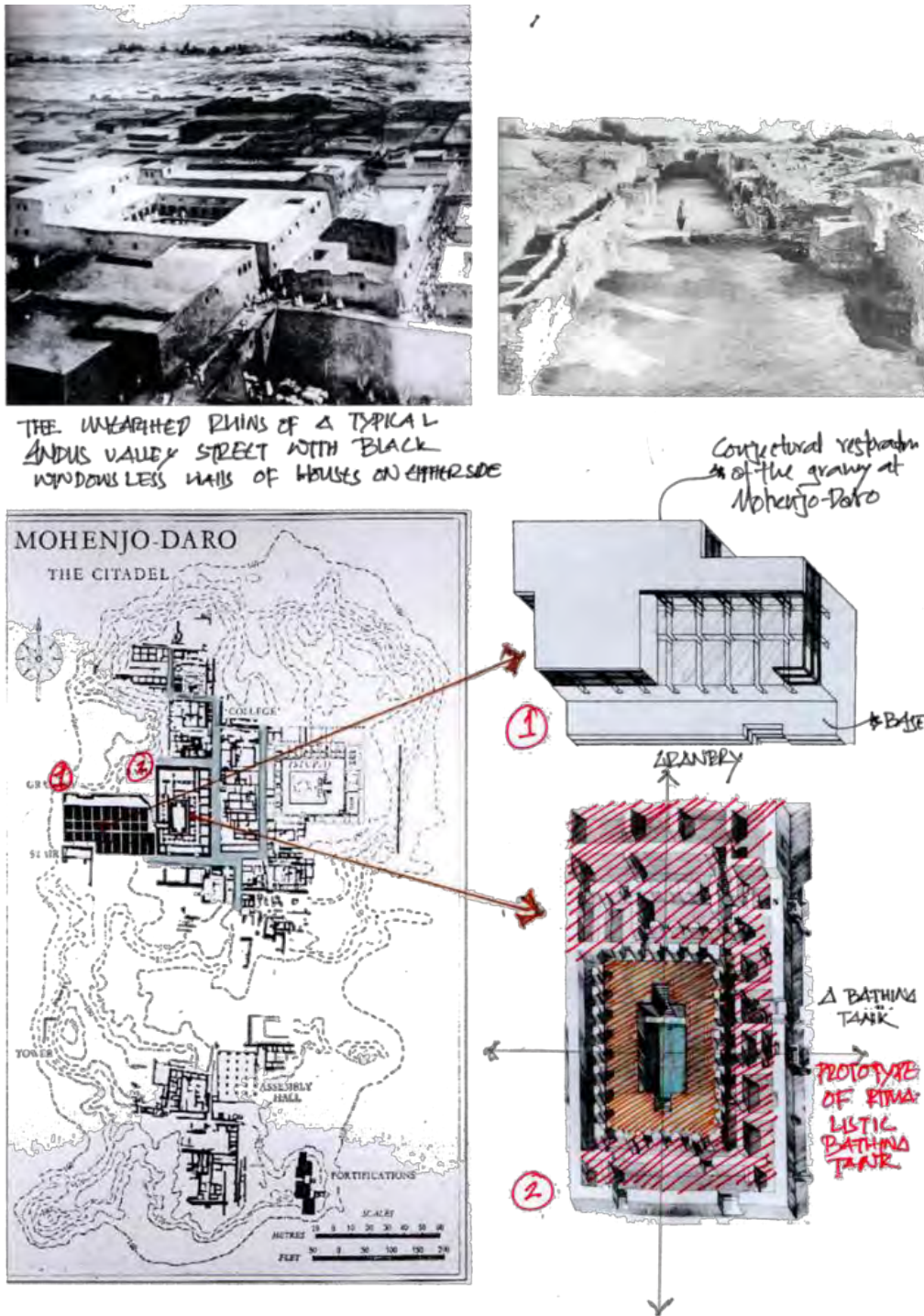


Figure 26: Mohenjo-Daro (The Citadel)  
Source: (Grover, S: Buddhist and Hindu Architecture in India).

There was no reason to wander further; the rivers assured Aryans a dependable supply of water, and the banks were ideal for cultivation. The forests around were not only an abundant source of the game, but timber as well: timber that could be used as a building material, as fuel for cooking and even, as they were soon to learn, for baking bricks to build permanent structures. During the first millennium of their settlement in the valley, the people most likely lived in the clearings reclaimed from the forests on the banks of the river. Nature was beautiful to them and the resources of the environment seemed inexhaustible and abundant. With their knowledge of cultivation not only of rice and wheat but off cotton as well, the community was able to produce sufficient agricultural surplus without undue strain, such self-sufficiency in basic necessities encouraged the growth of industries like pottery, brick-making, carpentry and weaving of cotton textiles (Grover,1996).

### 3.3.1 Mauryan Period (3rd Century BCE-Beginning of 4th Century CE)

After the Chalcolithic Age had come to an end and the Early Historic period had begun, the second phase of urbanization took place in a good number of archaeological sites, like Chandraketugarh, Bangarh, Mangalkot, Tamralipti, Mahasthangarh, WariBateshwar, etc. The architectural activities in Bengal, in about 3rd century BC, appeared almost as a fully developed art without indicating any clue regarding its formative stages. For obvious reasons, our inquiry begins from the beginning of the Maurya's. the Maurya capital city of Pataliputra (modern Patna) of 2000 years ago, stretched for nine miles along the Ganga, being only one and a half miles deep inland. The king's palace was most likely a grand version of the familiar rectangular hut of the humble village (Grover 1996). Ashoka the Great, the best-known Maurya ruler, converted to Buddhism and sent missionaries to spread Buddhist teachings elsewhere in Asia. It is assumed that just after the return of King



Map 7: Mauryan Empire

Source © Banglapedia ,National Encyclopedia of Bangladesh)

Alexander the Great to Greece, Chandra Gupta Maurya established a kingdom covering a vast part of India. It is also apparent from the Greek writings that the northern part of Bengal and perhaps the whole of the delta was watered by mighty rivers belonged to the Maurya Empire (Map 7). The recent archaeological excavations at Chandraketugarh in the north 24 Pargana District of West Bengal, and Wari-Bateswar— two villages in the Narsingdi District, and the earlier excavations at Bangarh and Mahasthangarh suggest that Bengal had connections with the Mauryan history at least from the 3rd century BCE (Hossain,2011).

It has not been possible to know much about the architectural plans, construction method and raw materials due to the insufficiency of information. Yet, clay and lime-surki floor, bamboo twig fences with mud coating (Wattle-&-daub) and terracotta tiles used in the roofs have been discovered in the excavations of the above-mentioned archaeological sites. Traces of the use of wood in the same period have been found. But it is speculated that straw, leaves, etc. were used to make the roofs of the houses. Clay was also used as the wall of the houses in the earlier period. The Chalcolithic and Early-Historic settlements of Bengal were situated in the red mud of the Pleistocene age (Varendra and Madhupur). It is speculated that mud walls had been widely used in the common houses after people started developing permanent settlements from the Neolithic age to the preindustrial revolution period (Hoque,2002).

Archeologically, developed architectural plans are found from Gupta period onwards. But some fragmentary building materials discovered from early historic archaeological sites of Bangladesh indicate that in about 3<sup>rd</sup> century BCE it was fully developed art without any clue of its formative stage. Some architectural features and materials unearthed in early historic sites of Bangladesh i.e. Mahasthangarh. Besides excavated building materials, some early terracotta's of Bengal, particularly terracotta's from Chandraketugarh of 24- Parganas of West Bengal, India, are taken into consideration to visualize the ancient architectures of Bengal. Many scholars (Biswas, Bautzen, and Haque) considered early terracotta of Bengal as a primary source to understand the early architecture of Bengal. Depiction of this terracotta helps us to view a full range of architecture of the land, which is generally not possible to view in an archaeological context. In the archaeological context, we are not able to notice all the building items. These details we see in plaques. It has been suggested that in the long run, we have unearthed only non-perishable building materials but many components of early architectures were made of perishable materials (wood, bamboo, etc.). Therefore, in the course of time, perishable parts of architecture decomposed with soil.

### **Chandraketugarh:**

Chandraketugarh is situated in the new silt-formed region of the Vidyadhari, the branch of the Bhagirathi in 24 Parganas in West Bengal and the Padma. Ideas about the aesthetic features of urban life are found from the best terracotta plaques of Bengal found in Chandraketugarh before the Christian era began.<sup>28</sup> In the Pre-Gupta period, traces of houses made of wood and bamboo, roofs of tiles and mud-walls on the foundation of clay have been found. Using bricks for architecture began later, possibly during the Gupta period. The residential area and the areas related to religious activities were separate from each other. As the outcome of the excavation inside the outer wall, some traces of residential houses have been found. From the Pre-Mauryan period to the Gupta period, the discovery of fences of bamboo twigs covered by mud, roofs of tiles, floors of clay, granary, wells, pottery (Rouletted Ware, Northern Black Polished Wares, etc.) pots of copper, terracotta sculpture, needles made of ivory and bones, beads of semi-precious stones (quartz, agate,

jasper, carnelian, chalcedony, etc) and glass beads are found to provide the proof of urbanization (Haque 1999).

### Curved roof with finial

Three toy-carts all from Chandraketugarh, with holes for axles at the bottom. Each toy shows a couple, the male sitting in front of the female, riding on an animal that looks like a tiger. They always move from the proper left to the right and are depicted against the background of a two-tier pavilion with a curved roof in the thatched style. Of the three segments of the roof, all curved, the central one is at a higher level than the side ones. The pavilion is supported by four upright posts and surmounted by an ogee-shaped finial. Behind the composition is depicted as a semi-circular decorated halo that enhances the very eminence of the architectural setting. The most interesting feature of this plaque remains in the incorporation of the architectural part which has sameness with typical *Bangla Chal* (Fig 27) (Haque 1999). Strangely enough, centuries afterward, when Chinese pilgrims Fa-Hien (early 5<sup>th</sup> century A.D.) and Hiuen Tsang (second quarter of 7<sup>th</sup> century A.D.) visited different parts of Bengal, they recorded religious establishments only like samgharāmas, stūpas, and temples, and never mentioned any secular architecture of the country. The above terracotta materials would establish a repertoire and grammar of architectural motifs of ancient Bengal. In the absence of any structural remains, it will be wrong to infer that these were unreal, or imaginary creations of the terracotta artists. The numerous represented pavilions appeared to be a very popular form of architecture in ancient time. It is possible that these were the buildings referred to in the Vinaya texts of Buddhists, mentioned earlier, and which was commented upon by Buddha Ghosh as the “Suvarna-Vanga-graph” or “Gold-colored-Bengal house”. Bengal was not poor in architecture compared to the contemporary developments in their parts of the sub-continent. It is a pity that extant remains of the comparable age have not been found, obviously indicating the use of perishable building material (Haque 1999).



*Figure 27: Couple under a pavilion with a curved roof representing ‘Bangla Chal’*  
Source: (Haque 1999)

## Mahasthan Garh

“This suggests that by this time the cultural ecology of at least the Varendra region had evolved from shifting cultivation with hoe and dibble stick to higher-yielding peasant agriculture based on the use of the plow, draft animals, and transplanting techniques,” says Eaton. Pundra was an ancient racial name. The Pundra people were believed to have lived in the northern part of Bengal. That is why the region was popularly known as the land of Pundra or Pundrabardhan. It was known from the archaeological research that this city had prospered as a very rich and resourceful habitation from fourth century B.C. to fifteenth century A.D. A limestone tablet inscribed in the Ashokan Brahmi script, discovered at Mahasthangarh in 1931, is dateable to the third century BCE undoubtedly proved that the Maurya Empire ruled in North Bengal. That inscription in Brahmi letters also proved that in north Bengal the center of the Maurya administration was Pundangal i.e. Pundranagor (Husain,2007). According to the ancient testimonies, Mahasthan region was a rich granary with abundant agricultural produces which were redistributed to the neighboring regions. Population growth in the region of Mahasthangarh has had two specific and deleterious effects on archeological remains: the removal of some sites and the covering of others with modern habitation. Sites that consist of an elevated area with structures i.e. mounds, area subject to destruction since by removing the mound, villagers can simultaneously recover valuable building materials from buried structures and create a level ground for agriculture. The location of the sites around the urban core, however, suggests that there were significant shifts in the location of population in the hinterlands of Mahasthangarh over time (Alam,2001).

The Northern Black Polished Ware and mud-structures have been found in the cultural stage of the end of the 4th century BC or the beginning of the 3rd century BC. The use of wood and rouletted wares is also found in the architecture of this time. During the 3rd century BC, the use of mud walls and tiles in the roof has also come into our notice. Previously, with the Northern Black Polished Ware, there emerged the terracotta plaques and animals' figurines, semi-precious stones and glass beads, even terracotta lamps that bore the characteristics of the Mauryan period. At the advent of the 3rd century BC or the 2nd century BC, there came copper pots, cast coins, ornament dais, lockets of birdlike shapes and gold. Though the mud structure was prevalent, the influence of tiles became dominant. Traces of wood are also found. By this time, brick dust came to be used in the place of mud, and lamps of bronze and glass, weapons of stones and copper rods (antimony rod) were added to the list of existing artifacts. Nonetheless, the aforementioned artifacts have been found in the phase of the 2nd century BC and baked bricks and brick dust have been found in the partition walls of mud structures of the next cultural phase (1st century BC). Building city walls began at this time. Full-fledged brick-built city walls were built during the 1st century BC or the 1st century AD. A vital discovery of this time is a hoard of Silver Punch-marked coins. It is a fact that cities were built in Mahasthangarh in the Early Historic period. Yet, many stone sculptures, terracotta plaques, Buddhist temples, and Hindu shrines have been found. It would be relevant to mention that while visiting Pundranagara between 639 and 645 AD, A Chinese pilgrim Hsuan Tsang, who visited and described the place in the 7th century in those terms (Alam,2001).

*‘a numerous population houses located by the river and separated by flowered bocages. The low and the wet soil gives a great abundance of grains including the breadfruit tree. Numerous monasteries, more than one hundred temples, gods from different religions are represented, and thousands of pilgrims from western India come and live there.’ the agricultural wealth is recalled as far back as in the 3rd or 2nd century B.C., on the Brahmi inscription.*

In the excavation in Mahasthangarh, more than one Buddhist temple and Hindu shrine have been uncovered. The location of sites around the urban core, however, suggests that there were significant shifts in the location of population in the hinterlands of Mahasthangarh over time.

PERIOD	LEVEL	BUILDING METHODS	SUGGESTED CHRONOLOGY
EARLY HISTORIC PERIOD	1	The structure was made of mud wall	Late 4 <sup>th</sup> cent. / Beginning 3 <sup>rd</sup> cent. BC
	2	Mud wall along with timber pillar was introduced in architecture.	Late 4 <sup>th</sup> cent. / Beginning 3 <sup>rd</sup> cent. BC
	3	The floor at associated structures wares made of compact clay.	Late 4 <sup>th</sup> cent. / Beginning 3 <sup>rd</sup> cent. BC
	4	-Foundation was treated by excavators, as a pillar or a bench or a kind of buttress indented to strengthen the wall. -Clay made floor, mud walls along with timber posthole to carry the roof	Late 4 <sup>th</sup> cent. / Beginning 3 <sup>rd</sup> cent. BC
	5	Tiles have been introduced as a roofing material. Also noticed backed bricks used as binding materials in the construction of the mud walls.	3 <sup>rd</sup> cent. BC
	6	-Tiles have been introduced as a roofing material. Also noticed backed bricks used as binding materials in the construction of the mud walls -The roof of mud architecture was covered by tiles	3 <sup>rd</sup> cent. BC/ beginning 2 <sup>nd</sup> cent. BC
	7	Earth-based architecture; timberwork; tile roofing (large size); floor made up of fgts of bricks and clay	3 <sup>rd</sup> cent. BC/ beginning 2 <sup>nd</sup> cent. BC
	7B	Unknown Floor made up of brick fgts.	2 <sup>nd</sup> cent. BC
	8	Earth-based architecture, baked bricks for partition walls; tile roofing (small size); the floor of crushed bricks	2 <sup>nd</sup> cent. BC/1 <sup>st</sup> cent. BC
	9	Baked bricks probably used in the architecture; floors made up of clay and brick fgts.	1 <sup>st</sup> cent. BC
	10	Complete bricks; tile roofing (small size); floors made up of brick fgts.	1 <sup>st</sup> cent. BC/1 <sup>st</sup> half 1 <sup>st</sup> cent. AD
GUPTA PERIOD	11	Fgtary baked bricks; tile roofing (small size); floors made up of brick fgts.	1 <sup>st</sup> /2 <sup>nd</sup> cent. AD
	12	Fgtary baked bricks, few floors made up of brick fgts.	End 2 <sup>nd</sup> century AD-4 <sup>th</sup> cent. AD
PALA, SENA AND EARLY ISLAMIC PERIOD	13	Fgtary baked bricks, few floors made up of brick fgts.	3 <sup>rd</sup> AD-5 <sup>th</sup> cent. AD
	14	Fgtary baked bricks, few floors made up of small brick fgts.	6 <sup>th</sup> cent.AD-10 <sup>h</sup> cent. AD
	15	Fgtary baked bricks, few floors made up of brick fgts.	6 <sup>th</sup> cent.AD-10 <sup>h</sup> cent. AD
	15B	Fgtary baked bricks, few floors made up of brick fgts.	8 <sup>th</sup> cent.AD-12 <sup>h</sup> cent. AD
	16-18B	Fgtary baked bricks	16 <sup>th</sup> cent.AD-18 <sup>h</sup> cent. AD

**Table 4: Early historic architectural remains unearthed by a French team from the cultural level of c. 3rd century BCE – 18<sup>th</sup> century CE/AD at Mahastangarh.**

Source: (1sr interims reports 1993-1999 on Mahasthan, by French-Bangla joint excavation team)

<b>MUD BASE</b>	To hold the wooden post on a solid structure, the builder of that time constructed mud base under post hole. Such mud base was marked in level 3 at French part, where a rectangular shaped tempered mud structure measuring 55 x 0.6 m long and 0.34 m wide, was noticed. The idea of creating such a mud base indicated the builders' knowledge about the right installation of post over any solid and hard base.
<b>BUILDING FLOOR</b>	The building of the early phase of Bangladesh was single storied. If we take note of various measurements of walls and post holes of the early historic architectures of Bangladesh in various cultural levels at France-Bangladesh excavation indicates the buildings of that period was a single story. Formation of the structure, the thickness of the wall and diameter of the post hole, the deepness of the post are criteria to trace the floor stories. In level 3 of the French part, the excavators noticed the depth of the post was hardly 0.30 m to 0.40 m, suggesting a single storied building.
<b>BUTTRESS WALL</b>	To strengthen the construction, the builders used the buttress wall in architecture and such sign has been traced in level 4 in the French part. So, buttress wall was introduced in Bengal in early historic time which is still being practiced in architecture.
<b>TILES TECHNIQUE</b>	<p>For the purpose roofing of, tiles were used in early architectures. These were rectangular in shape, have longitudinal grooves and pierced with two holes for anchoring to the roof frame. Tiles are noticed in various early historic levels in French-Bangladesh excavations (Fig 37), and a trial excavation at Govindabhita (Rahman 2000: 226), both at Mahastangarh.</p> <div data-bbox="742 987 1054 1205" style="text-align: center;"> </div> <p style="text-align: center;"><b>Figure 28: Terracotta tile discovered level 7, Mahastangarh</b></p>
<b>WOODEN BEAMS</b>	The excavators noticed that the wooden beams were used in early architectures of Mahastangarh. In level 6 and 7 of the French part, the excavators have unearthed such clue, where numerous longitudinal traces of charcoal were noticed. Actually, these charcoals are remains of wooden beams of the building.
<b>TECHNIQUE TO FILL THE VOIDS INSIDE THE WOODEN FRAME:</b>	The excavator noticed specimens of a red coating with high vegetal temper. These red coatings specimens are used in timber frame to fill the voids inside the wooden frame.
<b>FOUNDATION TECHNIQUE</b>	The foundations of the early architectures were laid over a solid bed. This solid bed was made up of small brick fragments sometimes mixed up with big sherds. Above the foundation, the bricks are set lengthwise and are tied up with micaceous yellow sand. To strengthen the foundation of the wall, brick bats and brick dust with adhesive hard soil were used at the foundation bed.
<b>BRICK LAYOUT TECHNIQUE</b>	Various brick layout techniques were used in early architectures. The layout of the bricks differs along with the successive courses. These are stretched on the edge, header and diamond tilting. In early levels, the excavators noticed, brick set on edgewise in the inner core of the structure, though they were not visible to the eye. Generally, this sort of layout is seen on the outer core of the building. Such edgewise set of brick in the inner core is noticed in level 12 of the French part. Here edgewise setting in the inner core may be a technical device in the structure.
<b>FOUNDATION TECHNIQUE</b>	The foundations of the early architectures were laid over a solid bed. This solid bed was made up of small brick fragments sometimes mixed up with big sherds. Above the foundation, the bricks are set lengthwise and are tied up with micaceous yellow sand.



	To strengthen the foundation of the wall, brick bats and brick dust with adhesive hard soil were used at the foundation bed.
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**Table 5: Architectural elements marked through excavation**

Source: (Haque ,1999)



**Figure 29: the image of a Mud house with Tile roof**

**The people of Bengal made good use of the sticky component of red earth when it is wet, which helps easy binding for walls. The sticky stuff becomes very stiff once it dries up.**

Source: (Hossain,2007)

Secular settlements had been attested only in Mahasthangarh. Cultural levels till the virgin soil had been touched at both sites. Each may be regarded as presenting the core of a settlement complex as the citadel is surrounded by an area having rich habitation remains. Both are most significant on account of their size, assemblage of objects, great longevity and rich cultural possession. For the history of the evolution of settlement of any kind a thorough study of both will be required. We have seen above that the earliest evidence revealing human activities in Mahasthangarh dates back at least to the 4th century BC (From Table 4 and Table 5).

From level 2 in Mahasthangarh evidence of wood along with earth as base material started to be revealed. Mud houses are not the indicator of poverty for rural Bengal. Even in recent past well to do villagers used to live in houses made of the earthen wall and thatched roofs. Mud is the commonest element in rural Bengal for making a wall or as binding and plastering substance. A floor of clay is also a common feature of housing. Brick was needed at the time of temple construction and that also not always. Poor villagers could not afford brick construction. Hence, we see the use of bricks coincided with the commencement of urbanization in both the sites. Levels 2-4 in Mahasthangarh show uniformity in construction technology in the well-built floor of clay, mud walls tempered with wood and few cases burnt brickbats and potsherds as well as in material remains significantly in NBPW (Fig.29). The true nature of buildings constructed by these mixed materials is not ascertained. In the absence of tiles, it may be assumed that thatch had been used for roofing. Burnt brickbats perhaps indicate that these were used with mud mortar for religious or other public buildings (Haque 1999).

### 3.4 The Aryans: Anthropological assimilation



*Map 8: Aryan Migration In India*

Source: (Banglapedia ,National Encyclopedia of Bangladesh)

The Aryans, like the earlier Indus valley settler, began living in small villages, on land reclaimed from the forests on the banks of the rivers. The fertility of the land of the valley of the Ganges catalyzed the transformation of the pastoral habits and the economic and social organization of the Aryans: the restless nomad has gradually weaned away from his wanderings and lured into the stable and established life of an agriculturist (Map 8). Next to the Indus Civilization, during the Vedic culture, when the building activities again come into view, we do not find any well laid out cities, rather we come up with an elementary type of village huts, more suitable to forest dwelling. It may be said to be a fresh beginning of an architectural tradition, where the people were satisfied with the elementary structures of reeds and bamboo thatched with leaves. From a variety of sources, it is possible to visualize the kind of building that the early settlers found suitable for their purpose. There is the significant character of the subsequent architecture which reproduces in many of its aspects the type of structure from which it originated.

#### 3.4.1 Vernacular house of Aryan... “the Making of Vedic HUT”

Though the early Aryans had seen the use of brick in the cities of the Harappans, their descendants chose to build their village settlements in timber, bamboo, and thatch which were readily and abundantly available from the forests (Fig 30). The chariot builder of the fighting Aryan tribes was familiar with their use and was able to adapt his skills of carpentry easily to the building of wooden structures. Timber and bamboo dwellings were also simpler and easier to maintain or rebuild in case of damage by rains and floods. The new settler was still a nomad at heart and permanent structures were against the natural grain of his existence. Moreover, to the victorious Aryans, brick structures were symbolic of a people they had conquered and whose cities and towns they held in contempt. As depicted in later carvings on stone and described in their great literary epics, the early Aryan village was a conglomerate of timber and thatch huts of different types. The most elementary of the huts was circular in plan, this being the simplest to construct with bamboo and thatch. The wall was made of upright bamboos tied together with twisted twigs. The roof made with bent

bamboo took a domical or conical shape, made watertight with overlapping thatch or grass. Though easy to erect, the interior of a circular but had obvious functional limitations. An addition was then made in the form of a rectangular but in front. In roofing this too the builders took advantage of the elastic nature of bamboo. Lengths of bamboos were bent into a semicircular shape and tied with a string at the base, much like the cord of a bow. A series of these put together over the two longer parallel bamboo walls of the hut created a barrel-like roof, which again was covered with thatch and grass. The huts were arranged in groups of threes and fours around an open courtyard. A conglomerate of such units was the typical Aryan village (Grover,1996).

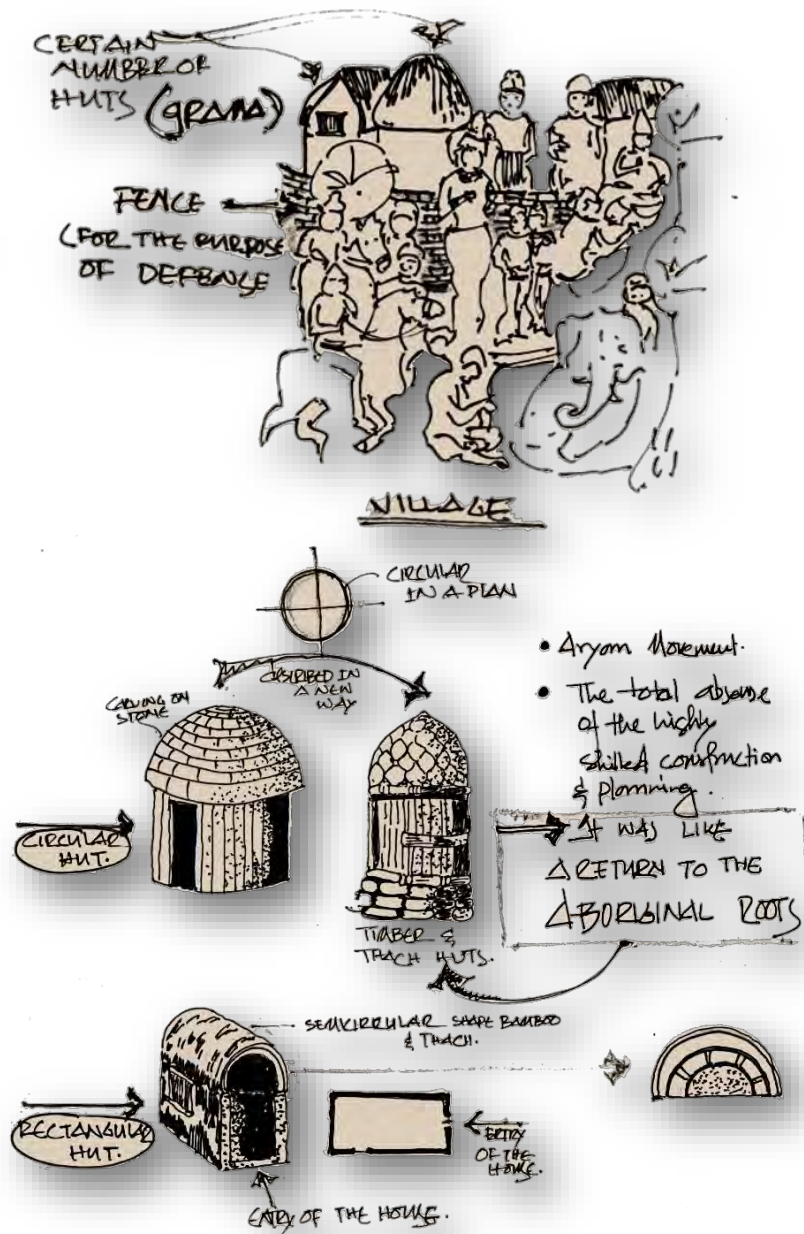
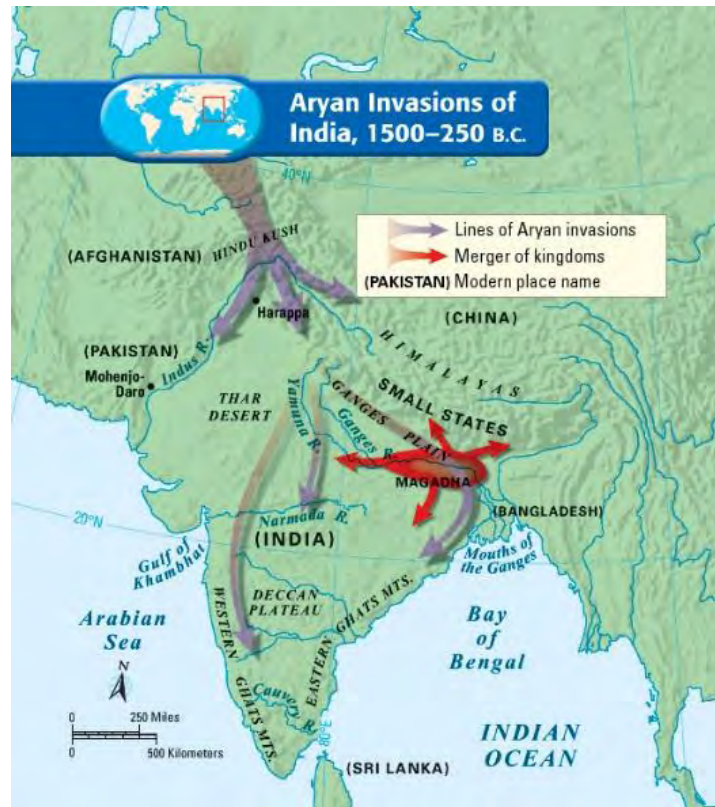


Figure 30: Vernacular House Of Aryan (Vedic Hut)  
Source: (Grover, S: Buddhist and Hindu Architecture in India.)

### 3.5 Aryanism in Bengal

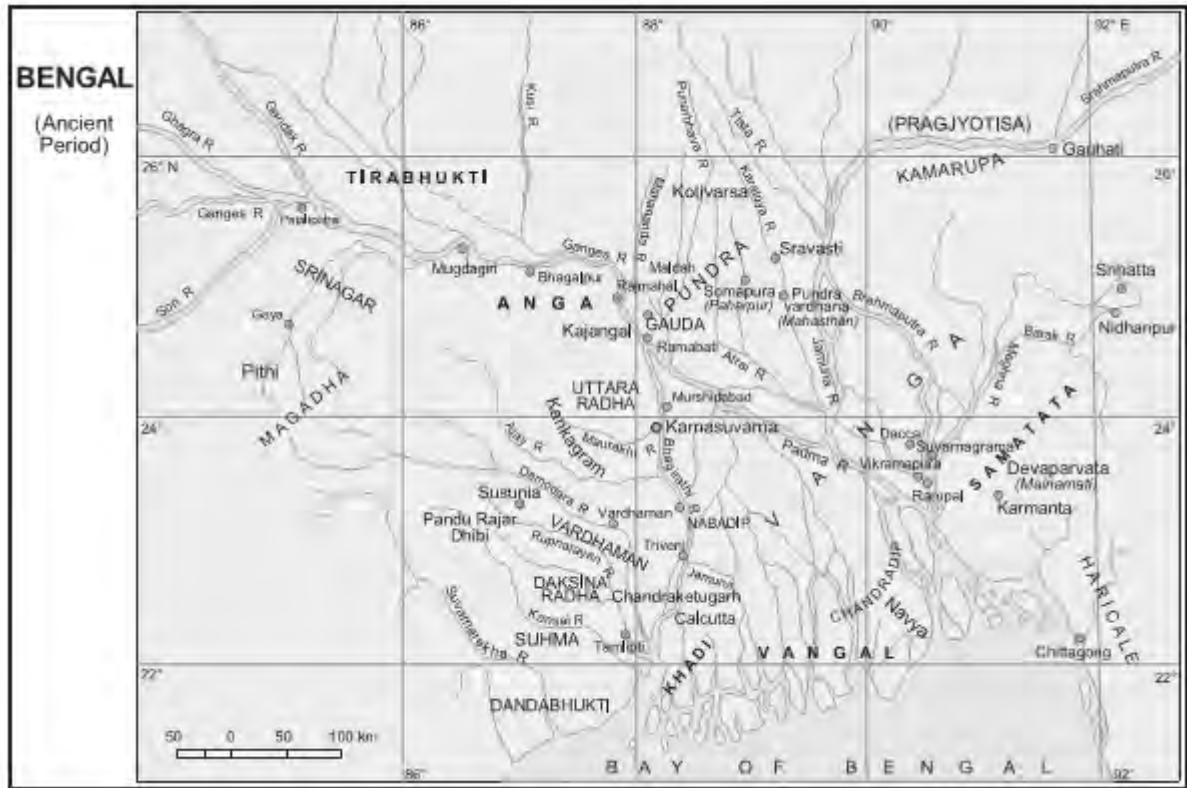


**Map 9: Showing Line Of Aryan Invasions Of India, 1500 BC**  
 Source: Banglapedia (National Encyclopedia of Bangladesh)

There is no reference to any part of Bengal in the *Rg Veda* (Paul, 1940). The tribes of Eastern India including Bengal are mentioned for the first time in the later Aryan literature. The *Satapatha Brahmana* refers to the tribes of Eastern India under the collective name of the *Prachyas* (the Easterners). The *Prachya Janapadas*, as mentioned by the Sanskrit grammarian Panini in the fifth century BCE, comprised Panchala, Videha, Anga, and Vanga. From the Mahabharata, we also know of the existence of some other important tribes of Bengal: the Prasuhas, who lived in Prasuha, perhaps a division of Suhma; the Tamraliptakas, who lived in Tamralipti (modern Tamluk); and the Karvatas, who lived in Karvata. It is thus evident that each janapada was named after the name of its tribe. Anga, Suhma, Prasuha, Tamralipti, and Karvata were in West Bengal. It is beyond dispute that Pundra was in northern Bangladesh. The Pundras occupied the territory where the ancient city of Pundranagara (modern Mahasthan Garh in Bogra district) would emerge later (Chakrabarti, 1992). It is not possible to define the boundaries of Vanga with any degree of accuracy. Broadly speaking, Vanga was the territory lying between the Bhagirathi on the west and the Meghna on the east.

The Aryans entered Bengal as fighters in campaigns, traders in communities and preachers of religions. As a result a new force was introduced in Bengal (Map 10). The Aryan language, religion, social practices and other elements of culture were established. The non-aryan language disappeared and the Vedic and puranic religions, Buddhism and Jainism spread in Bengal. The advent of the Aryans in Bengal constitutes a historical watershed. Over many centuries in the historic era the

Aryan languages, civilization, and culture gradually took on in Bengal, absorbing the earlier civilization and culture and, undoubtedly, expressing it in a new form. The great achievement of the Aryan people was the aryanization of the Austric and Dravidian people. It is said that from about 5<sup>th</sup> century B.C, the Aryans pushed into Bengal from the west and it took about one thousand years to get settled (Grover 1996).



**Map 10: Ancient period of Bengal**

Source: (Banglapedia, National Encyclopedia of Bangladesh)

From 800 BC or a little later the Aryans started to come into Bengal as adventurers, preachers, and conquerors. This was the first migration of outsiders into Bengal that has historical documentation. The two preachers of new religious ideas challenging the dominance of the Brahmanas and Brahmanical rituals namely Gautama Buddha and Mahavira Vardhamana came to Bengal to preach their religions, Buddhism and Jainism respectively, sometime in 567BC. They preached doctrines of nonviolence, and soul and samsara. According to Buddhist legend Buddha spent six months in Pundranagara identical with the ruins of Mahasthangarh in the Bogra district of Bangladesh (Husain,2007). The extension of the Gupta empire confirms this process of the establishment of Aryanism in Bengal. Thus, Bengal turned Aryan in social life and culture, although the people retained some of their old customs, habits, and beliefs. After the Aryans, there was no significant arrival of any other people in Bengal until the advent of the Muslim. They made their homes in temporary small thatched huts of straw, bamboo or vines, or in tents of animal hides; in groups, they wandered from place to place. Having come into India they gave up nomadism and started to make permanent settlements after coming into contacts with the austric and Dravidian language speaking peoples, who enjoyed, respectively, an agricultural, village-based civilization and an urban culture; the Aryan gradually adopted both these cultures giving rise, in turn, to the evolution of a new civilization called Aryan civilization.

### 3.5.1 Historic---Gupta Influence (Beginning of the 4th Century CE-Middle of the 6<sup>th</sup> Century CE)



**Map 11: Gupta empire (320-600) AD**

Source: (Banglapedia, National Encyclopedia of Bangladesh)

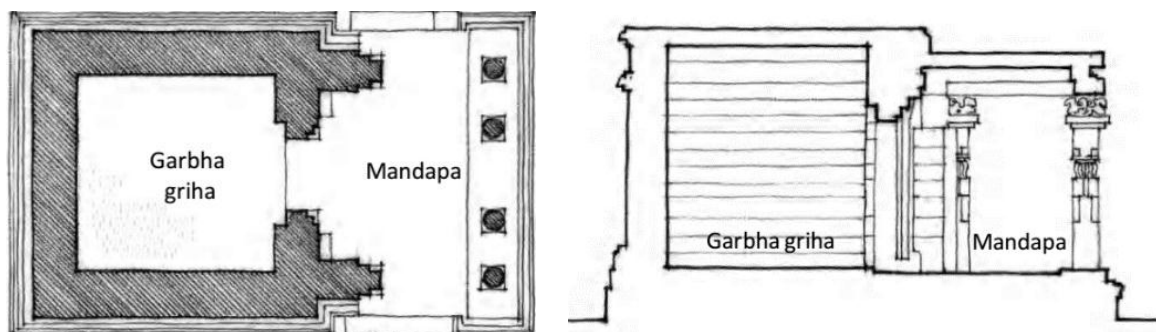
There is explicit evidence behind the assumption that Bengal was a part of the Gupta empire from the 4th century AD until the middle of the 6th century AD (Map 11). Evidence reveal that the Gupta and the Pre-Gupta images and terracotta plaques have been discovered in more than half a dozen archaeological sites along with the discovery of the Gupta copper inscriptions in four sites. Inscriptional evidence authenticate that a vast region of North Bengal went under the Gupta rule. Extensive archaeological investigations into these areas would be helpful to reveal the details of the Gupta period. During the Gupta period (c. 4th century AD to 6th century AD) the *Brahmanas* started to come from North India to Bengal in groups to settle here and their dominance was established in the society by the patronage of ruling dynasties and wealthy people. The evidence of contemporary inscriptions shows that in this period many Brahmanas obtained land to settle permanently and Brahmanical temples were built. From the information derived from epigraphs, it is also known that these Brahmanas who belonged to different Vedic branches were well known for their proficiency in Vedic sacrifices and other rituals. They held titles like *Sarma*, *Catta*, *Bhatta*, and *Vandya*. The migrations of the Brahmanas continued in the Pala period and under active royal patronage. The Buddhist ruler Sricandra's Paschimbag copper-plate, a record of the endowment of

a vast area of land in the Sylhet region for the settlement of six thousand Brahmanas in Sricandrapur Brahmapur *Visaya*, is important evidence of this (Rahman 2007).

Using bricks for architecture began during the Gupta period. The Guptas were the first architects of purpose-built Hindu (but sometimes also Buddhist) temples which evolved from the earlier tradition of rock-cut shrines. The residential area and the areas related to religious activities were separate from each other. Adorned with towers and elaborate carvings, these temples were often dedicated to all the Hindu gods. Unfortunately, relatively few of a large number of Gupta temples built have survived. As the outcome of the excavation inside the outer wall, some traces of residential houses have been found.

### 3.5.1.1 Gupta architecture:

In Gupta architecture, the square was considered the most perfect form and temples were designed to be appreciated from all sides so that each carries decorative architectural features. The anthropomorphic conception of a deity naturally called for some habitation, and so a structural shrine came into being. The various stages through which the embryo Hindu temple passed are common to the growth of such edifices, first a leafy bower, then reed hut and afterward a cella of wood and brick. Eventually, on the Gupta period, it appears as a sanctum of stone, called the Garbhagriha, literally “womb house”, a small chamber, square in plan. The temple at Sanchi is a remarkable example of this type. (Fig.31) As one can see the basic idea was only a traditional concept of the ‘house’ or ‘pavilion structure’ of the traditional rural area in Bengal.



*Figure 31: Temple at Sanchi showing a flat-roofed garbhagriha and mandapa, linked by a simple stepped stylobate and architrave*

Source: (www.Google.com)

The personal patronage and scholarly encouragement of the rulers created an atmosphere favorable to a revival of all forms of human activity, spiritual and material. The great stimulation was accorded to Hinduism, the innate faith of the people so that they were mainly of one mind. Among the effects of this fortuitous synchronization of circumstances was that produced on the arts of the age, and notably on that of architecture. In the art of the building, two progressive movements of fundamental significance are discernible, one relating to its aesthetic character and the other to the structural procedure. Previously all shrines connected with the Brahmanical faith appear to have been a very impermanent order. An ancient commentary, the Satapatha Brahmana, incidentally describing one of these before the Christian era, states that it comprised two sheds, “formed of posts and beams covered with reeds and mats, “thus seeming to imply that a very primitive shelter was all that custom ordained in the ceremonial usage of this belief (Brown,1956).

### Garbha Griha

In the early stages of development during the Gupta period, Hindu temples appeared as a sanctum of stone called garbha-griha, a flat-roofed square chamber, having no opening except the doorway. In front of this was a shallow porch (Fig.32 a.) which was enlarged to form a pillared portico in later Gupta structures. In the next phase of development, the small hall was transformed into a large square hall, roofed with sloping stone slabs, as in the example of the Ladh Khan Temple. In the middle of the rear wall of the main hall, a square portion was partitioned to create the Garbha Griha. The mandapa is a double row, pillared hall with a portico in front (Fig.32b.) Gupta temples reached their culmination in the Deogarh Temple dating 500 CE. In this example, the rudimentary and ineffective convention of a flat roof was eliminated and the upper portion of sanctum was carried upward in the form of a pyramidal tower. The base of the shrine was elevated by being placed in the center of a square terrace. The most notable feature is the arrangement of the portico. Instead of one, there are four porticos projecting from each side of the central structure with a flat roof supported by four columns (Fig.32c.).

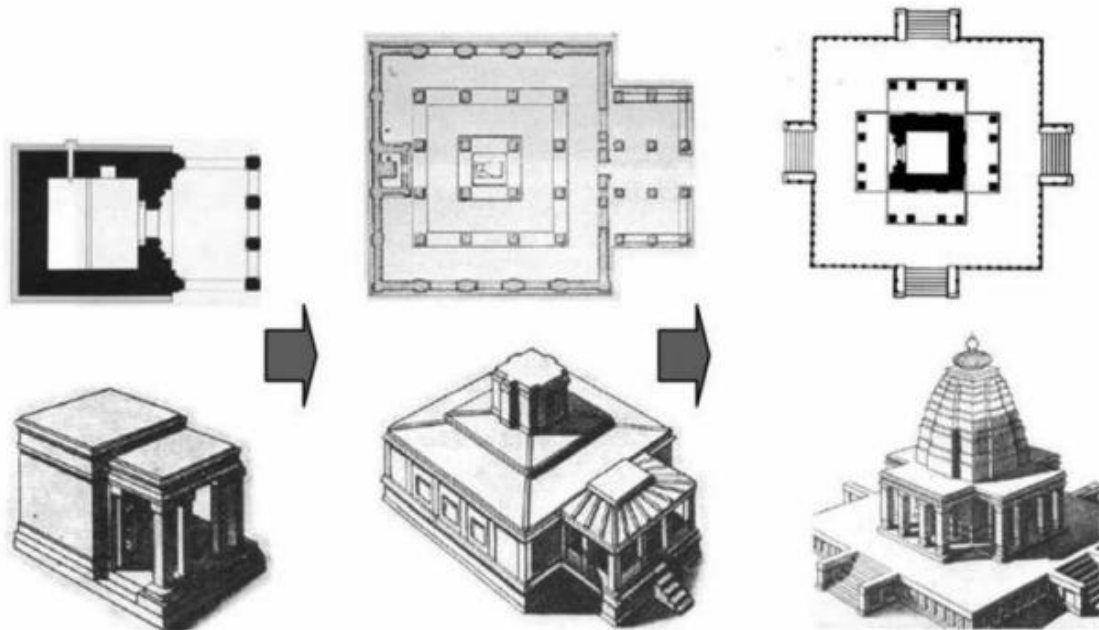


Figure 32: a. Gupta temple, 415 CE (left) b. Ladh Khan Temple 450 CE (middle) c. Deogarh temple 500 CE(Right)  
Source: (Percy Brown,1956)



Gupta buildings date from the 4th to the 6th centuries, the earlier examples besides being in accordance with the generical formula of a flat roof and pillared portico, possessed other distinctive features. These early Hindu sanctuaries are comparatively small structures, in size much inferior to the monumental religious edifices which rose later, so it seems more appropriate to classify them, not as temples, but as shrines or chapels. They are obviously only the beginning, but they are important, because they were the nucleus of the temple proper, being in themselves. These Gupta shrines are something more than a symbol, they reflect that ‘sudden glory’ which comes with afresh inspiration, the capital or “order” providing the keynote (Husain,2007).

### 3.5.2 Pala Influence (c. 750-1160 CE)

The rulers of the Pala period were Buddhists and believers of Buddhist ideas and Buddhist philosophy was materialized with the establishment of numerous stupas, temples, and monasteries. The first shrine was erected over the relics, death of the Buddha when his cremated remains were divided by his followers and placed in ten locations associated with his life and teachings. To mark these places, a simple mound of rubble and earth are known as a ‘stupa’ was erected over the relics, in a manner comparable to traditional village memorials or Chaityas, where the ashes of deceased leaders were placed in a mound often located on the outskirts of their settlements. It was this traditional form and placement that served as a genesis of later Buddhist architecture.

624-560 BCE	Birth of Buddha
589-525 BCE	Enlightenment of the Buddha in Bodhgaya. Buddha introduced the world to the Four Noble Truths and commencing his career of teaching the religion he called “Dhamma vinaya”.
544-480 BCE	Passing away of Gautama Buddha.
268-232 BCE	Reign of King Asoka in India, who converted to Buddhism and became an important patron of the religion. Asoka established Buddha’s dharma on national level, and Buddhist rock-cut architecture, began Hinayana Buddhism and established Hinayana Buddhist viharas and monasteries.
200- BCE	Beginning of Mahayana Buddhism.
100- BCE	Establishment of Great Stupa at Sachi, India.
100- BCE	Buddhism established in Cambodia and Vietnam (150 C.E). Buddhism enters central Asia and China.
3 <sup>rd</sup> cent. CE	Establishment of Great Amaravati Stupa, Andhra Pradesh, India. Expansion of Buddhism to Burma, Cambodia, Laos, Vietnam and Indonesia.
350-550 CE	Gupta empire, during which Buddhism flourished through the subcontinent.
5 <sup>th</sup> cent. CE	Buddhist monastic university founded at Nalanda, India. Establishment of Buddhist famous religious structure-Mahabodhi temple at Budh-Gaya, India. Mahayana Buddhism was introduced into Java, Sumatra and Borneo by Indian Immigrants.
7 <sup>th</sup> cent. CE	Establishment of famous stupa, shrine and monastery at Sarnath, Benares, India. Buddhism flourished in Bengal. Buddhist scholars of Bengal contributed to the development of the Nalanda monastery which was situated in Magadha.
8 <sup>th</sup> cent. CE	Establishment of Pala dynasty in Bengal, under which Buddhist religious structures reached their peak. Beginning of “Sharvatavatra type”, establishment of Paharpur at Rajshahi, Bengal and Vikramashila Vihara at Bihar, India. Establishment of Shalban Vihara, Mainamati in Bengal. Borobudur temple complex built in Java.
11 <sup>th</sup> cent. CE	Establishment of Ananda Temple at Pagan, Myanmar.
12 <sup>th</sup> - 13 <sup>th</sup> cent. CE	The Moslems attacked and conquered Magadha and other parts in Bengal and with the destruction of the Buddhist monasteries and universities Buddhism was wiped out. Establishment of Angkor Wat, Cambodia.

*Table 6: Timeline of Buddhist history and major developments on the subcontinent from 624 BCE to the 12th century*

In time, Buddhist monks settled in the vicinity of stupas to form small monasteries of individual cells organized around open courts. Their rituals included walking around the stupa, which necessitates the establishment of a processional path, remains central to the Buddhist temple design. (Moffett, et al. 2003).

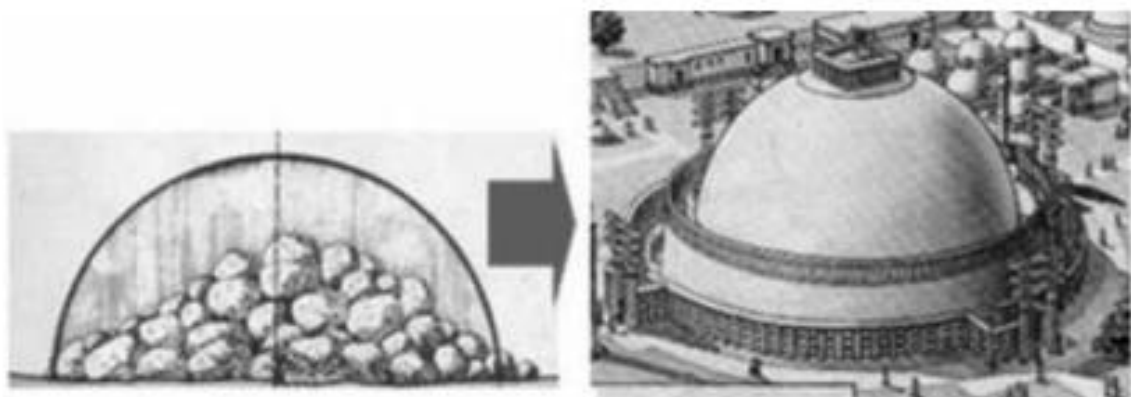
### 3.5.2.1 Pala architecture:

The Buddhist dynasty lasted for four centuries (750-1120 CE) and ushered in a period of stability and prosperity in Bengal. After the establishment of the Pala's empire in this part of the subcontinent, Buddhism flourished in Bengal and Bihar under their patronage (Ahmed, 1966, p. 72). The Palas were followers of the Mahayana and the Tantric schools of Buddhism (en.wikipedia.org/wiki/Pala\_Empire). Pala's created many temples and works of art as well as supported the Universities of Nalanda and Vikramashila. Paharpur (Somapura) Mahavihara built by Dharmapala is the largest Buddhist Vihara in the Indian Subcontinent. The Pala Empire can be considered as the golden era of Bengal.

The earlier evidence of historical monumental architecture in Bengal comes primarily from the Buddhist tradition and includes stupas, temples, and monasteries. Travel accounts from around that period mention that the landscape was studded with stupas and temples, the remains of some of which now extend from Paharpur in the north of Mainamati in the south-east. This early monumental architecture marks a moment of conscious creation, pointing to the transition from an unselfconscious architecture – the domain of traditional, vernacular practice – to a more metaphoric and symbolic construction. This was the result of a more consolidated political and social structure, that is, the long and fairly stable reign of the Palas (750-1160 AD) and their architectural and artistic maturity, and to the strong cultural links between Bengal, Bihar and Northern India (Husain,2007).

#### Stupa:

The stupa is the rudiment of the architectural form of Buddhism. The first appearance of a stupa was hemispherical in form. The plan, elevation, section and total form of stupa were derived from the circle (Fig. 33). In the center of This domical mound, there is a space left for the receptacle containing the relic of Buddha and a circumambulatory path built into the superstructure. Pilgrims and worshippers used this path to walk around the mound.



*Figure 33: (left) First form of Stupa and (right) stupa at Sanchi 1<sup>st</sup> century BCE*  
Source: (Percy Brown,1956)

In the later phase of development, the stupa was enlarged to double its size. The top of the hemispherical mound was flattened to make a place for a circular platform from the middle of which

rose a three-tiered stone umbrella. This was set inside an enclosure of a low stone fence or *chhatrayasti*. The upper circumambulatory path was introduced and a *torana* (gateway) was added at the cardinal points. The Stupa at Sanchi is a remarkable example of this type. Despite the fact that no stupas with dome-like superstructure can be found, and if iconographic representations can be taken as proofs, the 7<sup>th</sup>-century bronze votive stupa found at Ashrafpur in Dhaka can be considered as a fairly accurate resemblance. It has all the features of a typical (north Indian) stupa, but with peculiarly elongated dome emerging from a lotus on a cruciform base (Fig. 34). The *Harmiak-chhatravali* atop the Ashrafpur stupa is also unique. Not only does it clearly represent a *Chau-Chala* roof unlike most northern and western examples, but also, as S.K. Saraswati points out, it has unique adornment of the Buddha figure on four sides of *harmika* (Bharadwaj,1976). No doubt it is a glorified hut- the “last hut” on an earthly plane before the final “dissolution” towards enlightenment.



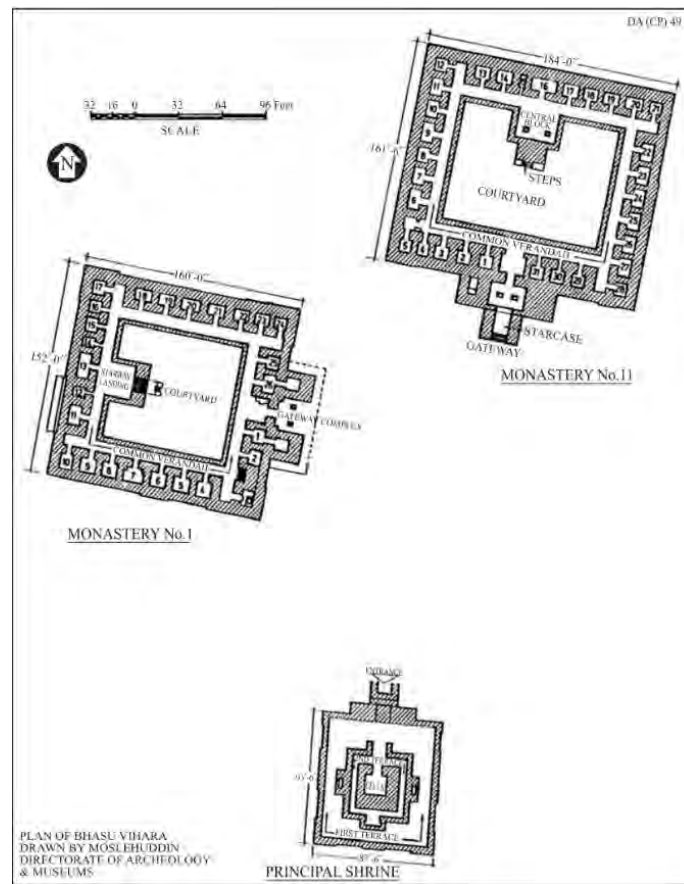
**Figure 34: the Ashrafpur Bronze chaita, 7th century AD.**  
Source: (Ashraf, 1997).

The bronze chaita depicts a hut with a double-tiered roof, possibly a *Chau-Chala* (four segmented), supported on spindle-shaped columns without any enclosing walls. The parasol has also affected designs for *rathas*, boat-shelters, and canopies for beds and thrones. There is evidence top of double storied pavilioned buildings with canopies in early Buddhist manuscripts, or of stylized Sultani houses with bent roofs in the 16<sup>th</sup> century *Iskandernama* (Hassan,1989).

### **The monastery or *vihara***

The monastery or *vihara* is another important example of the Buddhist tradition. The *vihara* essentially is a collection of cells for the monks placed around the courtyard. If stupa was the most important of early architectural forms, it was the monastery which was the most significant in early Bengal architecture. The Chinese accounts and the inscriptional eulogies of which we have made mention at the beginning, in fact, all relate to monasteries and the temples within them. Monasteries in India were at first of wood on a substructure of stone or brick. But as the monastic organization developed, they became huge brick structures with adjuncts of smaller buildings for various purposes. Monasteries in Bengal and Bihar were generally designed in the old traditional Kushana pattern-square in plan with rows of small rooms on all the four sides of a vast courtyard in the

middle. As one can see the basic idea was only an enlargement of the traditional concept of the ‘house around a courtyard’ harking back to the traditional rural house form Ashraf, (1997). (Fig. 35)



*Figure 35: Basu Vihara ground floor plan, (c 7<sup>th</sup> or 10<sup>th</sup>-11<sup>th</sup> century)*  
 Source: (Husain,2007)

The many viharas in the Mainamati-Lalmai area and impressive Somapura vihara (Paharpur), indicate both an insularity and a special sociality of the vihara institution. The 8<sup>th</sup>-century Paharpur complex was the largest in the Pala domain, and presumably the largest in the sub-continent<sup>13</sup>. It is a unique combination of the vihara and temple, consisting of a vast courtyard, nearly a thousand feet wide, with votive stupas, minor chapels, water tank and other structures, and is enclosed by a quadrangular ring of one hundred and seventy-five cells, with the impressive cruciform temple-structure at the center of the court which even in its ruinous state stands seventy feet above the ground. In a word, a monastery was completed with all kinds of structures providing the necessary amenities for monastic life. Rightly perhaps it has been compared with a modern residential university. Remembering the conditions of those days it is indeed remarkable to see how from a humble dwelling house for the monks, the monastery eventually came to be developed into a great architectural feat. The monastery, in general, is said to have exercised a great influence on the development of madrasa architecture which although is commonly known to have begun in the 11<sup>th</sup> century in Iran is probably of much earlier origin Ashraf, (1997).

**Buddhist painting illustration**

Certain 11<sup>th</sup>-century manuscripts and paintings illustrations give indirect evidence of the form and shape of religious structures. Such huts, with certain variations in roofs and supports, continue well into later centuries. A number of motifs encountered in the Baroda and Rajshahi manuscripts (Haque 1999).

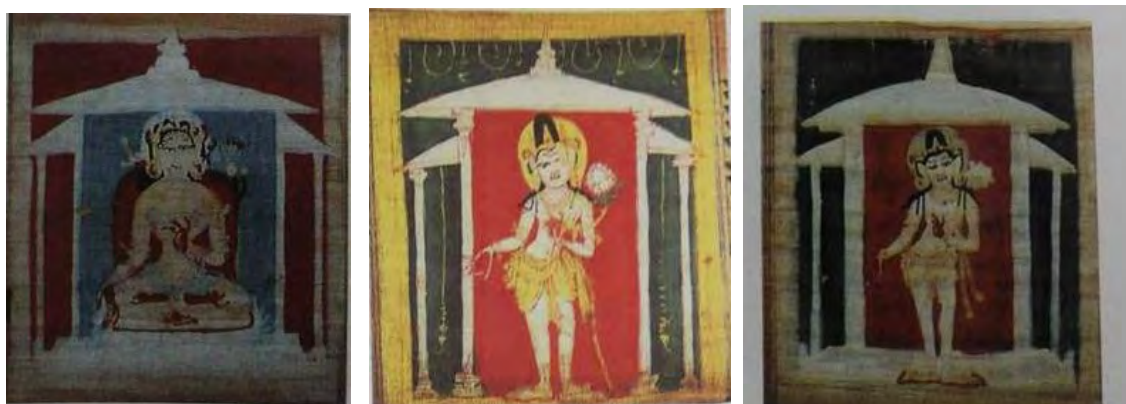
**a. Trefoiled niche with three tiers and an *amalaka***



**b. the monument which has a square opening and its surmounted by a shikhara**



**c. Flat triangular roof standing on two thin pillars, on either side**



Pala art provides the imagery of a recurring shrine/temple: square or rectangular cella with a ‘pyramidal’ roof formed by horizontal courses with a *shikhara-amalaka* finale. The roof is supported by pillars with vase-bases, often with trefoil arched opening on each side of the cella. The podium is made up of horizontal courses with staggered corners or sometimes configured as a lotus form (Fig.36). Pala art provides the imagery of a recurring shrine/temple: square or rectangular cella with a ‘pyramidal’ roof formed by horizontal courses with a *shikhara-amalaka* finale. The roof is supported by pillars with vase-bases, often with trefoil arched opening on each side of the

cella. The podium is made up of horizontal courses with staggered corners or sometimes configured as a lotus form. Broadly, what was happening architecturally was a meditation of the North Indian ideals and types with the tradition and practice of this region. Sometimes, when conditions were conducive, as in Paharpur, meditation turned to a memorable moment. The *vihara* and stupa-temple types were combined within the Bengali context to produce a unified complex.



Figure 36: Image of a shrine (drawn after an 11<sup>th</sup>-century manuscript illustration)  
Source: (Ashraf, 1997)

### 3.5.3 Sena Influence (c.1098-1204 CE)

Towards the end of the Pala, rule began the Brahmanical control of the society in Bengal. This control was firmly established and consolidated during the Sena period. The Sena kings came to the throne after the Pala reign collapsed in the second half of the 11th century. As the Brahmin rituals and traditions flourished during the Sena reign, the construction of temples covered more extensive period. Remains of temple architecture are very scanty. Despite the similarities in the configuration of Buddhist and Brahmanical temples, and despite the decline of Buddhist culture since the 10<sup>th</sup> century and the gradual rise of Hinduism, specific remains of the Brahmanical structures have not survived the ravages of both man and nature. Motifs and representations in the sculptural art of the Pala's and Senas and certain 11<sup>th</sup> century manuscript illustrations give indirect evidence of the form and shape of religious structures. The extant temples in Pagan in Burma built in the 10<sup>th</sup> and 11<sup>th</sup> centuries are another important clue to the building tradition of Bengal<sup>15</sup>. According to roof shapes two distinct temple types have been identified: the *Shikhara* (tower) type and the *Bhadra* (tiered) and combinations of the two. Here, a certain tension between the North Indian category, the shikhara type, and the delta-empathic *bhadara* type may be noticed, pointing to a difference between the verticality of the sky-soaring *nagana* and horizontality of the low-massed structure (Husain,2007).

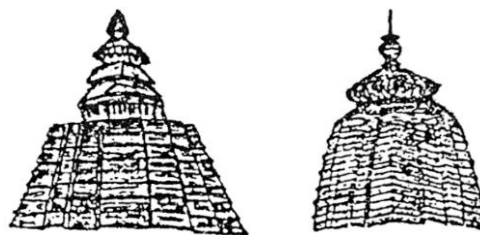
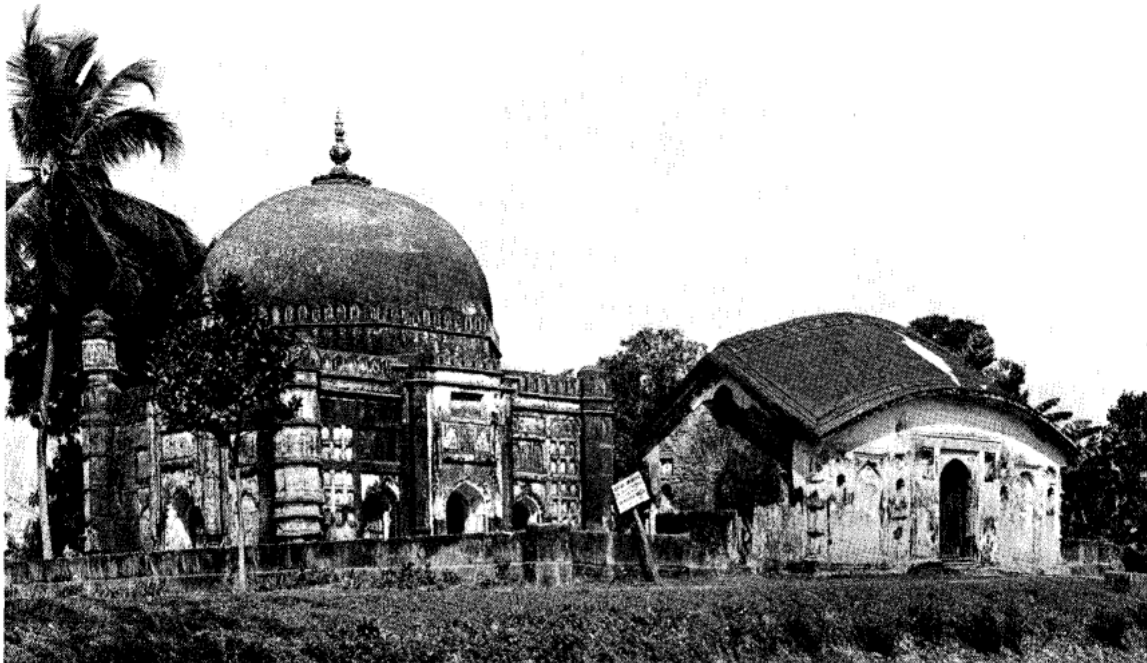


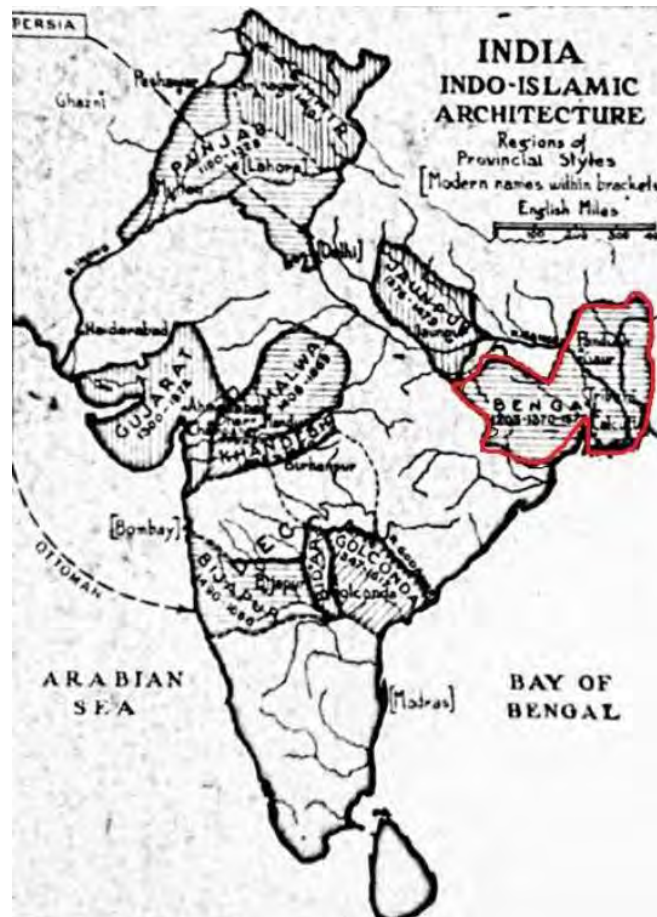
Figure 37: Sketch of a Bhadra or Pida Deul (left), Sketch of a Shikhara or Rekha Deul (Right)  
Source: (Husain,2007).

### 3.6 Central Asian Influence (1204 AD-1757AD)



*Figure 38: Shah Muhammad Mosque (1680) Mymensingh. Following the square single domed mosque type popular in Bengal, Muhammad Shah's Mosque is notable for its entrance portal, situated at the eastern end of the courtyard.*  
Source: (Ahmed,1984)

The life of Bengal and therefore its artistic heritage is largely determined by the two great river systems, the Brahmaputra and the Ganges. After girdling the icy peaks of the Himalayas, they eventually combine in the plains of Bengal and, through innumerable channels, leave behind an alluvial treasure that makes this delta one of the most fertile regions of the world. The proverbial agricultural plenty made it a very attractive center of international maritime trade. Therefore, it was no wonder that from the very beginning of history Bengal gave its name to the bay that serviced such transactions. This unique deltaic situation, along with the frequently shifting rivers, exceptionally heavy rainfall, prolonged floods, and growth of the dense forest, considerably shaped the destiny of the people. It is only natural to anticipate that these geographic factors, quite unusual to the torch-bearers of Islam, continued to influence profoundly the growth and development of the art and architecture of Bengal in the same way during the Islamic period as they did before. It was a major event in the history of Bengal's political and social life when the Turks arrived in the 13<sup>th</sup> Century. It was the beginning of the new religious ethos- "Islam" in this delta with the introduction of Mosque in the arena of building and architecture. The Muslims had come to Bengal with their developed civilization of Islam as their heritage, and they meant to settle down in the country in order to establish a new home for themselves. The carrier of this civilization, who were Turks, had themselves been uprooted from their homeland in central Asia, (Map.12) and they came here as squatters to make a bid for a new career in their life (Dani,1961).



*Map 12: Central Asian (1204-1757)AD*  
 Source: Banglapedia (National Encyclopedia of Bangladesh)

During the medieval period, there was a revolution in Bengal art, architecture and literature. The sultans primarily tried to follow the basic principle of Islamic architecture; however, they eventually established an architectural pattern with the mixture of Indo-Arabic flavor in the rainy Bengal. The new morphology of *singular free-standing volume* with an idea of *Pavilion* and the wall with perforation, as a response to the climate, were the primary features. Roof as a canopy resembled a village hut. The expressive quality of brick, often exposed and the prolific use of *terracotta* accentuated the concept of “localism” in the practice of architecture. Islam had more than half a millennium of maturity and an enormous wealth of varied experience. The advent of desert-born Islam in deltaic Bengal was of the

utmost significance to the local people. Architectures were built mainly with brick and clay. In the later period, the Mughals brought the total innovation and renaissance in art and architecture. They started a massive architectural pattern with the admixture of Persian and central Asian flavor in previously practiced Indo-Arabic Islamic architecture in Bengal. It is also evident that medieval rulers also built and patronized temples and shrines all across the Delta (Eaton, 1996: 228-266). Hundreds of mosques and terracotta mosques (Hasan, 1981), temples and shrines (see: Ghosh, 2005), monuments (detail in: Hasan, 1987b; Alamgir, 2011), bridges and culverts (Alamgir, 2015), cities (e.g. Hasan, 1987a; Khatun, 2006; Roy Choudhury, 2012) and mint towns (Eaton, 1996: 317)



all across the Bengal still glorify the medieval golden age. Medieval Bengal is also praised for its contribution in Bangla language and literature, as because modern Bangla language took its form during this time. Many of the rulers had a famous poet, foreign travelers, and historians in their courts. Many ancient Sanskrit texts and important were also translated into Bangla, Arabic, and Persian language. (A. B. Siddiq & a. Habib). Expression of one's culture is the foremost of all the objectives of art. As shall be seen later in this chapter, the mosques and temples which developed in this period were actually successful in representing the identity of the common people, the bulk of whom was in the rural areas. This alone may be enough for these to be given a high value in architecture. In the current quest for meaning, these monuments are therefore important as evidence because they speak of the meaningful elements of the collective consciousness.

### **3.6.1 Sultanate Influence (1204-1526)**

The conquering Muslims of the thirteenth century already possessed a highly developed architecture of their own. By then, certain elements, such as the arch, dome, minaret, mihrab, etc., had been recognized as fundamental features of Islamic architecture. Owing to a lack of easy availability of stone within its own boundaries, Bengal continued to be dominated by brickwork in its building art, and molded terracotta's made out of the fine-textured alluvial clay were employed for the purpose of surface decoration. In fact, terracotta decoration reached a new dimension that attained an aesthetic individuality of its own, claiming equal glory with that of the mosaics of Damascus or the tiles of Isfahan. But the use of stone was not totally neglected: the Muslim architects of Bengal recognized its strength and whenever possible used stone pillars for supporting arches and domes. Stone was also used occasionally as the outer facing of walls, the inner core of which was made of bricks, to overcome the hazard of atmospheric humidity.

#### **3.6.1.1 Traditional uniqueness and the HUT in Sultani Mosques**

Vernacular architecture in Bengal had far-reaching effects on the development of the indigenous formal architecture. As mentioned before, the most apparent phenomenon is the style that developed after Bengal gained independence under the Muslim Sultans who severed their ties with the central authority and made Bengal their home.



*Figure 39: A common Do-Chala rural hut in rural Bengal*  
Source: (Ahmed,1984)

Just as the Mughals in later day Delhi sought new architectural styles, so did these Sultans attempt an indigenous Bengal character. Their desire for independence matched those of their subjects and this synthesis materially reached into the vernacular to bring forth a new architectural expression. The buildings erected at this time combined traditional Islamic techniques (arches, vaults, and domes) and types (mosques, tombs, forts) with local materials (brick and terra-cotta) and forms (the hut) (Fig. 39). Thus, domed brick structures incorporating curved cornices was derived from the village hut. Bangla vaults reproduced the roofing system and plans included chambers with open porches in imitation of village huts with verandahs.

### The Bengali mosques

The sultanate period was marked by a tension between submission to the Delhi regime and independent rule of various houses, particularly the Ilyas Shahi and Husain Shahi dynasties. Independent sultanates were gradually rooted in the delta, exhibited in their mixed court culture and social manners. Architecture also reflected the dual situation of importation of new idioms and connectedness to place. The introduction of new building types-mosque. Mazar and madrasa-and of renewed building techniques-the arch and the dome-generally characterizes Sultani architecture. The most architectural phenomenon of this period is the introduction is the mosque as a new building type, but what is more significant is the development of a “Bengali” mosque type.



*Figure 40: A rural mosque, part of which is seen in the left of the picture, resembles the katchari of the house to which the road leads to.*

Source:(Haque, 1992)

The Bengali *Bari* (House) is a cluster of huts arranged around a courtyard. Each hut is given a definite function i.e. bedroom, storage, kitchen, etc. Extending this concept further, it is only natural to erect a special hut for the purposes of worship. Since Islam does not require specific structural types for the purposes of prayer, such small 'prayer huts' could easily be a part of the *bari* of the faithful. (Fig. 40) Bengal, because of its climate, topography, and vegetation, restricts or hampers overland travel. Thus, small and numerous mosques scattered all over for reasons of proximity makes more sense than large congregational mosques.

The Bengali mosques elaborate instead the pavilion idea-the singular, free-standing column, the walls with real or suggested perforations, and the roof as a canopy similar to the village hut. The expressive quality of brick, often exposed and the profile use of terra cotta further strengthened “localism” a distinct mosque type began to appear by the fifteenth century: an isolated pavilion,

which rather than looking inward into an enclosed courtyard, was opened on the outside. The courtyard of the hot dry climate was generally rejected, although courtyards were created by putting boundary walls which were never enclosed or too high but were actually open visually to the surrounding landscape. These walls of the mosque were opened out on all sides: on the *qibla* side, niches on the wall mirrored the openings on the opposite walls. The adoption of the *Chala* form completed the Bengali character of the mosque. These thoughts contribute to the idea of the mosque in Bengal being small and based on the traditional hut. It is not unlikely that the Sultans, in their attempt at monumentality, developed the indigenous mosque and hence created a 'style' for Bengal. Thus, the public mosque may be viewed as a development of the prayer hut of the *bari*. In this manner, public mosques are representations of the original huts. It should be understood that what developed since, in the evolution of communal mosques, represents a derivative of part, and not the entire, homestead of Bengali tradition.

### **The *Chala* hut:**

In a Bengali village, a homestead is composed of a group of huts usually clustered around a courtyard. Each hut is a single roomed rectangular or square structure with walls of woven bamboo, reed matting, or mud on a framework of bamboo or woven posts. The roof is most often made of thatch over a bamboo frame and comes basically in two forms. The (*roof in two segments*: slopes away from the central curved ridge formed by the meeting of the two slopes. A *Chau-Chala* (roof in four segments) slopes down in four directions. Occasionally there may be an *at-Chala* (roof in eight segments) when a *is* duplicated vertically in a receding scale. This happens when the living chamber of a hut is surrounded by the veranda. The roof of the veranda is placed at a lower level than the roof of the chamber and from the front gives the impression of one *Chau-Chala* superimposed upon another, or a roof in two tiers, the tiered roof of the *Bhadra* temple seems clear to be derived from this. Although no domestic buildings survive from the Sultanate period, it is safe to assume that their basic design has not changed very much through the centuries.

A glimpse of sultanate houses can be found in the *Iskandar Nama of Nusrat Shah of Bengal*. In a miniature painting of "Alexander Receiving Dara's Daughter Roshanak" (Fig: 41), the setting is a house, and what must have been a most luxurious one. The king is seated in a square chamber of the house, which has a triangular roofed pavilion (*chala*) on the upper level. The unusual curved eave supported by brackets on the left must be the roof over the veranda which in the traditional house leads to the entrance. Although the curvature of an actual thatched roof is retained, the element is probably made of wood. Reproducing familiar forms in a new material was common; Muslims also reproduced many features of the hut in brick. The brick mosque faithfully followed the unpretentious model, reproducing many forms that are inherent to bamboo-and-thatch construction. The addition of a dome and the change to the square floor plan needed for dome construction were the main formal deviations. The importation of new technologies by the Muslims made it expedient to use the dome, and the symbolic value, clearly distinguishing the mosques from the temples of other religions, must have been an added incentive for its use (Hasan, 1984).



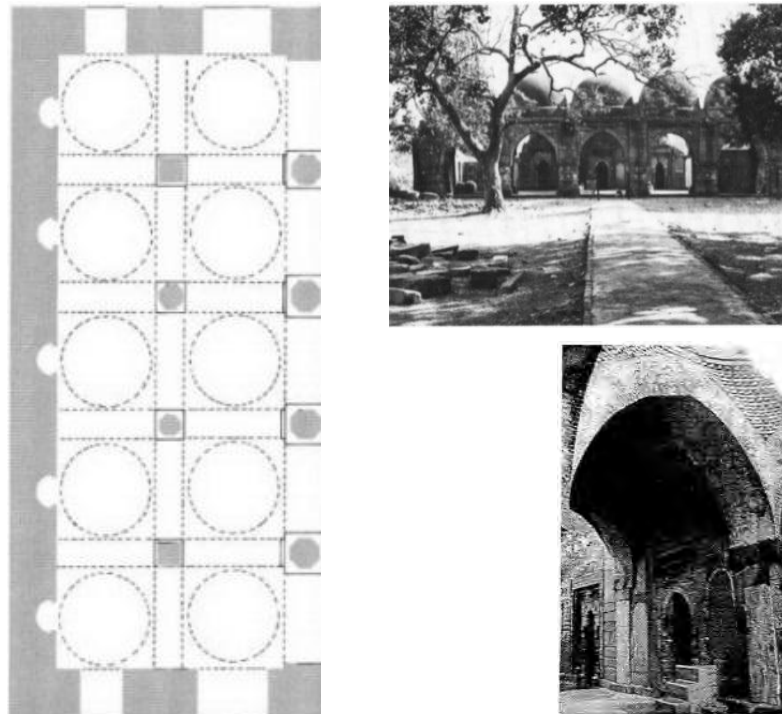
**Figure 41: Alexander Receiving Dara's daughter Roshanak. British Library ms.13836, fol.32. Reproduced by permission of the British Library**  
 Source: (Hasan,1984)

The Bengal mosque retained its original unpretentiousness in its subsequent developments. It was a single-roomed structure, had a curved cornice and *Chala* roof. It could not, in the process, overcome the tremendous power of Islamic symbolization. So, domes, as an Islamic motif, appeared. However, in keeping with the local flavor of submission to nature, these domes were never overpowering. Instead, they were restrained and subdued, in accordance with the general tone of the architecture. The requirements of accommodating a dome slightly modified the plans, however, and so they became either square or derivatives of squares. These geometrical forms in the plan were expressed on the roof in the form of one or more domes. Whenever opportunities presented themselves, as in the case of an elongated bay or the rectangular verandah, the Bengal roof made its appearance. It must be mentioned here, that the Bengali Chala-roof does not need pendentives, squinches or such intermediate elements. Since its base is square, it can rest directly on the supports. Thus, its direct construction added to its appeal. Two other variations of this type are a small chamber with a verandah in front and an extended square building with single or multiple domes.

It has been discussed earlier that the Islamic rule had been introduced in this continent through the 'Nodia' invasion of Ikhtiyar Uddin Muhammad bin Bakhtiyar Khilji at around 1204 A.D. for the next hundred years the governors of Delhi Sultanate and some 'Gazi's' were in the control of power. These rulers first introduced the mosque architecture in Bengal region having the spatial concept and façade articulation of Persian and Byzantine architecture. Before the introduction of Islam, the Bengal region was ruled to be the Buddhist and Hindu kings. They built lots of temples and other structures. The Muslim rulers found long practiced building construction technique by the local masons and they were also introduced by the use of brick and terracotta work. Though most of the buildings were demolished which were constructed in the governor's regime due to the using of

nondurable materials, one mosque can be noted especially for its partial existence till today. That is Zafar Khan Gazi mosque, (Fig 42) which was built by bricks but later had a stone cladding over it for the durability and aesthetic properties (Hasan, 1989). This mosque shows the existence of interior column, multi-dome roof, use of arches for structural load distribution and the use of ‘squinch’ to distribute the load of domes. The technique was imported from Persian and Byzantine construction technique. The introduction of arch and dome was evolved from structural solution rather than Islamic symbolism and early mosques in the Bengal region had direct influence of the mosque architecture practiced in Delhi that time (Husain, 2007).

In the regime of Sikandar Shah (Son of Ilias Shah) the largest mosque was built named ‘Adina Mosque’ in 1373 (Figure 43). It was in the urban area of his administrative center at Pandua (Husain, 2007). The enormous size of the mosque represents the political power and dignity of the ruler and could accommodate a huge number of peoples during prayer (Husain, 2007). Adina mosque is the only mosque in Bengal, which had direct influence of Arab mosques in a spatial organization (Figure 4). Even it had great similarity in plan with Qwat-ul-Islam mosque at Delhi, which was founded by Qutub Uddin Aibek almost a hundred years earlier. Both of the mosques had a central courtyard surrounded by a pillared hall. This complex module of spatial arrangement was commonly seen in the Arabian and Persian region.



***Figure 42: The Mosque of Zafar Khan Ghazi, a thirteenth-century military agent for the Sultans of Delhi, is traditionally dated to 1298 on the basis of an Arabic inscription over the central mihrab.***  
 Source: (Dani, 1961)



*Figure 43: (Left) Pandua, Adina Mosque. South prayer hall looking west towards the central iwan. [Photo: Catherine B. Asher.] and the conceptual visualization of Adina mosque interior (right).  
Source: (Dani, 1961)*

When the Muslim builders started to build small mosques, they had taken the inspiration from the form of rural homestead or ‘Hut’. Apart from the temples, it was the only built form type from which they could be inspired to respect the climatic context and achieve the acceptance from the local mass. The first outcome of respecting the local context, building material and inspired by the origin can be seen in the tomb of Jalaluddin Muhammad Shah, which was a single dome structure with thick walls and known as ‘Eklakhi Tomb’ at 1425 A.D (Figure 44a) (Hasan, 2007). The innovation in the Eklakhi style was the representation of rural hut having curved cornice for rainwater drainage and symbolized the pitched roof (Husain, 2007). The corner minarets with circular bands represented the bamboo support in rural huts. The dome in this structure was revolutionary because of its size. It also generated the concept of the independent model of the mosque for a small community (Hasan, 1989). In later phases, lots of mosques were built having a single dome over the main prayer area. The curved cornice and minarets with bands at each corner became the symbol of ‘Bengal Style’ which lasted for the next 200 years. The Eklakhi tomb of Jalaluddin Muhammad Shah was entirely built on bricks (Hasan, 1989).

Ilias Shahi family came in power for the second time through Nasiruddin Mahmud Shah. He and his successors ruled this continent peacefully and had great contribution in mosque architecture. The Bengal style in mosque architecture got prominence and became profound in their regime. They had introduced a mixed structural system in independent models and built a number of small mosques for the local community.

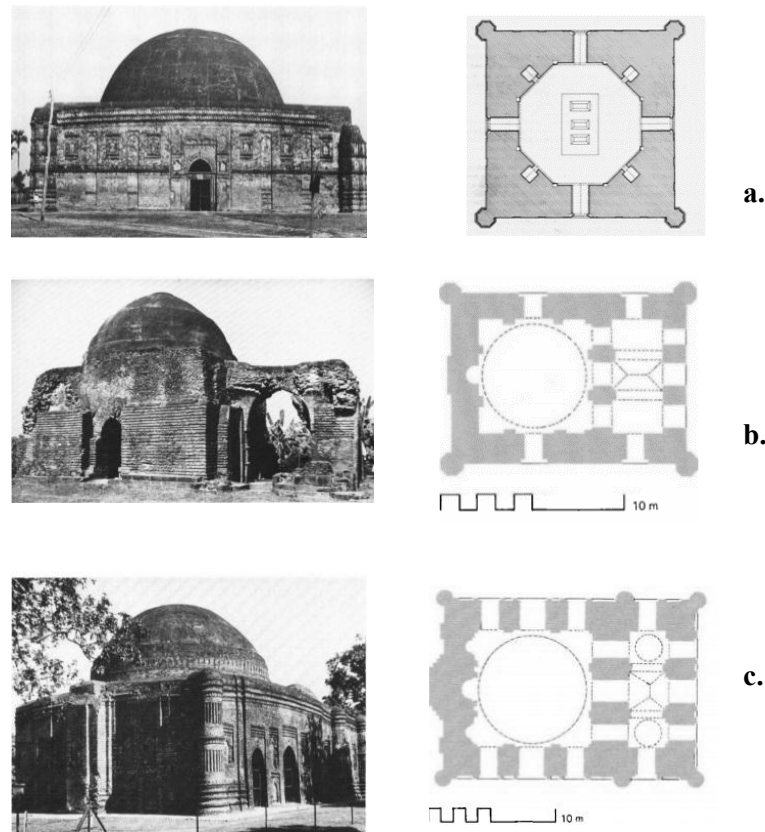
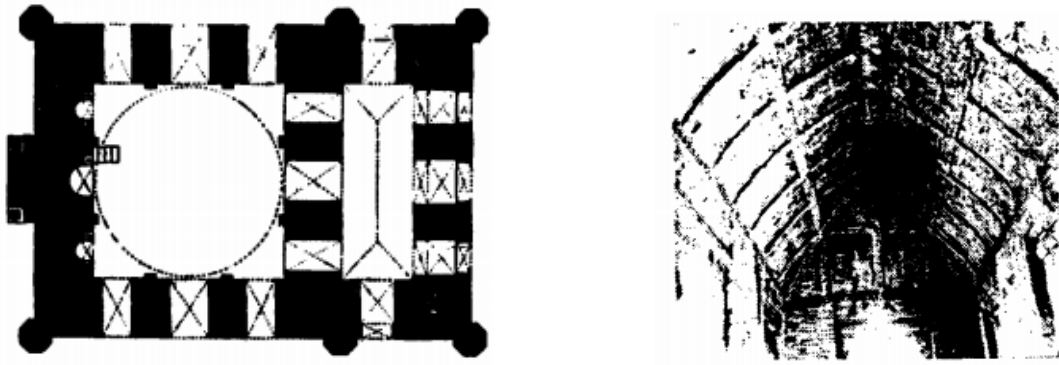


Figure 44: a. Eklakhi Tomb (1425), b. Chamkatti Mosque (1475), c. Lottann Mosque (late 15<sup>th</sup> early 16<sup>th</sup>)  
Source: (Dani,1961)

The notable Example of this phase is the Chamkatti Mosque (Figure 44b) at Gaur, Maldah. It was founded by the Yousuf Shah at 1475 A.D. An additional approach verandah with the main prayer area is the unique feature of this mosque. A similar feature can also be seen in the ‘Lottan Mosque’ (Figure 44c) but Chamkatti Mosque was much older than it. The verandah was topped by the ‘Chowchala Vault’ at the central grid and one small vault at both sides (Husain, 2007). The vault was made having a similarity with the “Chow-Chala roof” of the rural hut (Hasan, 2007). By using the Vault over the central nave of the verandah represents both local heritage and structural symbolism. The vault over the central nave became so popular that many of the large mosques had this feature in later decades. Another feature that made Chamkatti mosque special was the using of stone at the base and beneath the arches to reduce decay and increase the structural strength. Using the mixed material is also a part of innovation in this unique mosque which added additional features in ‘Bengal style’.

Masjid Bari Mosque (1465 AD) is in south Bangladesh. It is the second earliest dated mosque of the covered rectangular variety. It is a very small mosque only 21.5 feet square. 4 Built entirely with brick, it has a verandah on its eastern side. The prayer hall is covered by a dome. The verandah has a *Chau-Chala* or four sloped roofs which, from the inside, has the ribs prominently marked out in the brickwork in imitation of the bamboo framework of the original huts. (Fig. 53) It may be entered by the three entrances on the east and each of the northern and southern sides. Of the three in the east, the central one is the widest.



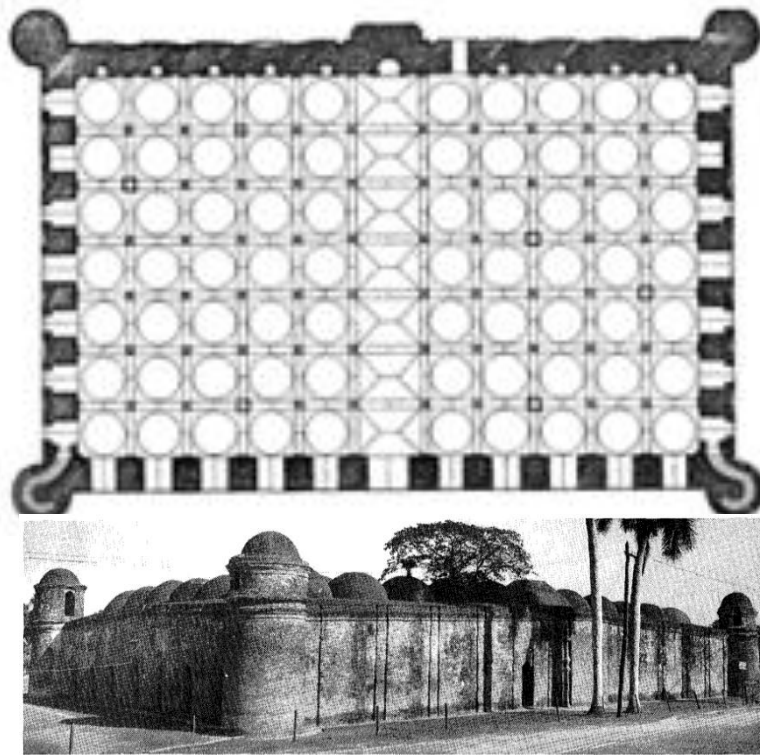
*Figure 45: Masjid bari mosque plan and interior view*

Source:(Hasan, 1999).

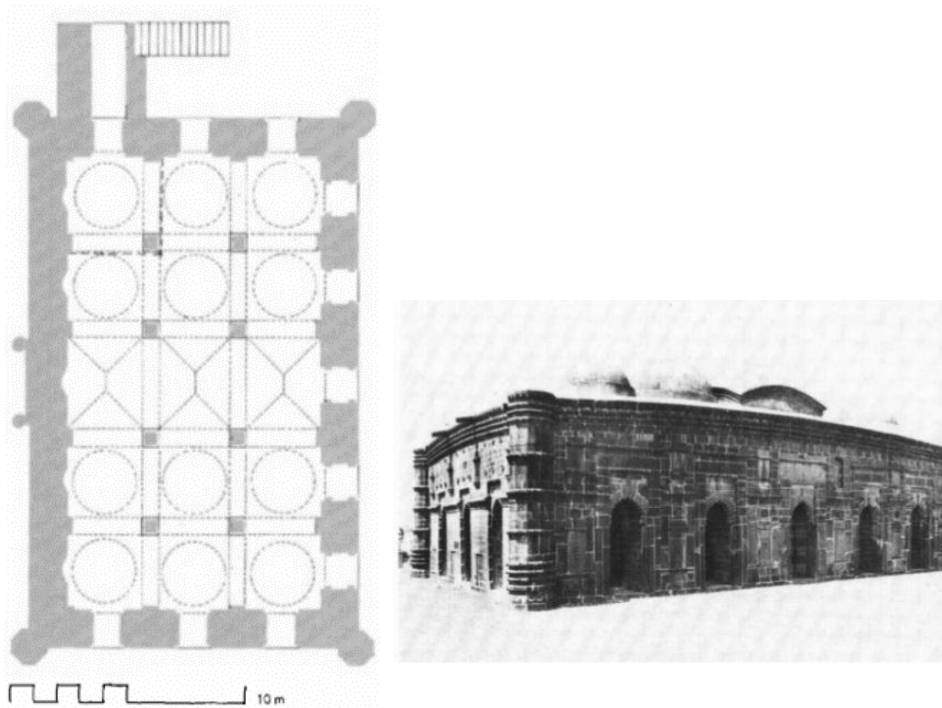
After conquering, Khan Jahan formed a city and named it “Khalifatabad” (Zakaria, 2007). He ruled there for more than forty years and during that period he developed a unique architectural style in mosque architecture which is known as “Khan Jahan Style”. He had developed an independent prototype composed of pendentive and dome. Repeating this single prototype in rows can generate the horizontal expansion of prayer space. This invention virtually opened the opportunity to build a large mosque under a single roof; though the roof was composed of multiple domes. Having this prototype. Three large mosques in this group-the Shaitgumbad in Bagerhat (mid-fifteenth century), the Darashbari in Rajshahi (1479), and the Choto Shona in Rajshahi (1493-1519)-are mosques with emphasized central aisles.10 they are reminiscent of the central nave of the Adina mosque, but the method of vaulting differs. Instead of a long, barrel-vaulted nave, the central aisle is broken up into smaller rectangular units, each one covered by a Chau-Chala vault (fig 45). this Chau-chalas are miniature forms of the roof found on village huts in Bengal. These roofs are composed of four segments which slope down in four directions. Over a rectangular room the longer slopes from a ridge at the top, and the end slopes are triangular in shape. The lower edge s of the slope is generally curved.

The hut was the basis f the development of the Bengali mosque type. Perween Hasan has argued strongly for the triangular relationship of the hut, the temple and the mosque in understanding Sultani architecture. While the hut, or the free-standing pavilion, might have been the conceptual idea for the production of Sultani mosques, it also appeared more literally, particularly through various adaptations of the chala form.at the Shait Gumbad mosque in Bagerhat (Fig 46), the Darash bari mosque (Fig 48), and the Choto Sona mosque (Fig 47), both in Rajshahi, the central aisle of each mosque was covered by Chau-Chala vaults, while the rest of the mosque was spanned by domes. If the dome is the icon par excellence of Turko-Persian architecture, or the for that matter, the symbol of Muslim architecture, then its replacement by Chala shapes, particularly over the main aisle of a mosque, is truly an extraordinary intervention. A later but significant example of the glorification of the hut is the tomb-shrine of two Shaikhs in Sonargaon (16th century), where the whole structure is conceived as two char-Chala huts. The tomb in Fath Khan in Gaur (17th century) (Fig 49), is also built as a “lithified” hut, with a curving do Chala (double-segmented) roof. A more abstracted development. And something which distinguished Sultani architecture and Bengali temples in general, is the curved cornice derived from the bent roof of the hut.it is also possible that the texture of the woven bamboo wall also adapted to produce the combination of the geometrical grid and the patterns in relief terra cotta, as may be seen in Atiya Mosque in Tangail (1609) (Fig 50),, and later in plaster, in the Katra mosque in Murshidabad.

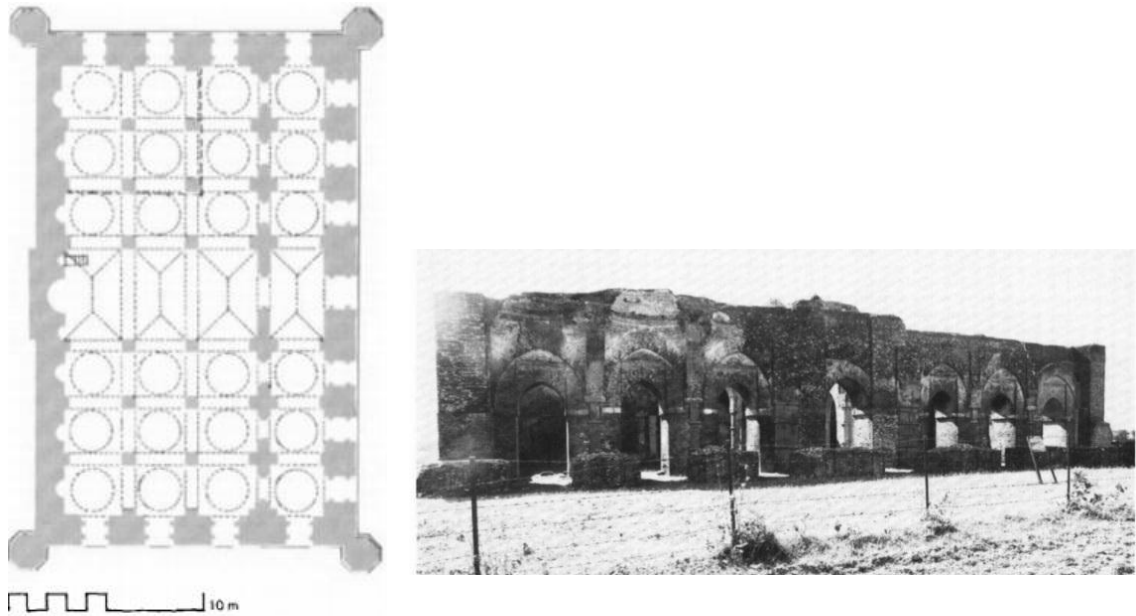




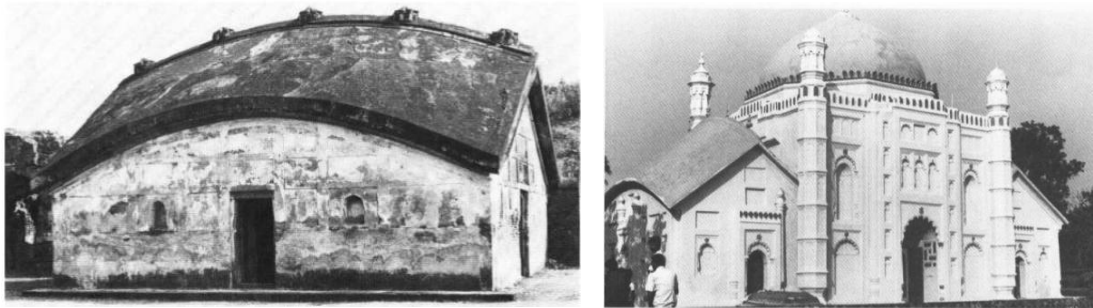
*Figure 46: Shaitgumbad Masque in Bagerhat (mid-fifteenth century)*  
Source: (Dani,1961)



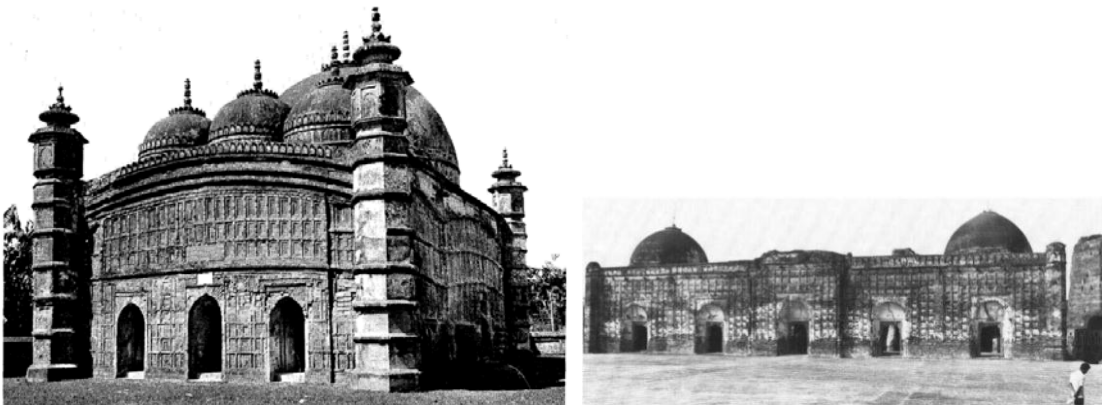
*Figure 47: Choto Shona mosque (1493-1519)*  
Source: (Dani,1961)



**Figure 48: Darashbari Mosque (1479)**  
Source: (Dani,1961)



**Figure 49: The tomb in Fath Khan in Gaur (17th century) and Tomb of Khawaja Anwar-i Shahid**  
Source: (Ahmed,1984)



**Figure 50: Atiya Mosque in Tangail (1609), and later in plaster, in the Katra mosque in Murshidabad.**  
Source: (Ahmed,1984)

### 3.6.2 Mughal and Nawabi Influence (1610-1757 AD)

Mughal Rule was consolidated all over Bengal, making it the Eastern edge of an Empire. The Mughals concentrated more on establishing an efficient imperial administrative system with their advent in 1596 AD. During the long and fairly peaceful Mughal rule, both Muslim and Hindu enjoyed a considerable degree of freedom. (Ckutchion,1983). The formation of Subah-e-Bangla, the province of Bengal, marked a new political reality for the region: a renewed tension between a Delhi-centered empire and the provincial status of the region. The community of a traditional culture that had developed and been promoted during the Sultani period was interrupted to a great degree by the Delhi entered authority of the Mughal empire. Mughal architectural production in Bengal itself was quite perfunctory, especially in the eastern delta. The Mughals concentrated more on establishing an efficient imperial administrative system. They wanted to add a New Architecture Order – New Sense of Sophistication. Rich Surface Decoration with Terracotta Tiles was at times, Replaced by Plastered Panels. They built several mosques all over the region and a number of mausoleums to commemorate the leaders and heroes and also built forts at a strategic location to secure their control. Mosque at Sat Masjid, Mausoleum Bibi Pari's Mazaar, Lal Bagh Fort, Bara Katra, and Chhoto Katra are some of the examples from the Mughal era.

The patronage of the Arts by Akbar and Shah Jahan slowly permeated into the rank and file of the feudal lords. The suspicious attitude of the Bengali rural-folk towards Mughal-Imperial ideas was allayed by broad vision policies of the Emperors. Specifically, from the linguistic and thematic point of view, middle ages were a glorious period of Muslim traditions (Asraf,1960). Muslims had not only created a new form of romantic literature, but they had also thereby freed Bengali literature from the cramp of sectarian influence. The architecture followed the other fields of Arts in the adoption of Mughal vocabulary. The Bengali Architect was not blind to the architectural feats in Agra and Delhi. In fact, Bengali masons had a forum to display their indigenous expertise in Fatehpur Sikri alongside craftsman of other regions. Shah Jahan introduced the curved cornice in the Bangla Mahal in Agra. The "Bengali Style" was now recognized and appreciated by the whole nation. The Mughal power was interested in the provinces primarily for economic reasons, and to some extent for their exoticism. Abul Faz'l in the Ain-i-Akbari, mentions the popularity in Agra of the architecture of two provinces, Gujrat and Bengal. An example of it is the privilege given to the Bangla roof, seen in Delhi in the marble canopy on the emperor's throne and on the roof of the Shah Burj kiosk (Fig. 51 & 52), and in Agra and Lahore of the roof of the emperor's audience pavilion (the naulakha) (Fig 54), and in the emperor's private mosque, the Moti Masjid (Fig 55) (Ashraf,1997).



*Figure 51: Marble canopy on the emperor's throne, Delhi.*  
Source : ( www.google.com .bd)



*Figure 52: Shah Burj kiosk, Delhi*  
Source: (www.google.com.bd)



**Figure 53: emperor's audience pavilion, Agra**  
Source: (www.google.com.bd)



**Figure 54: emperor's audience pavilion, Lahore, (the naulakha)**  
Source: (www.google.com.bd)



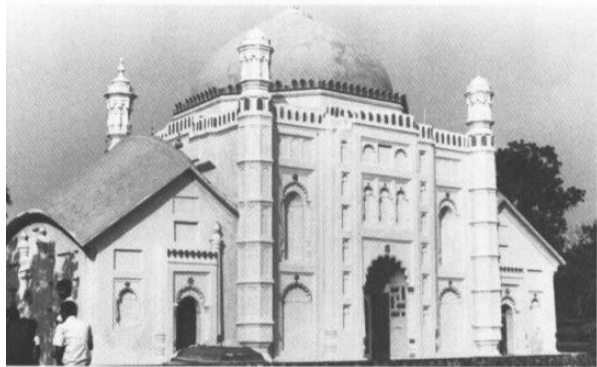
**Figure 55: The Moti Masjid**  
Source: (www.google.com.bd)



There was also a formal and stylistic distinction between Mughal and Sultani buildings. The Mughal mosque was established after a transitional period which saw Bengali traditions mixed with increasing adoption of North Indian Mughal features. For most of the seventeenth century, Mughal rule in Bengal reflected the secular outlook of the emperor Akbar. This secular outlook was continued by the seventeenth century Mughal Viceroy, who built relatively fewer mosques than did the Sultans preceding them (Eaton,1985). The capital of Bengal was shifted from Raajmahal (Akbarnagar) to Dacca (Jahangirnagar) in 1608-09 AD and back to Raajmahal in 1639 AD as Jahangir was also not a keen patron of Mosque Architecture. Nevertheless, under Shah Jahan, an architectural efflorescence came to Bengal. Shah Shuja, son of Shah Jahan, served as governor of Bengal from 1639-1659 A.D (Catherine,1985). Like his father, he appears to have been an enthusiastic patron of architecture. A number of mosques were built during this period both in Raajmahal as well as in Dacca (Sur,1975). In 1660, the capital was shifted back to Dacca.

The principles of large-scale ordering of Mughal architecture was exhibited although dimly in Shah Shuja's palace in raajmahal (1740s), the Khawaja-i-Shaheed complex (Fig. 56) in Burdwan (late 17th century), considered by Catherine Asher as the most picturesque Mughal complex in Bengal, and the incomplete Lalbagh Fort in Dhaka(1680s). formal gardens and pools, gateways and enclosures, and various buildings like mosques, tombs, and madrasahs sometimes a pavilion in the eater, as in the Khawaja Anwer -i-Shaheed complex. Were organized in the characteristic's Mughal axial relationship. The complex in Burdwan also contained a uniquely formed tomb, a single-domed central structure, flanked on two sides by hit-like structures with do-Chala roofs. The mosque tomb

of haji Khawaja Shabazz, (Fig. 57) (1679), and the mosque of Karta lab khan (1700) (Fig. 58), both in Dhaka, might have provided precedence's for such adaptations of the hut. Another example is stated to be that of Fath Khan (Fig. 60), this tomb, located in the Qadam Rasul Compound, constructed of stucco over brick, the tomb has a do-Chala roof (with a single curved spine and two curved eaves). Following the square single domed mosque type popular in Bengal, Muhammad Shah's Mosque (Fig. 59) is notable for its entrance portal, situated at the eastern end of the courtyard. This low rectangular building, with its do-Chala roof, recalls Fath Khan's Tomb at Gaur.



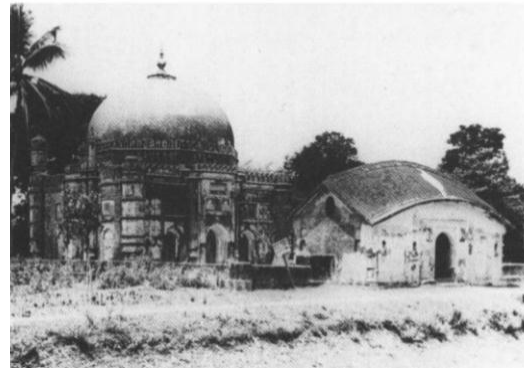
*Figure 56: Tomb complex of Khawaja Anwar-i-shahid (late 17<sup>th</sup> century)*  
Source: (Ahmed,1984)



*Figure 57: The mosque tomb of haji Khawaja Shabazz, (1679)*



*Figure 58: The mosque of Karta lab khan (1700).*  
Source: (Ahmed,1984)



*Figure 59: Muhammad Shah's Mosque (late 17th century)*



*Figure 60: Fath Khan's Tomb at Gaur (17<sup>th</sup> century)*

There were some other buildings with special qualities. The sat Gam bud mosque along the river in Dhaka received special attention in terms of sitting and location. It is quite unlike a mosque-site; it has more the ambiance of a kiosk, a pavilion on the water. Another interesting configuration is the two-storied mosque of Khan Mohammad Mridha, where the ground level is geared for street-oriented activity, while steps lead up to the more exclusive mosque level arranged as a large terrace with a free-standing prayer structure at one side. This is, in a sense, a miniature version of the Delhi Jami Masjid, but also has correspondence with the two leveled structure, Khel Aram dattar temple at Nawabganj, where the cellular labyrinthine character of the ground level is contrasted by the independent hut-like structures on the upper level. (Ashraf, 1997)

An important aspect of the late Mughal period is a flurry of temple building, which continued even more prolifically during the British rule. Many temples continued the tradition of earlier centuries, with elaborate brick and terra-cotta work, and glorified Bangla roof, but many began to adopt tradition from Turko -Persian repertoire and later British colonial architecture.

### **3.6.2.1 Terracotta Hindu Temples:**

Bengali Hindus, long under the domination of the North Indian orthodoxy, initiated new revivalism under this new spirit of tolerance. In the late 16th century, this happened in the form of Vaishnavism led by the saint Chaitanya. (1486-1533) This 'revolt' against Hindu orthodoxy advocated the abolishment of the caste system and leaned, in a way, towards monotheism in the sense that it

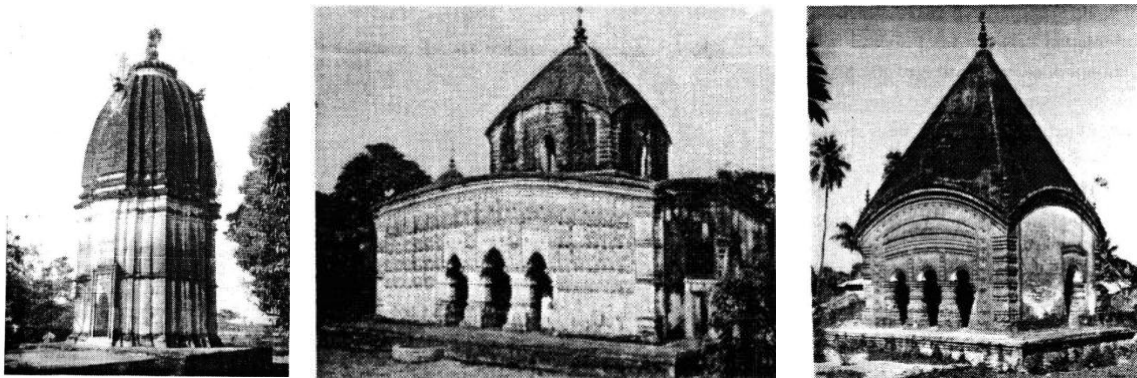
concentrated on one God-- Krishna, worship to whom was based on *Bhakti* or devotion. Its consequence was that it brought all people, irrespective of caste or creed, together. Literature helped to extend this philosophy to all levels of the Hindu society. (Haq, 1992) The development of the Bengal Hindu temple type took place during the period from the 16th to the 19th century (George.1983). By this time, the Mughal conquest had occurred and the imperial style replaced that of the local. The task of carrying on the indigenous tradition, therefore, fell to the Hindu temples. "Nearly all the surviving richly decorated temples of the sixteenth and seventeenth centuries are Radha-Krishna temples, and their terracotta decorations are Vaishnava, not merely in subject matter but in spirit..."(Cutchion,1983) The variation in the temple architecture came about due to their external appearance and not because of their structure (Mc Cutchion, 2004). Use of different roof structures in each temple determined the external form of these temples (Sanyal, 2012). The basic forms of temples that developed till 17<sup>th</sup> century A.D. are generally classified as (Fig. 61)

**1.Modified *Rekha Deuls*(shikhara)** – with a tower rising vertically up and gets curved at the end.

**2.Chala Temples** – with sloping roofs which are further divided into:

- a. Do-chala – having two sloping roofs with a central ridge.
- b. Jor-Bangla – twin ‘Do-Chala’ attached to each other.
- c. Char-Chala – having four sloping roofs
- d. AatChala – having a smaller ‘char-Chala’ added over a bigger ‘char-Chala’.

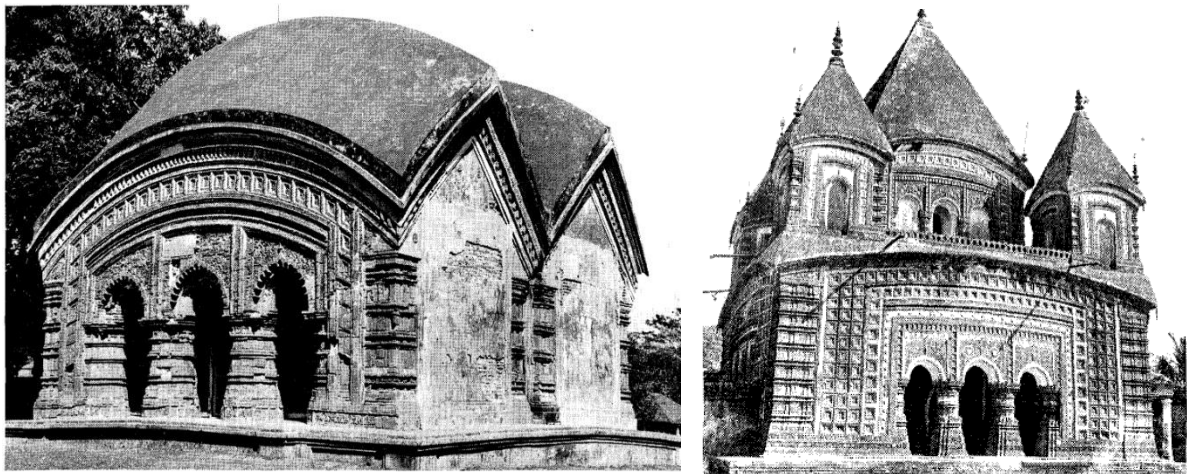
**3. Ratna Temples** – having a miniature tower above the main shrine. This can be ‘Ek-Ratna’ for one tower, ‘Pancha-Ratna’ for five such towers which went up to ‘Pancha-Vimsati’ Ratna for twenty-five towers.



*Figure 61: Different type of Hindu temples: a. Shikhara Type b. Ratna Type c. chala type.*  
Source: (Ahmed,1984)

This style is characterized by a cabin-like profile with sloping roofs, curved eaves, and exceptionally stunted pillars, richly embellished with intricate terracotta art. Excellent examples of the 17th century *Rekha-deul* type of temples in Bangladesh are the Mathurapur Deul in Faridpur, the Kodla Math near Bagerhat, Sarkat's Math at Mahilara in Bakerganj, the imposing Siva temple at Puthia and the Sonarang temples at Tongibari near Dhaka. The gently curved shikhara of all these temples are relieved with a series of horizontal brick moldings, bearing floral tracery and mythological episodes from the Hindu Epics and exhibit curved cornice decoration, reiterated from the base to the crest.

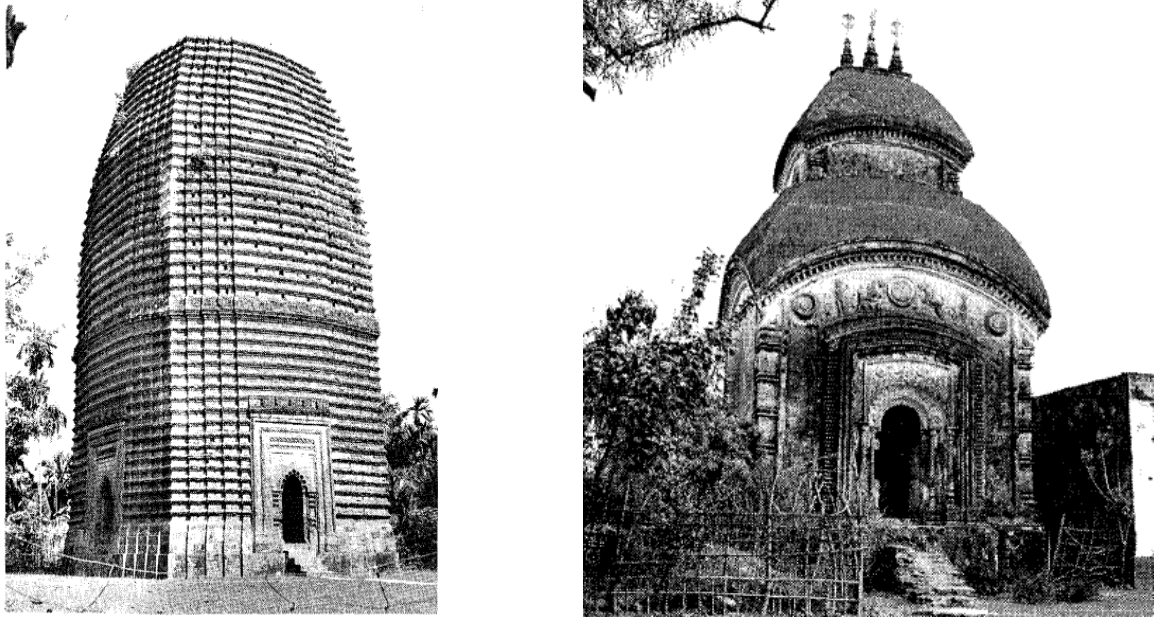
The main features of the popular Bangla style are a square sanctum, often more than one story, with a pronounced curvilinear elevation. The plan may be either on an elongated base with only two sloping roofs above or on a square base with four pitched roofs. A singular hut of this type is known as *Ek Bangla* while the two together are known as *Jor Bangla*. A four-sided roof with curved cornice on a rectangular sanctuary is called a *Char-Chala* but when a miniature duplicate is repeated on top, it forms an *Aat-Chala* or eight-roofed. Sometimes the receding series of roofs are triplicated, making it *Baro-Chala* or twelve-roofed. The facade of all these temples is invariably covered with a profusion of terracotta floral and figural art. Fine examples of the *Ek-Bangla* temples are to be found within the palace ruins of Bardhankuti in Rangpur, at Puthia near Rajshahi, at Handial in Pabna and many other old sites, while the remains of some elegant *jor-Bangla* temples may be seen at Dakhin Raghampur in Pabna town, at Raigram in Jessore, at Mulghar near Bagerhat and scores of others in Jessore, Khulna and Faridpur districts. By adding decorative towers or *ratnas* (literal gems) over the central cella, another distinctive variety of temple architecture was introduced in the medieval period. Clusters of between four and twenty-four such decorative miniature spires added at different roof levels in groups of 4, 8, 12, 16, 20, 24, etc. plus the central tower or *shikhara*, created a wide variety of *Pancha-Ratna* and *Nava-Ratna* types of temples. Some excellent examples of *Pancha-Ratna* or 5-towered temples are the Siddheswari temple at Naldanga and the Govinda temple at Puthia, while the Damreli and Sonabaria temples in Khulna and the Kantaji temple in Dinajpur are beautiful surviving specimens of the *Nava-Ratna* or nine-towered style. The only surviving *Satara-Ratna* or 17-towered temple in Bangladesh is the imposing octagonal temple near Comilla town. The other variants of the 21-spired temples have all disappeared now (Husain 2007).



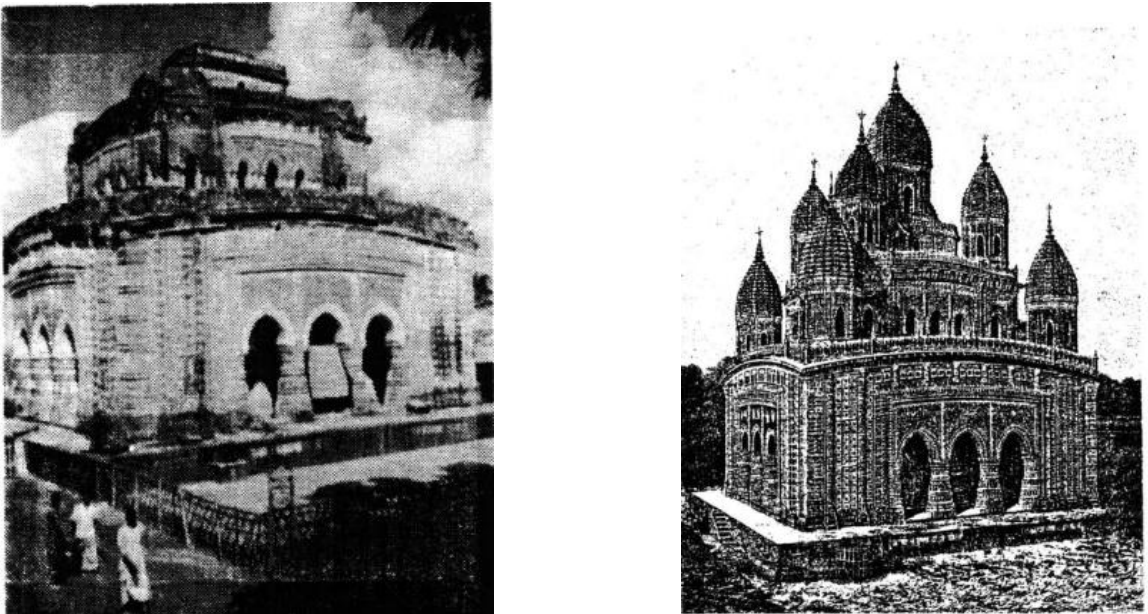
**Figure 62: (left) Gopinath temple at Pabna (*jor Bangla*), *At-Chala* temple (right)**

Source: (Ahmed,1984)





*Figure 63: Shikhara type temple (17<sup>th</sup> century) (left), Pancha Ratna Govinda Temple, Puthia (17<sup>th</sup> century) (right).*  
Source: (Ahmed,1984)



*Figure 64: Kantaji temple as existing(left), the original form of kantaji temple as depicted by James Fergusson.*  
Source: (Ahmed,1984)

### 3.7 European –Modern Influence (1757-1947)

The period of the late 18<sup>th</sup> Century was when it was the decline of Mughal Power and the advent or arrival of the Europeans. This was also the beginning of the British Colonialism in the Indo Pak Sub-Continent. With the imported concept of habitat and lifestyle, these 200 year-long eras of imperialism, furnished the complete overhaul of the social, cultural, and urban system. Political Aspirations of the British rulers were expressed in Architecture as well. Colonial influence has been explained by different authors in different ways, to some it was a transition between the traditional and the modern, to some colonial architecture is a product of Cultural contact while other believe it is a function of dependent peripheral capitalism. There is no need for such segmental explanations because all the interpretations hold true in different degrees for all colonial countries. There was never a homogenous colonial style, but there were, of course, the similarity of attitudes among colonizers that gave rise to certain patterns of development. The concept, such as stability and change in terms of architectural expression are quite complex, especially when applied to cultures with and already rich and strong building tradition that was suddenly brought into contact with imported ideas and tastes.

British colonialism resulted in an overwhelming contact with European culture that eventually coincided with global modernization, dominated by themes of science, rationalism, and technology. A complete overhaul of the social, cultural and urban system was precipitated (Ashraf,1997). A new range of Building Type was erected in the name of Office Building, Railway Structures, Bungalows, Warehouses, Hospitals, Colleges mostly in the capital city of Dhaka and in a few other divisional and district towns. Architectural strategies of the colonial system, as shadows of larger cultural policies, ranged from the haughty neoclassical presence as the Viceroy's Residence (later the high court) in Dhaka, and various buildings in Calcutta, to the more climatically and ichnographically suitable Curzon Hall (Nilson,1968) (Fig.33).

The building art of the British period passed through a succession of phases. The European Renaissance Style appeared in the 17<sup>th</sup> century, initially in the churches of Dhaka, and later was applied to secular buildings in the later part of the 18<sup>th</sup> century and 19<sup>th</sup> century another phase developed in which buildings with semi-octagonal or round corners and tall Doric Columns gained popularity. The revival of the Classical Graeco-Roman architecture, adopted in medieval Europe with its salient 'Orders' classified under Tuscan, Doric, Ionic, Corinthian, and Composite, became very popular in Bangladesh. The new architectural elements introduced during the 19<sup>th</sup> century was the semi-circular arch, the triangular pediment carried over semi-Corinthian, Doric or Ionic columns and other foliated motifs in plaster. This may be studied on a series of feudal palaces in the outlying areas and some buildings in Dhaka. One is impressed by the striking resemblance of many feudal palaces here, especially the Baliadi, Puthia, Ahsan Manzil (Dhaka) and Dubalhati Palaces, with the famous Senate House in Cambridge (1722-30), Old High Court Building, and the unusual little Greek Memorial inside the Dhaka University Teacher-Student Centre). although these have been considerably modified and enriched by local conditions.

As a regional entit, Bangladesh had been a unique modifier. All the external rulers excepting the British could be tempered and later on could be identified with the local people and culture. Maybe it is because all of them belonged to oriental cultures having similar values and also that they settled in the region. For the first time during the British rule, the ruling class remained as alien usurpers and failed to identify themselves with the local people. At a later the western educated Bangladeshi middle class assumed a similar role. However, indigenous values could not be eradicated.

Traditional histories are often influenced by Marxism when they are explaining or discovering Bengal history. Thus, they tend to begin with India in a kind of semi-feudal state, then go on to tell how it was colonized by the British, how it was politicized, and how it eventually earned its independence. The heroes of these narratives are the Indian elites: the elites, usually presented as the first Indians to gain any sort of political consciousness, are said to provide the inspiration, the ideas, and the values, for resistance and rebellion against the British rule.

### 3.7.1 Bungalow

While most buildings followed European models in some way or other, an original architectural event rooted to the Bengal Delta was the production of the “Bungalow” as a reconfiguration of the deltaic “hut”. If we go further and investigate Bengal hut, we can see other architectural form is also influenced by this hut. Bungalow of or belonging to Bengal. True Bungalows (say the purists) represent structural simplicity, efficient use of space, and understated style. The idea of the pavilion is manifested by many concrete forms. The bamboo woven hut on stilts and thatch on an earth platform are a straightforward example. And the bungalow also developed from this deltaic pavilion structure. “The solid centralized mass, constructed in brick out of social need and monumental urges, the Bungalow are the elaboration of pavilion idea.” Bungalow of or belonging to Bengal.



#### Bungalow

comes from ba. glā and banglā, words which mean, literally, “in the Bengal style (of a house).” In its original use bungalow referred specifically to a lightly-built single-story house, usually with a thatched roof, found in the Far East. ----Merriam Webster Dictionary

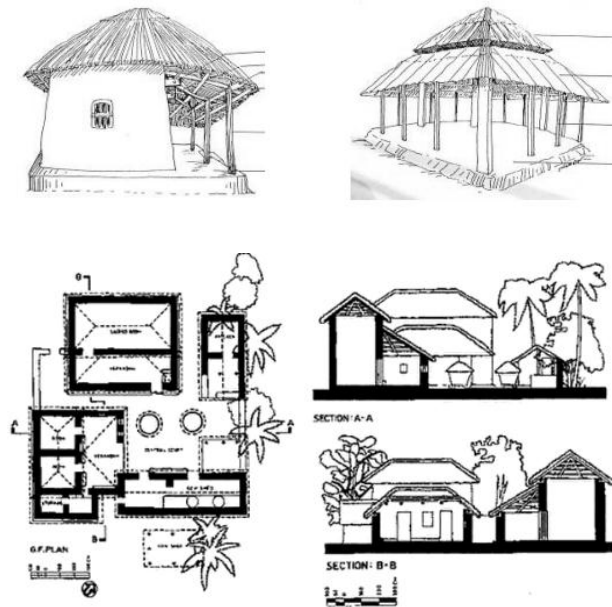
*Figure 65: First Bungalow in British India 1790 (Residential house)*

Source: (King,1995)

The bungalow epitomized the idea of dwelling in an isolated hut in nature under the assured shelter of a big roof from where one could look out into the distant horizon. Various forms and tectonics were employed for the bungalow but always derived from lessons learned from the climate and local idioms. However, within the colonial ideology of racial segregation, the bungalow also came to encourage spatial distancing and separation. It was soon transplanted as an architectural idea all across the subcontinent and later all over the world.

When the British came to India, working and living in an alien climate meant the need for appropriate spaces. As much of their work involved interacting with ‘natives’ in villages and rural areas, life under canvas for weeks on end became the norm. According to Anthony D. King, who has researched extensively into the origins of the bungalow, the earliest bungalow was a peasant’s hut in rural Bengal (Fig.65). Based on this prototype, by the last quarter of the 18th century, a new form of dwelling with a pyramidal thatched roof and kuccha (usually mud) walls were constructed. In the 17th and 18th centuries, Europeans in Bengal, prior to having their own more permanent buildings constructed, or when traveling “up country”, would sometimes use such locally built shelters in addition to their own tents. The main features of these shelters like the single story,

thatched roof, raised mud plinth, the square or sometimes oblong plan and veranda formed by the supports under the overhanging roof (Fig.66).



**Figure 66: Bengali hut and its pavilion structure.**  
Source: (www.google.com.bd)

The early bungalows were austere, with simple volumes and a stark whitewashed finish. They had long, low classical lines and detailing. This basic model developed into a more European classical form in outward appearance as time passed. It was symmetrical in form and largely so in spatial organization. It had a hall in the center and rooms on each side of the hall, and a veranda in front facing the garden and sometimes also on both sides. The kitchen and servants' quarters were separate in most instances. The pitched roof and surrounding veranda kept the bungalow cool in the summer months. (Fig.67)



**Figure 67: Early colonial Bungalow**  
Source: (King,1995)

An 1847 description cited by George Edwards (1907) describes what the bungalow of that era was- “ (A detached house) built for the most part of unbaked bricks and covered with thatch, having in the center a hall, the whole being encompassed by an open veranda. William Hodges provided an accurate description in 1793- “Bungalows were generally raised on a base of brick, one, two or three feet from the ground, and consist of only one story; the plan of them usually is a large room in the center for an eating and sitting room, and rooms at each corner for sleeping; the whole is covered with one general thatch, which comes low to each side; the spaces between the angle rooms are verandas or open porticos to sit in during the evenings; the center hall is lighted from the sides with windows and a large door in the center. Sometimes the center verandas at each end are converted into rooms.”(Fig.68)

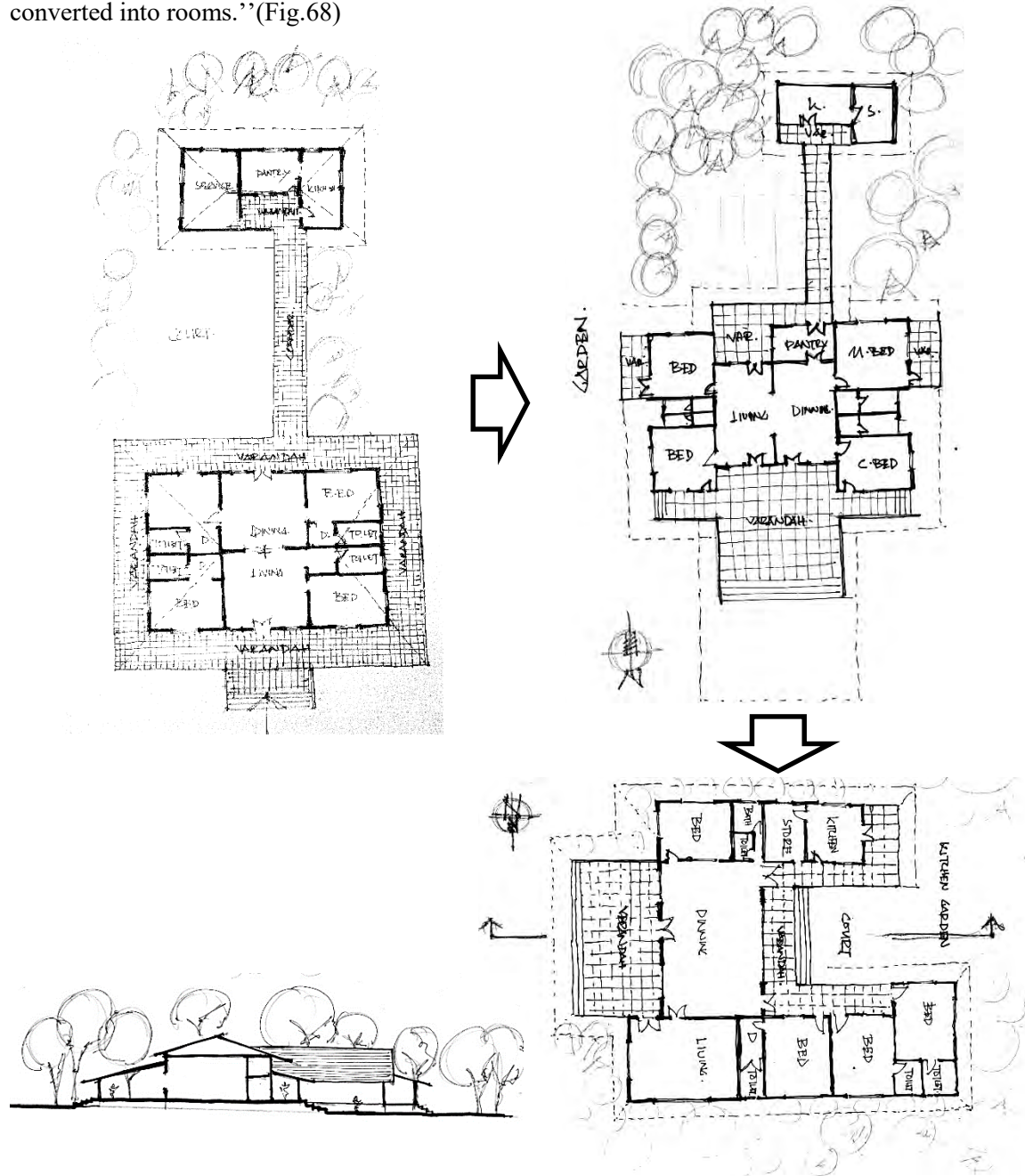


Figure 68: Transformation of Bungalow from Early colonial period to present days  
Source: (Prepared by Author)

The Bungalow style houses are still very popular in the rural Bengal. In the rural areas of Bangladesh, it is often called “Bangla Ghar” (Bengali Style House). The main construction material used in modern time is corrugated steel sheets. Previously they had been constructed from wood, bamboo and a kind of straw called “Khar”. Khar was used in the roof of the Bungalow house and kept the house cold during hot summer days. Another roofing material for Bungalow houses has been red clay tiles.



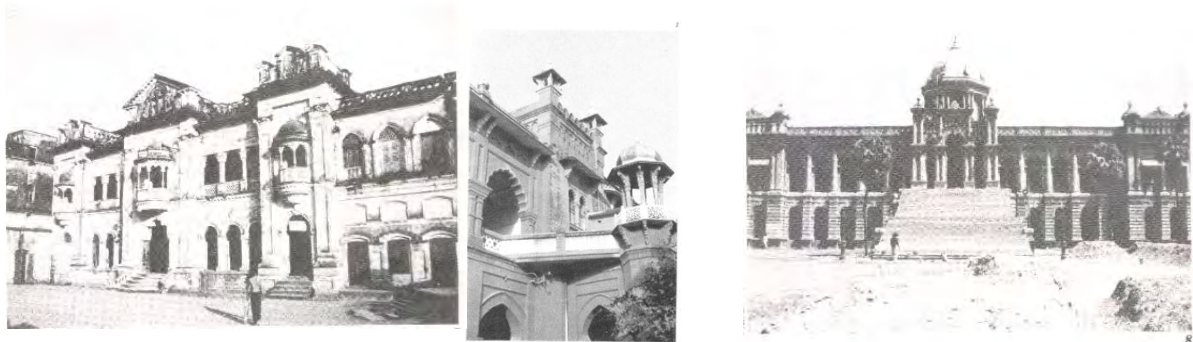
**Figure 69: A wooden bungalow which serves as Momin Mosque since 1920**  
Source: (www.google.com.bd)

The roots of the bungalow in Bengal lies with the British designing a standardized and permanent dwelling based on indigenous domestic structures for the East India Company. The basic model was adopted with modifications everywhere under British. The bungalow, though initially designed for an alien people, reflected the cultural bases of the Indian population among whom it was found. The architectural development of our deltaic subaltern region has the strength to serve the physical and spiritual needs of people, from a single family to the entire family. At the physical level, the built form of a bungalow, its embodied centuries of learning with regard to orientation, climate, building material, and construction techniques. At the spiritual level, the built form conveyed total harmony with the life style in all its daily as well as seasonal rituals, unifying the socio-cultural and religious aspirations of the individuals and community. Life style and activity followed in consonance with nature and architecture [bungalow] with nature.

### 3.8 Contemporary Adaptation (1947-1971)

The evolution of an indigenous modern style of building in Bangladesh focuses on architectural developments since 1947 when, on the other hand, conscious efforts have been made of responding to the local heritage and present-day aspirations, and on the other, to fit into the contemporary world situation. With the Partition of the sub-continent into India and Pakistan in 1947, this region entered into a feverish era of building activities in order to fulfill the need of the expanding capital of the province.

Two hundred of British colonial rule in the subcontinent had served the community of Bengali socio-cultural life and economy. Bangladesh was reduced to a hinterland of the capital city Calcutta, which flourished as a center of British commerce and administration. The first British building in this city were exact facsimiles of buildings in Europe which were in the neo-classical style in white plaster with Graeco-Roman visual features having no relation to the site, or the existing milieu of the region. Climatic consideration forced a change in the European buildings and gradually a hybrid style evolved using local architectural elements, such as an overhang eave, wooden lattices, verandas, etc. the old governor's residency, the Curzon Hall, the medical college (the old secretariat) and the Northbrook hall in Dhaka are a few examples of hybrid style (Figure 70). The first formally trained architects started practicing only from 1953.



*Figure 70: Hybrid style European buildings in Bangladesh.  
(left) Bhajari lodge, Dhaka (an upper class residence, early 19<sup>th</sup> century), (Middle) Ahsan Manzil, the nawabs palace, Dhaka(1872),(right) Curzon hall, Dhaka(1904)  
Source: (Magazine (A+D),1988)*

The '60s saw a flurry of building activity with many expatriate architects at the helm of the practice. The Department of Architecture of the Bangladesh University of Engineering opened its doors in 1962. A dedicated group of academics and practitioners delved into the complex problem of developing architecture sensitive to the local climate, people and materials. Constantine Doxiadis, Paul Rudolph, Louis Kahn, Robert Boughey were among the architects whose work gave a definite direction to that quest for architectural identity. The subsequent quest for situated modernism responsive to the land and people was shaped by the efforts of the architects who despite all the odds remained steadfast in the '60s. It may now be interesting to apply this analysis to some contemporary works of architecture in the country. Examples are taken from those where serious efforts are made to create an identifiable architecture which has contributed to their acceptance in the minds of the people at large.

Faculty of Architecture building; (Fig 71) Designed by Richard Vrooman, who was also the Dean of the Faculty of Architecture and Planning, the building initiates a rich dialogue between the campus, the students and even the passers-by. His intention was to design a building which would exhibit what modern architecture and architectural education could give to the country. This building expresses the architect's deep sensitivity and understanding of the tropical monsoon climate, the open-ended nature of the people and rugged materials and construction technology of this region. The south facing studio floors, anchored firmly to the ground with the solid curved walls of the east and the west float above the ground with the deep cavernous voids of the verandas.

To optimize the flexibility and openness of the studios without being extravagant, the architect used an oblique grid to create large clear spans. This oblique grid infuses the structure with a dynamic rhythm. The architect intended to use precast sun-breakers but they were later cast in-situ. Vrooman's effort to re-interpret the essential elements of the delta pavilion in the idiom of modern architecture has certainly bore fruit in many more dimensions than seemed plausible in the fledgling '60s.

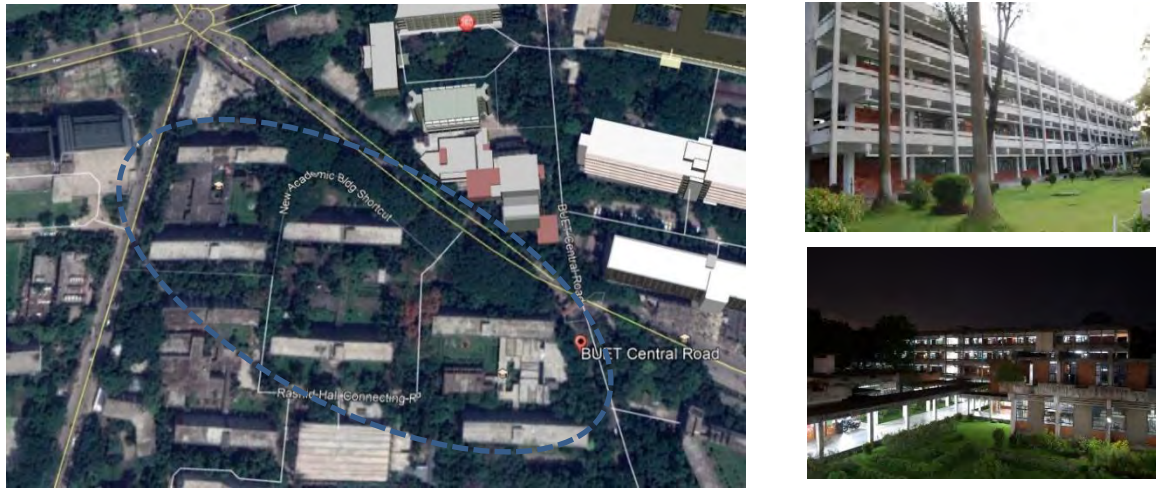


**Figure 71:( left) Google earth image of Architecture Department of BUET, Dhaka, (right) Academic Building of Architecture Department.**

Source: (<https://www.google.com.bd>)

Boys Hostel, BUET (Fig 72) (Shere-Bangla Hall, Titumir Hall and Shorawardi Hall), the architect skillfully articulated structure, shading devices, and deep verandas to protect the building from the elements and in doing so simultaneously achieved an open, light and airy, almost ethereal quality quite unprecedented at that time. The two wings of student's residences frame the inner courtyard which contains the common rooms, dining and prayer spaces. The kit of parts approach materials and structure has been deployed as a unifying theme. Its exemplary functional appropriateness, overall responsiveness, and scale have an ageless quality. The choice of simple materials and finishes have withstood the trials of time gracefully. The repetition of the three hostels creates a fine-grained cluster on the southwestern part of the campus.





**Figure 72: Boys Hostel BUET, Dhaka.**  
 Source: (<https://www.google.com.bd>)

Constantine Doxia Des's work is an example in which both curved elements and courtyards are used in a conscious attempt to relate to Bangladeshi identity. A remarkable expression of formal composition in courtyards, the Bangladesh Academy of Rural Development<sup>1</sup> in Comilla (Fig 73) and the Teachers-students complex of Dhaka University (Fig 74) recall the introverted character so common in the vernacular. The setting created is one of tranquility and serenity. Although the elements are there, the architect did not take their interdependency into consideration, something very important to a sense of architectural identity in Bangladesh. The vocabulary is highly responsive to the climate: shading, enhancing natural air flow, and protection from the rain was of obvious concern of the architect. The understanding of the role of shaded semi-open spaces and open spaces in our cultural context is exemplary. The structures and courtyards are unintegrated and remain as two entities without cohesion. Flowers in the courtyard and a grassy character take away the symbolism of 'white purity', which would have existed in the rural courtyard. The relative failure of this endeavor perhaps emphasizes the fact that relationships of form and space in Bangladesh have more profound meaning than merely visual effects.

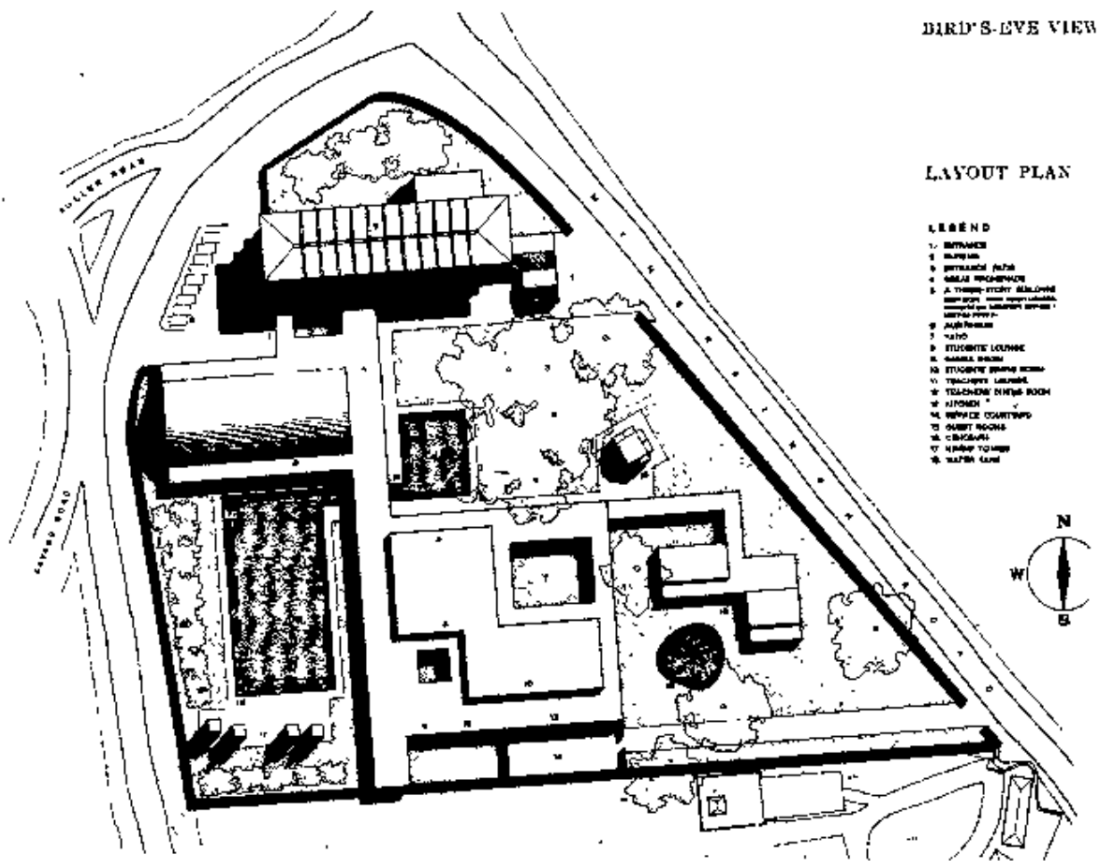


Figure 73: Site plan of TSC, Dhaka  
Source: Chowdhury, 1999



Figure 74: Showing Shaded semi-open spaces and open spaces of TSC, Dhaka  
Source: (<https://www.google.com.bd>)

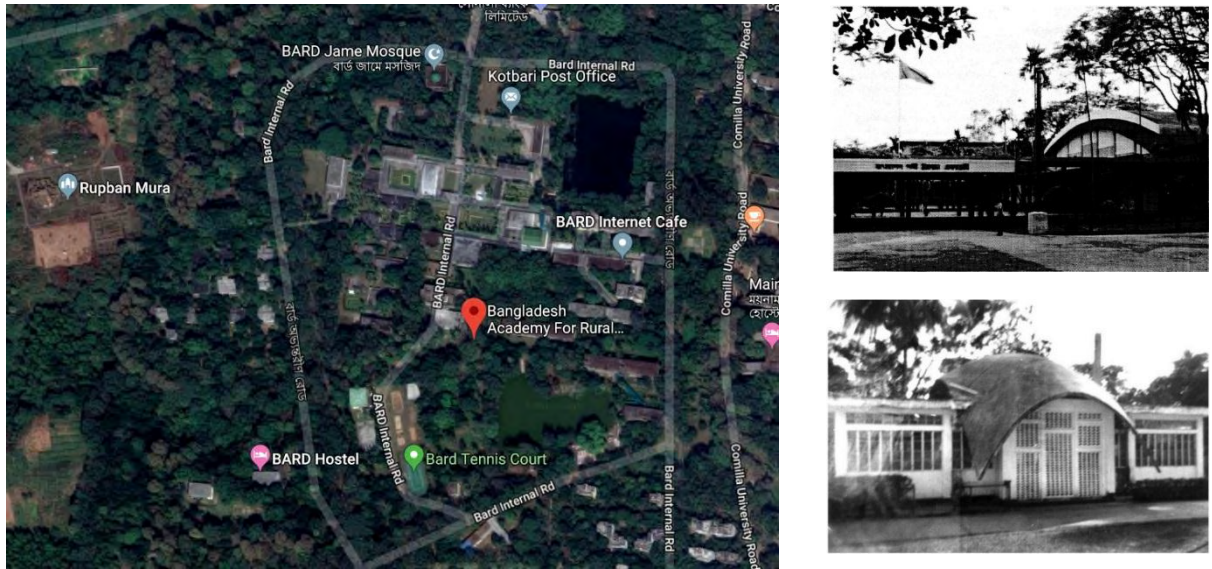


Figure 75: The Bangladesh Academy of Rural Development in Comilla  
Source: (<https://www.google.com.bd>)

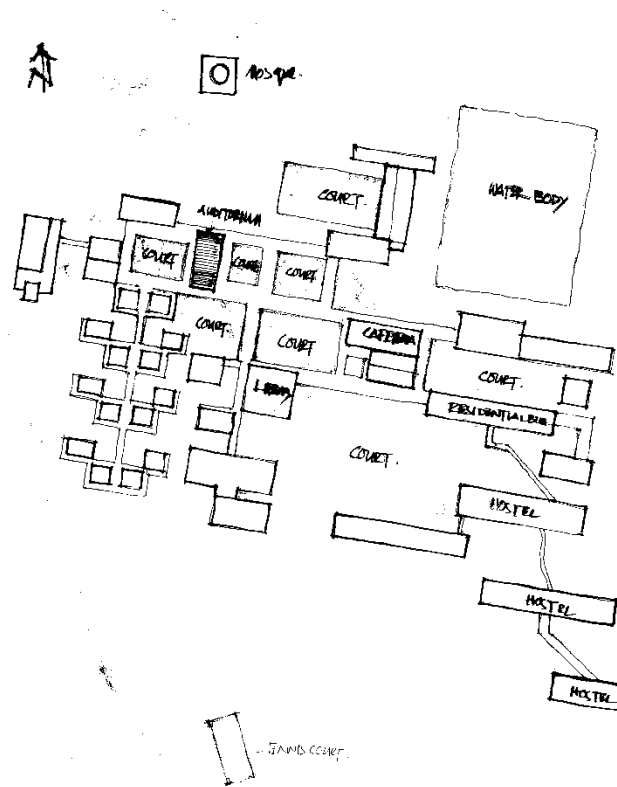


Figure 76: The Bangladesh Academy of Rural Development in Comilla, showing role of shaded semi- open spaces and open spaces in our cultural context  
Source: (prepared by Author)

## Chapter 04

## Formal Signification in the Bangladeshi vernacular house

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*Study mere shelter, now for him, and him;  
Nay, even the worst just house them! Any cave  
Suffices; throw out earth! A loop hole? Brave!  
... But here's our son excels  
At hurdle weaving any Scythian; fells  
Oak and devises rafters; dreams and shapes  
His dream into a door post just escapes  
The mystery of hinges. ...  
The goodly growth  
Of brick and stone! Our building-pelt was rough,  
But that descendants' garb suits well enough  
A portico-contriver.*

\* \* \* \* \*

*The work marched: step by step a workman fit  
Took each, nor too fit one task, one time-  
No leaping o'er the petty to the prime,  
"When just the substituting osier lithe  
For brittle bulrush, sound wood for soft with,  
To further loam-and-rough-cast work a stage,  
Exacts an architect, exacts an age."---- BROWNING.*



## Content

### 4.1 Vernacular architecture in Bengal

### 4.2 Architectural Manuals According to Khana

### 4.3 The Traditional Homesteading Pattern of Bangladesh

### 4.4 "Bengali House" basic dwelling unit and its Form

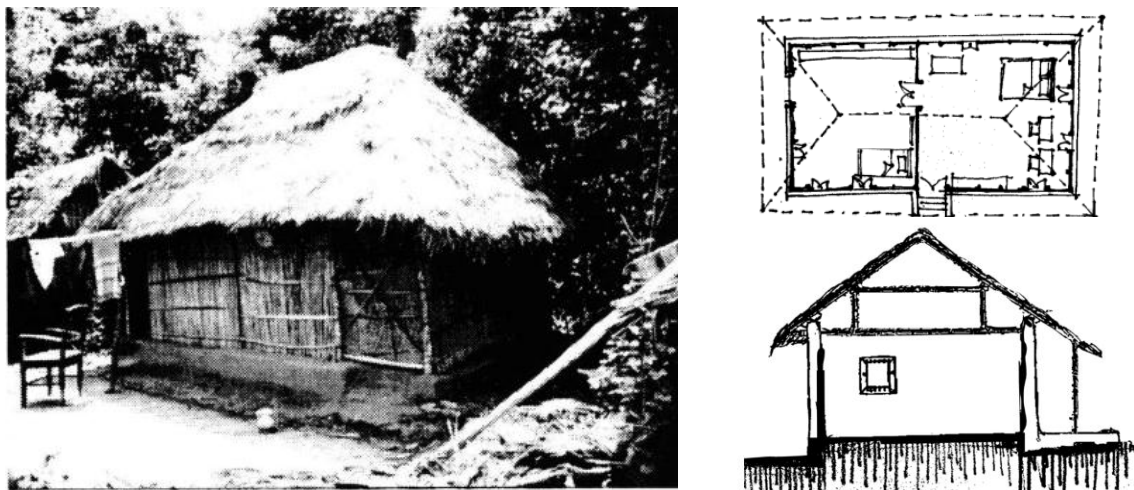
### 4.5 Socio-cultural factors and house form

## 4.1 Vernacular architecture in Bengal

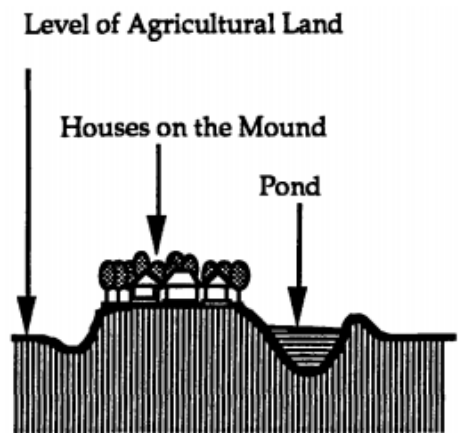
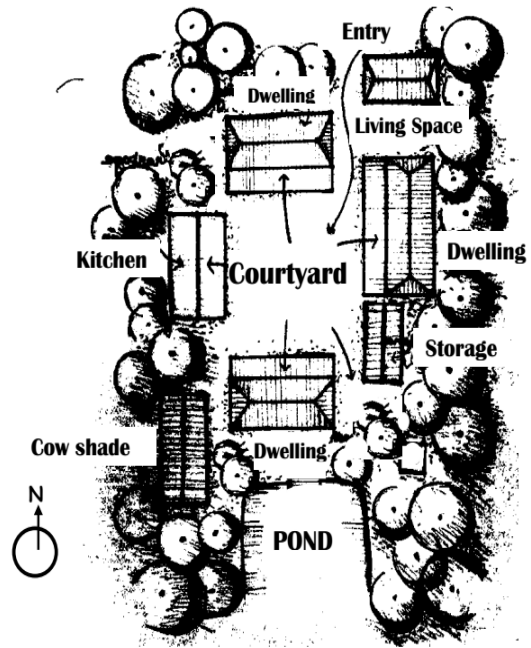
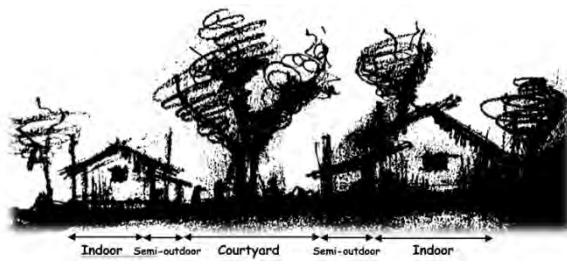
Our land, which is crisscrossed by numerous rivers, causes regionality. But regionality created by rivers has a unified multiregional cultural Condon. History of Bengal is a history of Imperialism. Invaders like Aryans, Mongols, Turks, Afghan invaded India through west and their influence in Bengal was felt much later in modified form. If we look back to understand our historical and cultural matrix in the perspective of world narration, we would always find a space of difference-fragmented and episodic history. The forces of history and tradition of settlements in Bengal is holding diverse ethnic, imperialistic cultural and religious beliefs.

Vernacular architecture examines the dwellings, religious and agricultural structures, fortifications, village formations and settlement patterns of the same subaltern societies, and the difference is defined through criteria of function, environmental and climatic concerns, and formal, three-dimensional qualities of space. The 15th and 16th century saw the true upsurge of a Loukik (vernacular and folk) Bengali culture. Two streams characterized the region. The domain of the pandits who's authority came from the Vedic Sastra, and the vernacular stream, the domain of the plebeians, the dweller of the villages and rivers, whose practices relied mostly on localized belief and rituals. Subaltern practices their own way to build dwelling unit as well as bungalow (regenerated from the hut) through emerging vernacular sense on the other hand civilized elite group established and patronized the bungalow as a style for pleasure home. Indigenous architecture has a clear relationship with the collective consciousness, relation with the soil, cultural behavior and values and norms. The subaltern, for the historical period, made their dwelling respect with material articulation and other lattice of intensity and contextuality (Ashraf,1997).

The integral relationship between pavilion and environment is also the key to complex organization, from simple shelter to clustering to complex patterns, and finally, form a deltaic city. Deltaic morphology implies the disposition of isolated building in a fabric of paddy fields, gardens, orchards, lake, and ponds. Clusters are formed by grouping pavilion 'unit' in a series, or around an amorously interiorized space (the courtyard) (Fig 77 & 78) city- forms east of the Bengal delta in the 'rice culture' matrix, where the distinction between urban and rural morphology has not been so oppositional, and building took their place in the natural milieu with minimal turmoil.



*Figure 77: The Unit of Production (A invisible pavilion of Bengal village)*  
Source: (Ahmed 1984, Hassan 1985.)



*Figure 78 : Bengal Village in a fabric of paddy field. (Top). A pavilion structure (Bottom).  
Source: (Ahmed 1984, Hassan 1985.)*

#### 4.1.1 The Ancient Village



**Figure 79: Ancient village in Bengal**  
Source © photography by Anthony Denney).

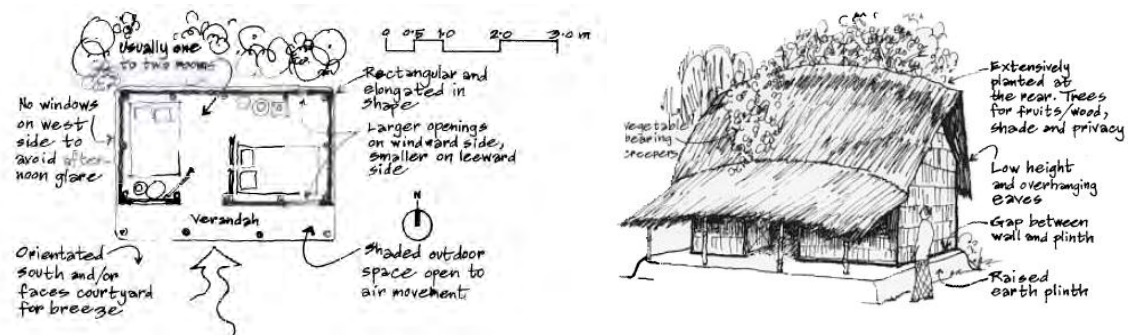
Like the present time, in the ancient period also, people of Bengal mostly lived in villages. The copperplate inscriptions and contemporary literary works relate many details about these villages. These were situated near the banks of river, canal, ditch, tank, and marsh (Fig 79). Epigraphic evidence shows that the two main parts of a village were habitation land (*Vastubhumi*) and land for cultivation (*ksetrabhumi*). Besides most of the villages had vegetated highlands, meadows for cattle grazing, cattle tracks, cart track and sometimes canals excavated for irrigation and embankments. In some villages, there existed marts, shops, temples of gods and goddesses and *viharas* or monasteries. Some villages were situated near public roads (*rajapatha*). Some villages had forests, groves of bamboos and large trees like the *Mahua*. From these forests' villagers collected wood fuel and from groves of bamboos, they gathered bamboos and posts for constructing houses. The wood of the large trees was also used for the construction of dwellings and for making furniture for everyday use (Husain,2007).



**Figure 80: Bengal village showing villagers outside thatch houses, bullock cart near the roadside, (Photography by Samuel Bourne,1863)**  
Source: (British Library)

Contemporary inscriptions and literary works leave no doubt that the basis of the rural society's economy was agriculture. The agricultural products not only provided food, clothing and other necessities for the village people, paddy and other food crops, spices and salt of Bengal together with fine cotton textiles were items of export trade from very early times and this export trade constituted one of the main sources of ancient Bengal's wealth till the end of the 7<sup>th</sup> century AD. In villages, people built dwelling places in the area marked for habitation called *vastu*. Dwelling houses were generally built of mud, thatch, bamboo, and wood. Roofs were constructed with thatch, for walls laths of bamboo were used. Posts of the houses were of wood or bamboo. In East, Bengal walls were made by weaving bamboo laths. In West and North Bengal walls of houses were made of mud. The poor cultivators lived in grass cottages. Old delta dwelling gradually turned into more permanent material like 'mud' houses and new delta remained more transient in nature (Fig 80). The statement made here is based on archaeological and literary evidence and seems to be applicable from the Maurya period to the end of the ancient period (c. 1200 AD). From contemporary literary evidence, it seems houses of well to do classes had several rooms and a courtyard where sometimes stood a budding mango tree. In the roof tops of some buildings, there were one or more rooms which were screened by mats against rain. From one verse quoted in the anthologies *Subhasitaratnakosa* and *Saduktikarnamrta* we can form some idea about the house plans of well to do classes:

*She comes to the center of the house  
and then to the front hall.  
At last, she steps out in the courtyard .... (Alam, 1982)*



**Figure 81: Villagers who lived in leaf or grass or thatched houses over the one room on which pumpkin vines sometimes grew.**

Source: (Mowla,1997a)

But people of the low-income group lived in two roomed houses. The compound of these houses was walled. For water supply urban people depended on rivers, tanks and ring wells. They also knew the use of bathrooms. The ladies of the royal household lived in harem or inner apartments meant specially for them and sometimes an officer called *Vasagarika* was in charge of the *Vasagara* or the inner part of or the bedchamber of the king's palace. Following the royalty, the upper-class people most probably kept a separate apartment for women in their dwelling houses. In the villages, like in the present time, people with means used to keep outside houses or rooms called *varagrha*. But the villagers *who* lived in leaf or grass or thatched houses over the one room on which pumpkin vines sometimes grew, could not possibly provide any separate rooms for women, though they might have divided their respective small huts into two by partition as is done in Bangladesh even today (Fig 81). But the poor people residing in village or town who led a hand to mouth existence



could not keep any apartment separate for their women as the whole family lived in one single room which served as a bedroom as well as kitchen and husking shed. In the rainy season houses built of mud and thatched with hay sometimes became dilapidated with walls of mud melting and the hay of the roof scattering (Alam, 1982)



**Figure 82: Earliest villages of Bengal**  
*A 'Hut' is a small single-story mostly rectangular building of local construction-serving as a temporary or permanent shelter for the people of this delta.*

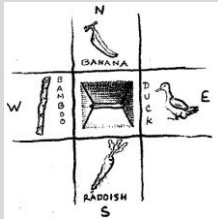
Source: (www.google.com.bd)

## 4.2 Architectural manuals according to khana.

The maxims related to vernacular architecture, belong to the meticulous observation of subaltern astrologer Khana; ancient Indian poet, philosopher and legendary astrologer, is considered in the literature as a lady of olden times who authored the famous sayings; which are still popular in the rural society of Bangladesh. The attributed date of her lifetime ranges from 400 AD to 1200 AD. According to one account, she lived in the village of Deuli in Barasat in 24 Parganas, West Bengal. Khana suggesting that the composer/composers were intimate to this land and acquainted with the ways of life here in Bengal. She directed the people when architecture was not directed by any architect. In our socio-cultural context, Khona is an indispensable part of rural architecture. Rabindranath Tagore introduced her maxims are likely to natural rhythm or folklore rhythm in the creative minds of subaltern people for its spontaneous progression. The maxims can be divided into three categories: planning, construction treatments considering public health and agro-based landscaping. If one account for the built-forms of vernacular architecture of Bengal, one might not disagree according to *Khona*; where she urged that the house should be built in high and arid land over a spacious platform. Her suggestion that a spacious courtyard is needed where light and ventilation should be enough and keep balance in all year round regardless of winter or summer. The allocations of rooms according to functions are also discussed in her maxims.

### 4.2.1 Khana's maxims indicating House planning

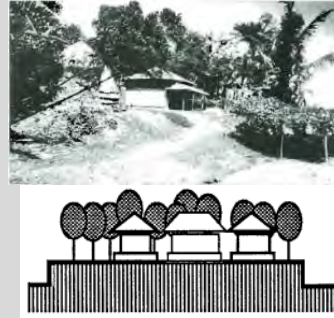
First of all, let us consider some quotation of Khona for a complete plan of vernacular architecture of Bangladesh. This is the most famous proverb regarding traditional architecture and is found almost the same with some exceptions in Bikrampur, Pabna, Faridpur and West Bengal (Nawaz,2011).

	<b>Khana's bachan</b>	<b>Pronunciation</b>	
1.	দক্ষিণ দুয়ারী স্বর্গ বাস উত্তর দুয়ারী সর্বনাশ পূর্বে হাঁস পশ্চিমে বাঁশ	Dokhin duari shorgo bash Uttor duyari shorbonash Purbe hasha Poshchime bash	 <p>depicts a total planning duck in the east, bamboo in the west, banana in the north, left empty in the south, build your home taking all the area of the high and spacious platform.</p>
	পূবে হাঁস, পশ্চিমে বাঁশ উত্তরে বেড়ে (কলা), দক্ষিণে ছেড়ে, ঘর করগো পোতা জুড়ে ॥	Pube hash, poschime bash, Uttare bere, dakkhine chere, Ghor korogo pota jure.	
<p><b>Meaning:</b></p> <p><b>Duck in East:</b> Khona preferred east side for farming the poultry. Again, this is the traditional practice of Bangladesh to dig a pond in the site first, to erect the plinth and walls from these cut earth. This can be referred to as “cut and fill”. In addition, evaporation of water from pond associated with south breeze helps to reduce the heat and humidity. Thus, allocation of the pond in the east is an environmental treatment for the climatic consideration of Bangladesh.</p> <p><b>Bamboo in West-</b>means the cluster of bamboo trees should be on the west side in an optimum distance. This treatment is only to protect from the west sun and keep the house and entire courtyard cool, providing calm shades and shadows.</p> <p><b>Banana in North-</b> means plant banana trees in the north side. Profitable trees like banana could be planted as the height of this tree is small and do not obstruct the passing of winds of south-north orientation. Again, north is the source of defused light and it is charming for the dwellers.</p> <p><b>Left empty in South-</b> let the wind flow to penetrate the homestead and define this cardinal as an entry. This is exactly somewhat that was inscribed in <i>Sanskrit</i> in <i>Charak Shanghita</i>'s 12<sup>th</sup> chapter, during 200 AD – “The happily southern breeze, which increases the purified span of life.” In other opinion, hedges or</p>			

vegetables such as reddish and carrots can be planted in the south side of any house which is not a problem for proper ventilation as well as receiving the breeze of the south.

2. মনে যদি লই কসর,  
পোখরি পাহাড়ে তুলিব ঘর ॥

Mone Jodi loi kosor,  
Pokhori pahare tulibo ghor.



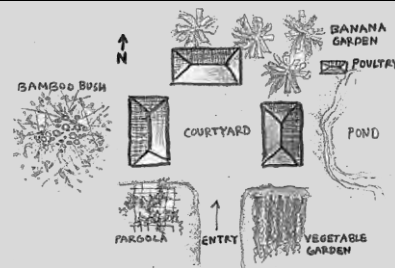
Bangladeshi villages are generally situated on slightly raised ground and maintain a horizontal relationship with adjacent fields.

**Meaning:**

**Build your home taking all the area of the high and spacious platform-** a relationship with the maxims of Dak of Assam can be found in this regard, which means that one should build one's house in the high land if one is intended to.

3. দখিন দুয়ারী ঘরের রাজা,  
পুব দুয়ারী তাহার প্রজা,  
পশ্চিম দুয়ারীর মুখে ছাই,  
উত্তর দুয়ারীর খাজনা নাই ॥

Dokhin duary ghorer raja,  
Pub duary tahar proja,  
Poschim duarir mukhe chai,  
Uttar duarir khajna nai.



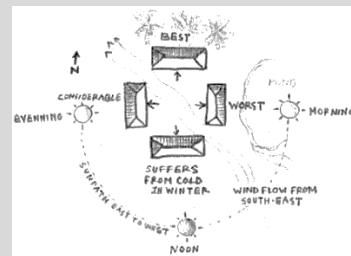
The pattern of vernacular architecture of Bengal. Land, trees, and water are the elementary ingredients of the village, and from these have evolved the main themes of rural architecture.

**Meaning:**

Literally, this rhythm depicts a total entrance system- the south oriented room is the best, east oriented room is quite comfortable, west oriented room is worse but the north oriented room is the worst. If a door is erected against the south, the dwellers get sick recurrently as the air contains pollution and cannot pass the room by cross ventilation. This is collected from *Dhaka, Rangpur, and Bogra*.

4. উত্তরের ঘরেরা দুধে ভাতে,  
দক্ষিণের ঘরেরা মরে শীতে,  
পশ্চিমের ঘরেরা খায় ভাত,  
পূবের ঘরেরা ফেলে পাত ॥

Uttorer ghorera dudhe vate,  
Dokkhiner ghorera more shite  
Poschimer ghorera khay vat,  
Puber ghorera fele pat.



Entries from four directions according to her maxim

**Meaning:**

This maxim is based on environmental design and it means, the dwellers of northern rooms having a door in the south are enjoying the best condition. Again, the dwellers of southern rooms having a door in the north suffer from cold wind during the winter. Besides, the dwellers of western rooms having a door in the east are quite good but the dwellers of eastern rooms having a door in the west are unfortunate as light and wind cannot reach them. Despite erecting a built-form in the east, a pond is to be dig. This is collected from *Bikrampur*, the ancient capital of during the **Pala (Buddhist) period**.

	<b>Khanar bachan</b>	<b>Vernacular architecture</b>
<b>Orientation</b>	North-South orientation	North-South orientation
<b>Access</b>	From South side	Usually South side
<b>Openings</b>	Door and window. The entry door is located in the south. East and west are more solid than north-south.	Door and window. The entry door is located in the south. East and west are more solid than north-south
<b>Size</b>	Small house	Small house)- jhupri, kutcha, semi-pucca houses
<b>Roof</b>	Pitch roof ( Chala)	Pitch roof (dochala/chouchala )
<b>Plinth</b>	Local techniques and labors	Local techniques and labor. Mostly bamboo, brick and mud construction.
<b>Materials</b>	Mostly bamboo, mud, thatch	Bamboo, mud, thatch, brick, tin
<b>Construction technique</b>	Local techniques and labors	Local techniques and labor. Mostly bamboo, brick and mud construction.
<b>Courtyard/ Uthan</b>	Courtyard oriented settlement	Courtyard oriented settlement and very prominent character.
<b>Organization of house form</b>	Centralized	Centralized

*Table 7: Comparative analysis between Khanar bachan and Vernacular architecture House planning*  
 Source: (Prepared by the author)

### 4.3 The traditional homesteading pattern of Bangladesh

The folk architecture of Bangladesh is primarily embodied in village homesteads. These express characteristic ways of life, practical and spiritual needs, and tastes. Traditional house building techniques have gradually evolved into a unique system of architecture. Since prehistoric times shelters have been created from necessity. They evolve spontaneously and cannot be created artificially. (Fig.83) Bangladeshi villages are generally situated on raised ground and maintain a horizontal relationship with adjacent fields. Usually, a river, lake, or swamp is nearby. A village may follow the serpentine path of a river as an equally continuous flow of green. Land, trees, and water are the elementary ingredients of the village, and from these have evolved the main themes of rural architecture. Practical considerations such as climate, rain, solar incidence, and patterns of light and shadow also determine the design of the village and the dwelling. The main intention of this architecture is the ease of use and comfort. Families living in villages are joint in nature,"? The age-old picture is of "a storehouse full of rice, a pond full of fish, and a house full of relatives," A simple approach to life, agriculture-based comparable production capability, religious consciousness, and a peace-loving nature - these qualities of people's lives have remained unchanged, leading to a specific type of architectural layout, In brief, the "place" formation of the courtyard-centered layout and its related architectural theory is only possible from this point of view.

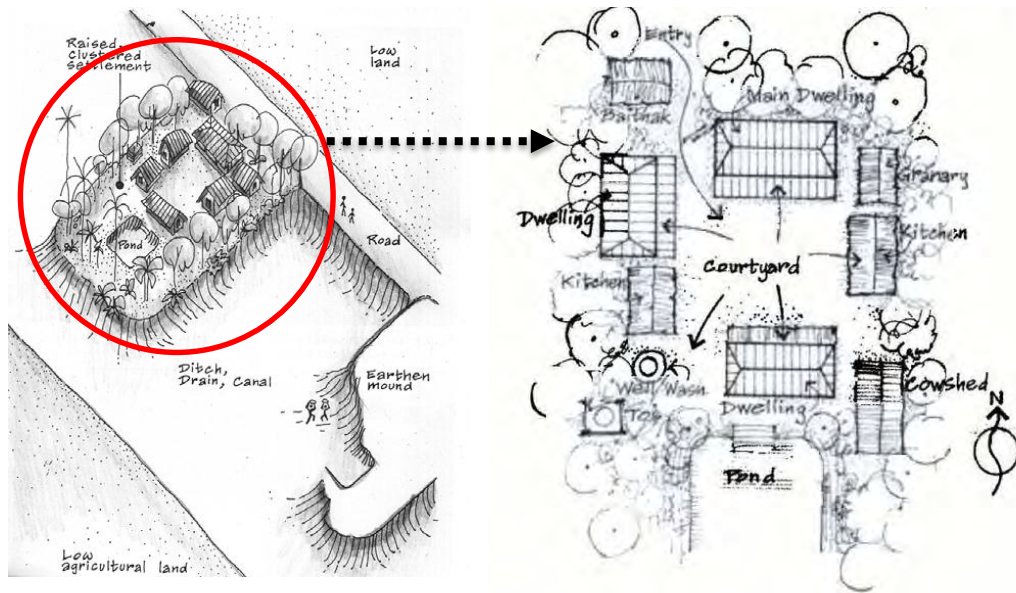


Figure 83: The rural settlements characteristics and built form

Source: (Hasan, D. M., 1985)

### ***Plinth or Vita:***

The Bangladeshi act of creating a homestead starts with the raising of a mound, a mud platform that demarcates a place for the house from the surrounding landscape. This is called *vita* or plinth. It demarcates the area of the entire house and has more significance for the people than the structures that are built on it. Here small platforms are made for individual dwellings to protect the shelter from rainwater runoff which becomes their plinth. Thus, raising of the mound is a social phenomenon and it connotes a place to live, an address. So strong is this sense, that even the homeless when asked about their background, speak of their *vita/Bari* (Hasan, 1985). The creation of this platform requires large excavations which results in ponds, tanks, ditches, etc. They are used for water storage supply and drainage for the house. Besides that, they also create a sense of privacy by distancing the house on it from others. This phenomenon of the *vita* is ubiquitous in Bangladesh and can be understood as a logical response not only against the annual floods but also for creating dry places to contrast with the wet rice fields, it also helps protect from the surface runoff (Fig 84).

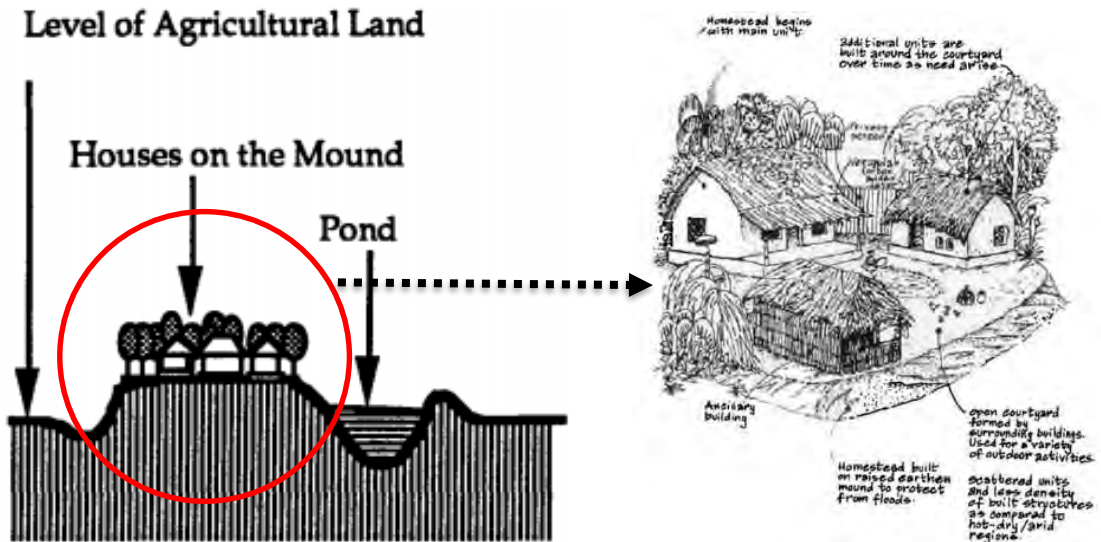


Figure 84: Homestead built on raised earthen mound to protect from floods.

Source: (Hasan, D. M., 1985)

**Bari or hut:**

The next act is the construction of the actual huts. When a homestead is constructed, ponds are excavated first and a mound raised with the earth obtained. A family starts living on the site in a simple hut called ‘Ghar’ meaning room, but gradually their requirements increase and their hut becomes insufficient. On this *vita* various huts and open areas are arranged to create the home or the bari in its basic form, the house is a cluster of small huts/*Ghars* arranged around a central courtyard called *uthan* in *Bangla*. Each of these huts/ *Ghars* is functionally separate. Generally, they are sleeping huts, kitchen huts, *katchari*, and a cowshed. When subdivision takes place, the huts of the *bari* retain their individuality (Hasan, 1985). They may be transported to new locations or new huts may be added to the cluster, but generally, they are not enlarged (Fig 85).

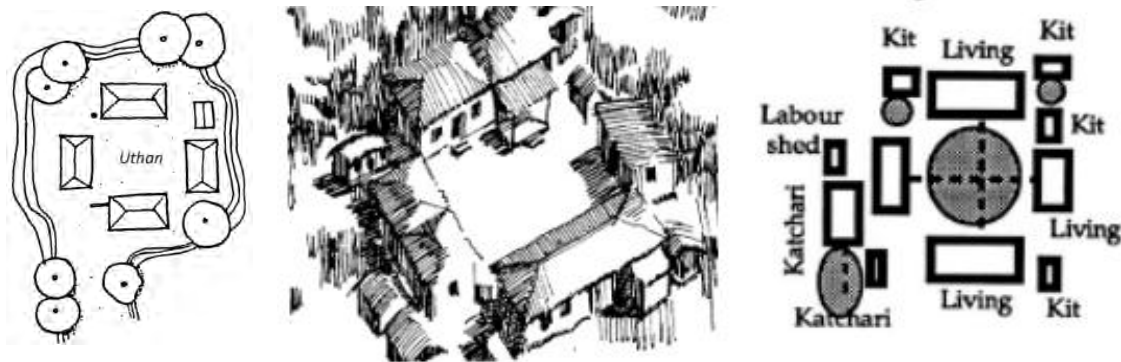
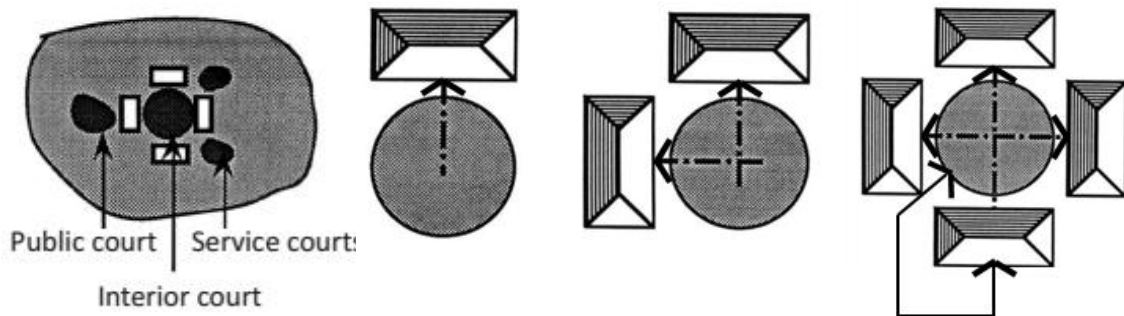


Figure 85: On top of the mounds, the Bengali house (*bari* in Bengali) is usually a cluster of constructions arranged around a courtyard (*uthan*)

Source: (Hasan, D. M., 1985)

***Courtyard or Uthan:***

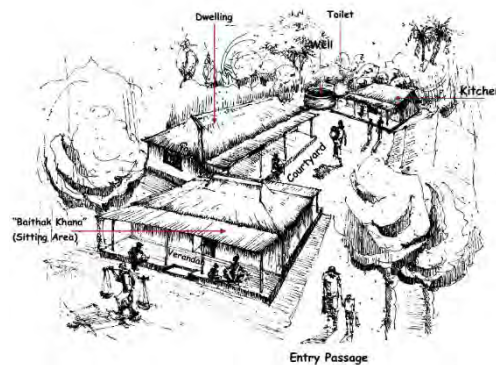
In each compound, the main building will always have a courtyard in front of it. These courtyards are plain, have no plants and are very well maintained. More structures are gradually added, creating an enclosed a courtyard, or *uthan*, in the center. The owner of the house, usually the farmer or his eldest son, is given the best location beside the *uthan*. This is usually the northern structure, which faces south. According to age and position in the family, each person is assigned other huts. If there is a need for more than four structures, a larger courtyard is created, with two huts on either side. Extended families may have more than one courtyard. Under the open sky, every bit of the *uthan* is usable space. The quadrant has many purposes: it is a place to dry clothes or crops, a play area for children, a location for elders to converse, an arena for story-telling or musical events, and a site for ceremonies marking birth, marriage or death (Hasan, 1985). It is also the ring where petty family quarrels occur and where their solution is arbitrated. During the monsoon, when water is everywhere, the courtyard may become a pool, and residents may throw a line from their door and wait patiently for a bite. It is also here that the children may float banana leaf rafts or a tube well (Fig 86).



**Figure 86: Formation of yards as central spaces when huts are built as needs evolve.**  
Source: (Haq, 1992)

***katchari Ghar or reception structure:***

Just at the entrance of the homestead is a large hut in an open area, called the *katchari ghar*. In the Western sense, it is a reception structure, and it is sparsely furnished with a few sitting arrangements (benches, one or two chairs) and possibly a wooden chowki. A small room in the corner is used either as guest accommodation or as a study for children. The cattle shed is nearby, and between it and *katchari ghar* is a series of earthen jars set in get their first lessons in swimming (Haq 1992) (Fig 87).



**Figure 87: Traditional homestead, A unit of Production**  
Source: (Alam,2018)

***Kitchen or Roshoi Ghar:***

When houses are complete on the four sides of the *uthan*, a kitchen structure is constructed on the northeastern corner. All around the area are planted coconut and betel nut trees, and demarcation is completed by a jute straw, bamboo, or bean vine fence, which also ensures the privacy of women. Inside is the *dheki*,<sup>29</sup> looking like a huge wooden crocodile on two legs. At the northwest corner of the *uthan* is located a women's privacy and well, and similar features for men can be found in a nearby dense growth of cane. Beyond the kitchen is a small pond, a well, bamboo frames to store fodder. There is also a bamboo-framed structure supporting an earthen container or a huge pail, big enough so that two or three cows can drink together from it. Near the kitchen is a small structure which is used when necessary as a place for giving birth. In Hindu homes, there is also a hut for the deity nearby (Haq 1992).

***Ghat:***

When the sun sets, the women go bathing, either in the *Ghats* of the pond or the river. Privacy is needed here, too, and the coconut-trunk steps that go down to the water are screened on both sides by bamboo fencing. Just beside this ghat is a huge hog-plum or tamarind tree, the fruit being a special delicacy for expectant mothers. All these elements - water, trees, huts, and courtyard - are the necessary constituents of a rural home (Muktadir & Hassan 1985).

***Graveyard:***

The final element of the compound is the family graveyard, lying just beyond the garden. The different elements needed progressively in a lifetime can be all be found in folk architecture in an astonishingly simple manner. Today's institutionalized architecture does not strive to fulfill all these needs or be so deeply connected to the man. Folk architecture is created for all the needs of life - from birth to death. Life and architecture are completely united (Muktadir & Hassan 1985).

**4.4 “Bengali house”-basic dwelling unit and its Form**

**4.4.1 Organization of the house**

The Singular presence of the Pavilion Structure is the rustic “Bengali hut,” which is essentially a roof meant to thwart the intense sun and the torrential rain and the walls, which are permeable to the movement of air and placed well within the perimeter of the roof (Haque, 1997). These huts have features like verandahs, terraces, and semi-enclosures which create a dramatic relationship between inside and outside. A traditional “Bengali house” is an inheritance from the past, exist in the present and has a potential for the future. The traditional house in its basic form is a cluster of small “shelters” or “huts” around a central courtyard called “uthan”. The individual huts may constitute of the following categories:

The outer house (out house/Bangla Ghar/Kachari Ghar or Baitak ghar) The inner house (dwelling unit or Ghar) The kitchen The cattle shed	<b>Larger house may also include the following:</b> The store house (Gola ghar/fuel storage, granary etc.) The rice husking shed or ‘Dheki Ghar’.
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The huts are usually single roomed, detached and loosely spaced around the central court. Extensive landscaping and the surrounding environment. The latrine and bath are never considered as parts of



the main structures and are always kept at a distance. The combination of all the huts is called the 'Bari' or the 'home'. In the traditional system, 'Bari' represents the nuclear, joint or extended family while the huts represent individual living units. The courtyard or 'uthan' serves to maintain both unity and individual identity of the families in the house (Fig 88 & 89).

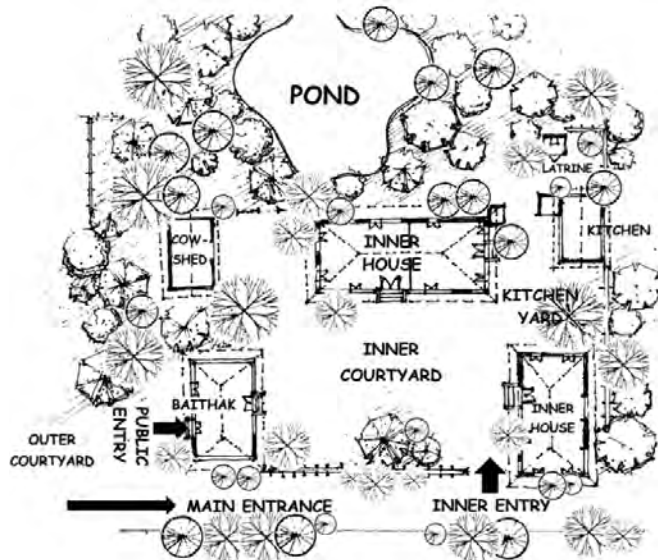


Figure 88: Features of a Typical Rural Homestead  
Source: (Hasan, D. M., 1985)

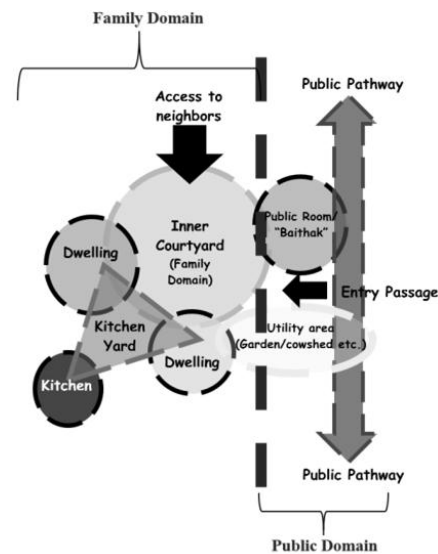


Figure 89: Space morphologies of a traditional homestead of Bangladesh

#### 4.4.2 Functional level

The organization of a traditional house in rural Bangladesh is done with respect to the functional uses and activities of various spaces. Outdoors are an initial part of the Bengali house.

##### The family functions

Those pertaining to the family itself i.e. sleeping, cooking, food preparation, recreation, taking care of the cattle's, preparation of the agricultural products, etc.

##### The formal functions

The homestead is separated into two distinct parts: the inner house and the outer house with respect to a family function and formal function respectively. This inner and outer house concept is a special characteristic of the traditional house form in rural Bangladesh. The house beyond satisfying the functional necessities of the family embodies an expression of human hopes, aspirations and identity and his relationship with the community and the environment in which he lives. The organization of the house is not only affected by the functional requirements of the daily life but more importantly from the culturally defined social codes, customs, and norms. The traditional house form evolved rather slowly through the inquiries under the influence of many factors working simultaneously- the land, the culture, the climate, the available resources and so on. The basic form of a traditional rural 'Bengali house' is essentially a 'shelter' with respect to its climatic context and a 'social unit of space' with respect to its cultural context.

### 4.4.3 The land

By creating a land (or a mound) for the ‘house’ the act of homesteading in the Gangetic plains starts. The land for the homestead is raised above the flood plains demarcating from the surrounding agricultural land. The shape, size, and height of the ‘mound’ vary from place to place. In some places, especially in the high lands of Madhapur and Barind tract, there is no need to have the elaborate raising of the land for the homestead, even though in practice, the homestead is demarcated from the rest of the land by slightly raising it. This also helps to protect it from the surface run off. In most other places, however large excavation and earth work is done, while creating this ‘mound’ and also while progressively enlarging a house by creating ponds, tanks, canals, drains, etc., in and around the homestead. This is the ecological (service) bases of the house and they also play significant roles in ensuring privacy by creating barriers from the next homesteads and thereby generating the loose, distributed settlement pattern. After the raising of the land for the proposed homestead, various shelters, huts, and open spaces are organized on it gradually the ‘house’ takes its shape.

### 4.5 Socio-cultural factors and House Form

A ‘shelter’ is a basic need for a human being for protection against hostile natural elements and the ‘form’ the house takes depends on how the needs for the ‘shelter’ are defined and perceived by the particular group of people. Here culture in general directs the interpretation, choice and specific solution to certain needs. The different parts of the house, assume a social meaning according to the nature of the individual, social needs and the consequent uses made of such parts. This social meaning of different parts shapes out a mental image of the parts in the minds of the inhabitants. All the arrangements and users are structured in the house by the local perception of privacy, which defines appropriacy and dictates necessary measures to secure the space and the result in the inner house and outer house.

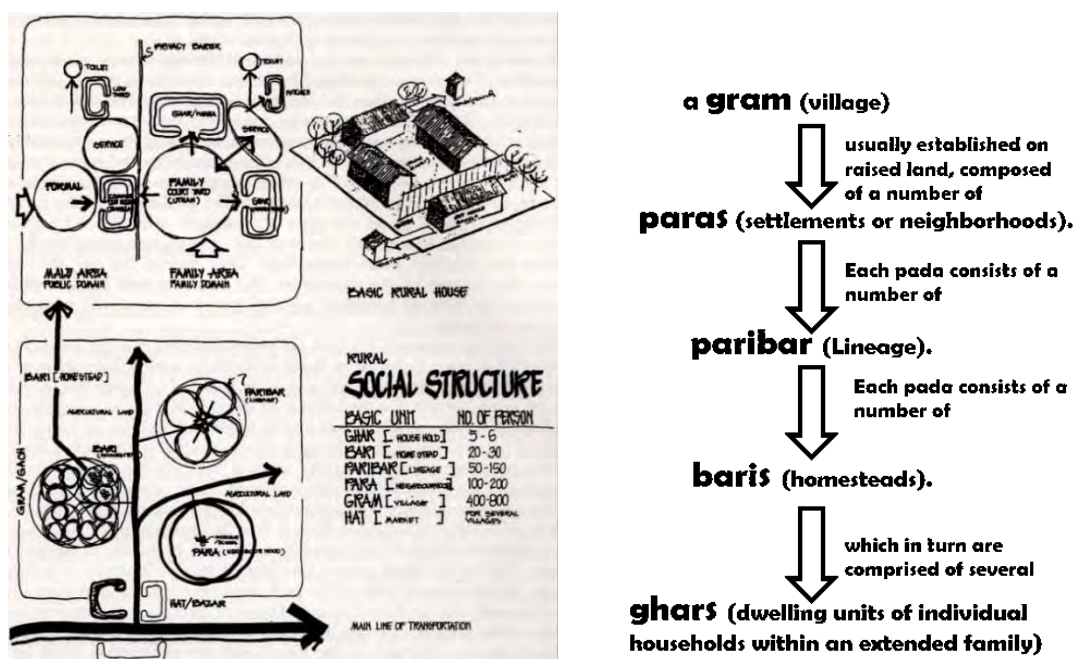


Figure 90: Figure: Transformation of social structure into physical form

Source: (Mowla,1997a)

The joint family consisted typically of three to four generations. The preparation of food, its consumption, ritual observations, sanitation practices and caste belief and practices (the population being predominantly Hindu) governed all systems of social behavior. The nucleolus of social structure was household (*Ghar*) and homestead (*bari*), neighborhood or mahalla (also called *para*) was mainly composed of family lineage (*paribar*) (Fig 90). The social structure was similar to the contemporary traditional structure in Bangladesh. Physical manifestation of family-level out-door activities gives rise to uthan or courtyard house and *galies* or lane/by lanes. Male head of the household occupied dominant and better locations in the settlement. Worship was on a household basis and individual-centered. (Nehru, 1956, p.82)

In Bengali culture, 'privacy' is achieved through visual perception and male/female separation (Fig.90) Visual privacy is achieved by using physical devices, which includes organization and orientation of shelters, the partition between the inner and outer house, indirect entry to the inner house and so on. All these have made the traditional house form of rural Bangladesh "introvert type". In every household, there will be a separate room with a verandah named "*Boithak Khana*," or Sitting Room, for outside people to come and socialize. The courtyard forms a social center of the house that promotes maximum interaction of family members and even interaction with the neighbors. It provides a natural setting, some furniture to sleep or relax and sitting areas for family discussions, all within the privacy and safety of the house. This courtyard is also a place where essential family functions, small cultural programs, and even religious formalities take place. Kitchens are oriented in such a way that women can easily maintain household activities from there (Hasan, 1985). The kitchen yard is linked up with the central courtyard with a privacy barrier to having more privacy for the female members. (Hasan, 1985)

The architecture of the Delta is a part of the architecture of the Islamic world, as well as Indian Architecture before the advent of Islam in the sub-continent. Islam has influenced these traditional houses. The maximum build-out of a household has an inner court with surrounding verandahs, mainly used by women. The central Asian settlers influenced the late indigenous phase and had the houses typified by an inner uthan(courtyard), more or less similar to earlier typology. This *uthan* was the central meeting place for the joint family. The private spaces were strictly segregated from public spaces, courtyard, though generally attributed to the central Asian and Middle Eastern cultures well adapted to warm humid Bangladesh due to its similarity to the older indigenous uthan and house form. In the house of the wealthy, there was likely to have two uthan, one for the *bhitor bari* or inner house and another for *bahir bari* (Bangla Ghar) or outer house, each flanked by rooms with female and male domain respectively. In the house of those who are not so wealthy, rooms would be arranged around a single *uthan* with a front room facing the street functioning as the entertaining area for males. In the precolonial city, uthan was the basic module for the organization of living spaces. Earlier social structure in Dhaka got further consolidated by this time, under a more compact urban context. Prevailing mahalla typology was derived from the social interaction of families.

The corresponding built-form provided for western culture at Dhaka was the Bungalow-compound complex (king, 1976, pp.90-94, 123-155). the typology derived from the indigenous '*Bangla ghor*' typically consisted of a large, single storied dwelling, located generally at the center of large enclosed plot. The servants 'quarters were located at the backyard, detached from the main building (Mowla, 1997a, p, 264). kitchen was also generally detached or at the rear part of the main structure. The house was normally being occupied by husband and wife only with children away in the

convents. High value was placed on land owning and property in the form of housing as a symbol of status, on canons of aesthetic taste ultimately derived from past civilizations of Greece and Rome, and on a close attachment to the world of “nature” (Glacken, 1967, p.33). Front lawns were carefully arranged and cultivated to expose their status and to suit “garden parties”, the backyard was assigned to services.

#### **4.5.1 Religious belief and house form**

The characteristics of a traditional ‘Bengali house’ is firmly based on the religious convictions and the cultural identities of the rural populace. The Muslim monotheistic belief system largely influenced late indigenous phase and had a community based on the principle that faith not kinship acted as a social bond. The tradition began from a Muslim notion of center, although not metaphysical but symbolic idea of the earth and the heavens and of the manifested center which becomes a geometric or physical center (Mowla, 1999). In the Muslim religion, there is only one God, who deserves all worshipping and who’s house on earth is the Kaba in Mecca which serves as the qibla for the prayer of the faithful. Kaba (Mecca) is the global level of the congregation of Muslims. The hidden axis inevitably determines the orientation of the mosque and also the alignment of the principal streets at whose intersection the rectangular space of the mosque has to be nudged in nicely. The auspicious orientation also governed to some extent the layout of bedrooms and toilets in the dwellings. Belief in the immortality of the soul and the custom of prayer for the salvation of the departed souls give rise to the need of family burial ground (Mowla, 1999).

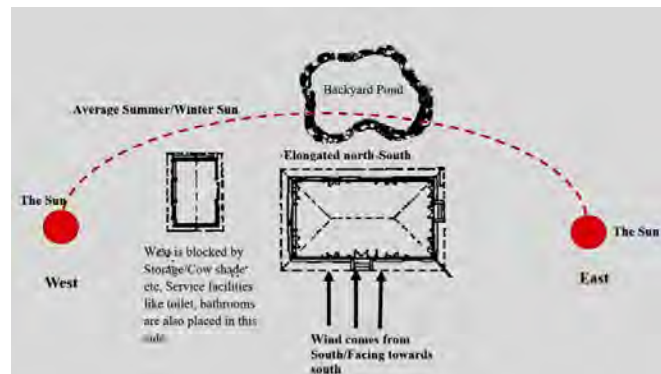
The Hindu homesteads do not exhibit any such concern for the cardinal directions. In particular, although the East is considered a sacred direction because the sun rises in the East. The Hindu homesteads are organized on the basis of particular places of ritual purity, both indoor and outdoor. Thus, a corner of the inner courtyard is marked as a place of ritual purity, the ‘Tulsi Tala’ (Hasan, 1985). Generally, religious observance was at an individual and family level which was expressed in the domestic shrines in each house and the many small temples that were scattered throughout the city. The colonizers had a monotheistic system of belief. In contrast with the previous practices, there was marked distinction between sacred and secular activities.

#### **4.5.2 Climate and house form**

##### **The Orientation of the Building**

The relationship of sun, wind, and light with the building is usually considered while making of these traditional households. People always try to make these structures south facing as the wind comes from the southern hemisphere and the primary concern of the building process is to avoid the hot summer sun. Nevertheless, the orientation of these traditional buildings is deeply related to the climate. Characteristics of the hot-humid area are high summer day-time temperatures, high relative humidity, and little diurnal temperature variation. (Guide, 2016). Bedrooms/Dwellings should be placed in the direction of the prevailing wind for proper natural ventilation. Kitchens should have cross ventilation. For this, eastern or the southeastern/western corner is the best for kitchens (Fig 91). In some parts of the country, especially southern coastal areas, the pond is an essential part of the house and has manifold uses. Homestead ponds are used for multiple purposes including washing, bathing, watering livestock and irrigation for dyke or homestead vegetable production. In addition, many households excavate soil with which to raise the base of their homes in order to avoid flooding. As a result, many households in rural Bangladesh possess a small pond

close to their homestead (Huda, 2009). Moreover, a house is surrounded by perennial trees giving protection from sun, storms, and cyclones and also offer a degree of privacy (Pond Aquaculture in Bangladesh, 2010).



*Figure 91: Basic thinking behind the building orientation.*

Climatically, the best orientation is south, because it is from this direction that the soothing cool breeze of the summer comes. Since the cold winds flow from the north in winter, it should be avoided. Again, western orientation is notorious because of prolonged exposure to the sun's rays, which heats up the hut. Eastern orientation is a possible second to the south. Therefore, the best orientation in these terms would be a long row of huts in a line facing the south. In reality, we know that the houses are four-square and therefore face in all cardinal directions. That the orientation is not ignored, is revealed by closer scrutiny. The huts are divided by ranking so that the most important person takes the most comfortable hut and so on. This idea of orientation is deeply-rooted in the average Bangladeshi. On more than one occasion, the author has experienced the stubbornness of clients who refused to have their modern urban house oriented towards any other direction than the south, even when layout and approach demanded otherwise.

## Comfort

A Bengali household is an organic development and an example of vernacular architecture. The household also has influential semi-outdoor areas, shaded courtyards and well-ventilated indoor areas having sufficient window openings for natural light. Therefore, these traditional deltaic households are comfortable places in which to live, in the sense that these homes are examples of climatically adapted and have been built meticulously with local materials. These traditional Bengal houses have sufficient windows and doors. Therefore, wind passes through them quite easily. At the heart of household is the courtyard that protects the interior spaces from direct sunlight. In some regions of the sub-continent, the courtyards serve the purpose of being rainwater collectors. The functions of the spaces are flexible, and their usage is adapted according to the time of the day and the seasons. In summers, most of the time, people prefer to stay in verandahs or in the courtyard where the plantings provide fresh air. Sometimes a perennial tree is planted in the middle of the courtyard in order to protect residents from the hot summer sun. However, in the winters, people prefer courtyards during the day to gain maximum heat from the sun. All traditional Bangladeshi households have one or two separate kitchens (Fig: 2.16) to avoid hot air and smell, especially during the hot summers.

### 4.5.3 House Form

#### Geometry

geometry is concerned, the room shape determined by the enclosing walls are almost universally rectangular. Rectangular shaped houses range in size from 10'x15' to 15'x25'. In some cases, a veranda is added, width not more than 5 to 6 feet. The size of the house varies with the economic ability and social status of the occupants. Size and layout of a rural house are determined by 'bandh' (length +width='Bandh' in hand unit or 'hath'). There is a prejudice that the 'Bandh' must be an odd number—which commonly varies from 13 'hath' to 27 'hath' (1 'hath'=.45 met). Besides 'hath' there are other traditional units of measurement like 'Bighat' (half of a 'hath') and 'angel' (width of a finger). These are more detailed measurements. Height of the plinth varies in different regions within .3m to 1.2m. height of walls varies from 2.1m to 3.6m. (Hasan, 1985) (Fig 92).

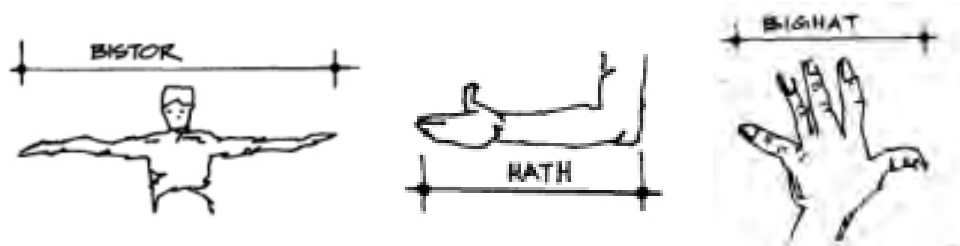


Figure 92: Human body-based measurement units.  
Source: (Hasan,1985)

#### plan

The hut is of rectangular shape. The huts are relatively small and rectangular in plan with the length varying from 12 feet to 24 feet, and the width varying from 9 feet to 15 feet. They are built on the ground with the floor raised about 1 foot to 1.5 feet from the ground level ostensibly to safeguard them from the temporary water logging of the site in times of torrential downpour. Each plinth is usually made with rammed earth. The height of the hut is quite low with minimal openings in the walls which are protected by a sloping, stooping, overhanging roof structure.

#### Roof

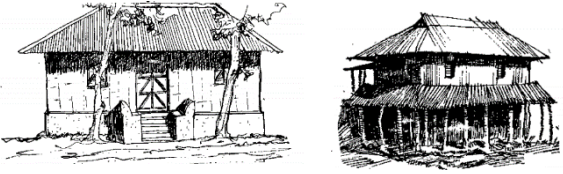
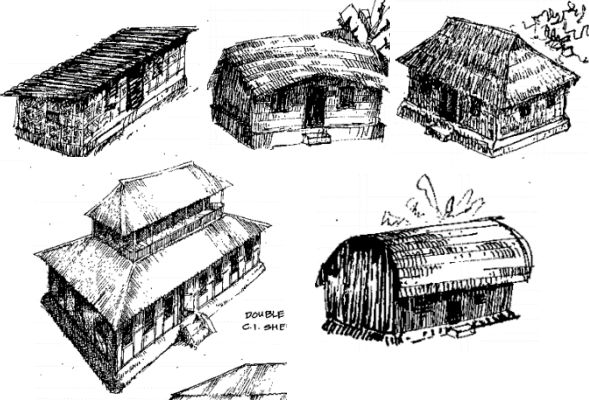
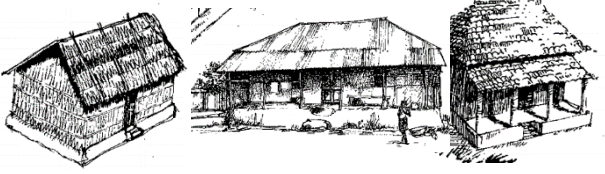

Rural houses offer their varieties mainly in roof shapes, and roof always is the dominant character of a house. The pitched roof is common in rural houses. A variety of pitched roof are there—single pitched ('Ek Chala'), hipped ('char chla') of 30-40 deg slope (Table 7). Other than a pitched roof, humped roof and barrel vault type roofs are also seen which are usually thatched roof. The humped roof is a pre-tensioned roof structure to counteract the load of the thatched roof when it is heavy under the rain. (Hasan, 1985)

#### Window panel

To protect the house from strong winds, a piece of bamboo is inclined against the bamboo posts as a brace. Thick wires may also be used for this purpose, tied to wedges buried in the ground. Windows are generally kept in the south, east, and north sides of the dwelling. Window panels are mostly of bamboo or wood and are hung from the top, and doors are made of the same materials. Eaves usually project far outside the wall line to protect the walls from sun and rain. The pitched roof structure, with its many angled planes, resembles a series of little pyramids.


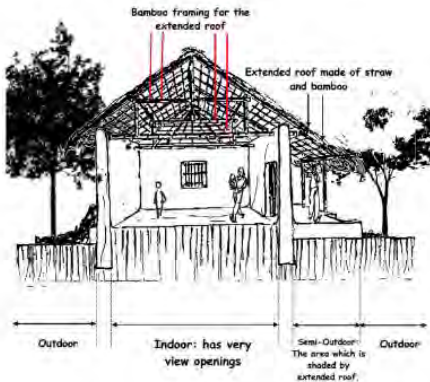

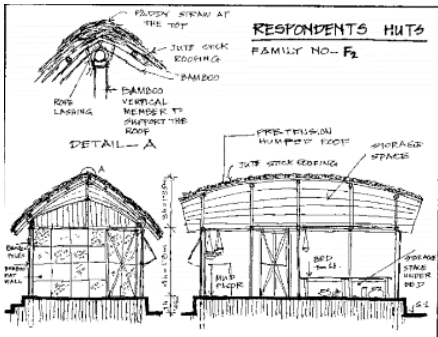
## Types

Vernacular houses (*kutchas*) vary depending on their location. In the recent plains (75% of the country) the main vernacular building material is bamboo, in the Pleistocene uplands the main material is earth and in the hilly regions the main material is traditionally wood but deforestation is nowadays slowing down the vitality of this building culture. Rural Bangladesh offers an interesting variety in traditional house types in terms of floor wall and roof (Table 8).

Element	Traditional House form Types	
<b>Floor</b>	<b>1.Single storied</b> (mostly common all over the Bangladesh) <b>2.Double storied</b>	 <p style="text-align: center;">Figure93: Single and double storied house form. Source: (Firoza Akter,2007)</p>
<b>Roof</b>		
Roof Shape	Single pitched (Ek Chala) Double-pitched gabled (Do Chala) Hipped (Char Chala) Double Hipped (At Chala) Semicircular type	
Roof Covering Type (Material)	Thatch House Tin House Tile House	
<b>Wall</b>	Mud house. Bamboo house. Ekra house (reeds or bamboo matting). Tin House.	 <p style="text-align: center;">Bamboo panel wall      Reed wall      Mud wall</p>

**Table 8: Traditional house of Bangladesh types in terms of floor, wall, and roof.**  
Source: (Table prepared by author and sketch from Hassan 1985.)

With all its variations, traditional houses are commonly recognized as ‘Mud house’, (irrespective of roof type), ‘Thatch house’, ‘Tin house’ or ‘Tile house’ and ‘Tribal house’. Another type of house is ‘Boat house’ which is built in boat and are inhabited by the nomadic people like ‘Bede’ (Table 9).

<p><b>Mud house</b></p> <p>Houses with mud walls are commonly known as ‘mud house’ irrespective of the structure and material of the roof. This type of houses is most common in the high flood free regions, especially in Barind and Madhapur tracts and in the eastern part of Bangladesh. The insulating effect of thick and cool walls keep the interior comfortable. Mud walls with a thatched roof is an ideal combination for keeping the interior cool.</p>		 
Roofing material	Thatch Clay Tile G-I sheet	
Wall	Solid mud type Wattle type with post inside the walls Sun-dried brick	
Floor	Single and double storied	
<p><b>Thatch house</b></p> <p>This is the basic traditional house for its extensive use all over rural Bangladesh. Various kind of thatched materials is in use for walls and roofs. Among them, gabled with the humped roof is typical of thatch house.</p>		 
Roofing material	Roof is framed by bamboo members and is covered by various kinds of thatch like jute sticks, rice straw, chhon, ulu, reed, bamboo matting and leaves (like gol pata, cocoanut leave or palm leaf, etc.)	
Wall	Jute sticks, reeds, various leaves (Gol pata, Coconut leaf, palm leaf, etc.), expensive and durable bamboo matting, all are wall covering panels used in conjunction with frame structures of the house.	
Floor	Single storied	




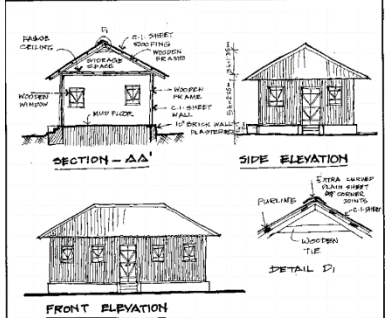

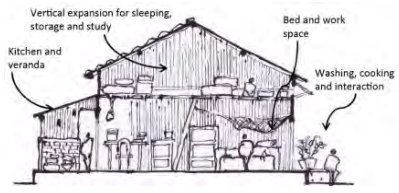

<b>Galvanized iron Sheet House/G. I Sheet House</b>		 
Roofing material	May be single pitched, double pitched gabled, hipped or double hipped. Covered by G.I sheets.	
Wall	Consists of timber frame or rectangular grid filled with plain or corrugated G.I sheet, wooden planks, door, and windows, etc.	
Floor	Some houses of this type are seen as double storied structure.	
<b>Tile House</b>		 
Roofing material	Tile as roof covering material.	
Wall	Walls structure may be any one of the mud houses, G.I sheet house or thatch house except the roof covering.	
Floor	Single storied	
<b>Tribal house</b>		
Roofing material	Mainly thatch house	
Wall	Jute sticks, reeds, various leaves (Gol pata, Coconut leaf, palm leaf, etc.), expensive and durable bamboo matting, all are wall covering panels used in conjunction with frame structures of the house.	
Floor	Houses are built on stilts ranging from .6m above the ground level to 6m high (Garo tribe) platform.	

Table 9: Types of traditional house of Bangladesh.

Source: (Table prepared by Author)

## Plinth and verandah

The plinths on which dwellings rest are high (Fig 94) so that structures are not flooded during the monsoon, or that snakes, frogs, or other undesirable creatures do not come inside at night. The front of each hut contains a full-length or partial verandah. To reach the door, one has to climb mud steps and cross it. At one side of the verandah is a bamboo platform supported by a mud mound or bamboo stilts. This provides a place for guests to sit, for family members to sleep on hot nights, or to store paddy or jute in heaps.



*Figure 94: showing plinth from the left made of mud, semi pucca*  
Source: (www. Google.com)

## Posts and walls

Rural architecture never contains unnecessary or unused spaces. Construction is simple, efficient and economical. It is not possible to create a low-cost structure using high-cost materials, even by reducing floor area. Bangladeshi village architecture is created using the most readily available building materials, and most elements are produced by the resident. Typically, wood or bamboo posts are inserted in the ground at a spacing of about three meters. To prevent decay, their ends are either burned or painted with bitumen. On top of the posts are placed triangular wooden or bamboo trusses. These trusses are joined by bamboo purlins of smaller section, and the whole structure is covered over by layers of straw. The pitched roof may have two, four, or even six. Sometimes mud walls are used instead of posts.

According to the capability of the householder, Walls can be of three types (Table 7). Firstly, they may be constructed of bamboo panels, jute sticks or other local reeds, secondly, they could be of compacted mud: in layers or in blocks; and thirdly the walls could be of corrugated iron sheets. The roof may also be of three materials; jute sticks, thatch or corrugated iron sheets. Most often, the wealth of the owner determines the material to be used. The huts are often single roomed, but partitions are not uncommon, although these are more for visual reasons than anything else. They are normally free-standing and do not reach the ceiling. People generally build their own houses with assistance from family members and the spontaneous help of friends and neighbors. Such walls are often very thick. In some cases, cow dung, chopped straw, or other materials is mixed with the earth to make the walls stronger. Sometimes the stabilized mud is formed into brick-like or square blocks, which can be laid up into a wall. In this process, after building to a certain height, the earth is allowed to dry for a day or two before construction continues. The roof truss with all its covering material is placed directly on top of a mud wall. To produce two-story structures, wooden or bamboo platforms may add. In some areas, an alternative to all-mud walls are thin strips of bamboo woven together, placed upright, and covered with mud-straw mixture.

## Interior

Inside the house, there is generally one large space that serves many purposes; there are few or no partition walls and no separate rooms. To one side the bed platform is raised high on bamboo posts, level with the window so that breezes will cool those sleeping there at night. Below it is stored onions, potatoes, chilies, and other small necessities. On the other side of the room is a high platform, on which are kept seeds prepared from the previous year for planting in the coming season. Sometimes there are also lines of earthen jars filled with molasses. Around the walls are bamboo shelves, and below these are hung such items as mirrors, combs, and lamps. There is also a small closet, a table, and a chair - perhaps of yellowish jackfruit wood. From diagonal bamboo bracing may hang a cane or reed swing. In its center may be a colorful paper flower or a rattle – something brought from the market for a young child. A sickle, a hookah, or perhaps an old colored picture may be tucked in on the exterior side of the woven bamboo walls, and leaning on another side may be two or three plows of Acacia timber. Sometimes the house may contain an extra, portable stove, perhaps in a broken pail, for use during winter or the monsoons. The stove is also used on special occasions, such as at birth or at a time of illness, when it is necessary to heat water or milk.

## Ornamentations

The finishing step in house building is to spread a mixture of mud and cow dung over the mud walls and floor. A rag or jute fiber is used to apply the mixture. It is dipped into the slush, and a distinct design of semicircular arches appears, made to the diameter of the human hand 3' Because of its fibrous properties, cow dung acts as a sealant that helps keep the premises clean. Sometimes borders are made around the doors and windows, and niches are used to keep lanterns and other household items. These borders and niches are decorated with flowers, birds, butterflies, and other designs using a white paste made from *atap* rice. Calligraphy also records poetry or thoughts from Bangla philosophy. Variety is sometimes achieved by adding red, brown and green colors, made from different kinds of earth and foliage. Into this traditional scene, corrugated iron sheets were the first intrusion of a foreign material They were introduced by English traders and were generally used to replace straw. Today they may be seen on the timber structure of the relatively well-off farmer. But straw and bamboo remain the main building materials of villages. The bridge across the canal is of bamboo; so are the goal posts on football fields. Schools, village and market shops, and all other types of structures are derived from the same architectural principles as the residential huts. Simplicity in materials and design, lack of pretension in presentation, horizontality in expression - these are the essential qualities.

In present context, the stilt house building technology has been historically validated, widely used in Bangladesh and southern part of Asia, and may be easily implemented in any other flood-prone areas. As an indigenous knowledge that has been verified by its application history of more than 1,000 years, the stilt house building technology is believed to be transferable to other regions in the world. It is easy to understand its theory and mechanism. The costs of monetary and time are low and less manpower is required. Such houses are raised on bamboo or timber stilts and have a floor made of split bamboo sections or timber planks (Fig.95). The use of RC posts as stilts is becoming common in areas with a tradition of stilted housing, substituting the typical timber and bamboo stilts. These have the advantage of being water-resistant and hence more durable. Stilted houses could serve as a basis for replication in other flood-prone area based on participatory consultation with local communities. Stilts houses generally built of bamboo, timber, thatch and RC posts. These materials are widely available in the hilly regions and within the range of the house builders.



**Figure 95: Transformation of traditional bamboo matting wall in the present context which is seen all over Maowa area, Dhaka**

Source: (By Author)



**Figure 96: Showing combination of the geometrical grid and pattern in painting representing the transformation of the historical essence of terracotta.**

Source: (By Author)

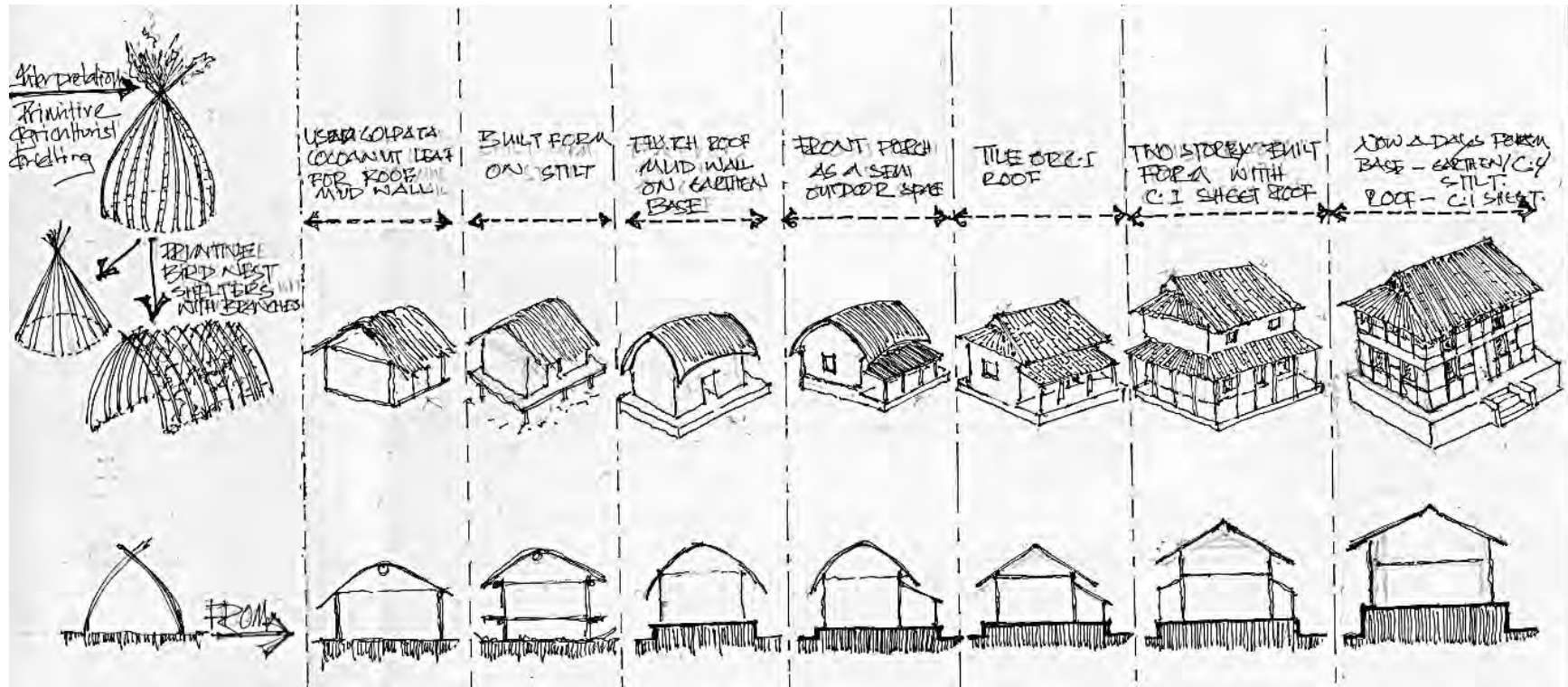


Figure 97: Showing vernacular form of Bengal which evolved from primitive period transformed into various form according to contextual material and social need.

Source: (Prepared by Author)

## **Chapter 05**

## **Identification of archetype**

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### **Content**

**5.1 Interpretation and Basic Typology**

**5.2 Discussion**

**5.3 Identification of Pattern.**

**5.4 Fusion and Transformation**

**5.5 Conclusion**

## 5.1 Interpretation of Basic typology

Everything in the world is the product of a respective historical process. In Vitruvius's opinion, the origin of architecture has started from this basic building. Under the advanced expertise of the men, the basic shelter transforms into "dwelling house". Vitruvius illustrates and originates these houses from tribes where they had been shaped in conjunction with environmental conditions and materials provided from nature.

He describes them as follows: That houses [...], we can see for ourselves from the buildings that are to this day constructed of like materials by foreign tribes [...], roofed with oak shingles or thatched. Among [one of those tribes], [...], they lay down entire trees flat on the ground to the right and the left, leaving between them a space to suit the length of the trees, and then place above these another pair of trees, resting on the ends of the former and at right angles with them. These four trees enclose the space for the dwelling. Then upon these, they place sticks of timber, one after the other on the four sides, crossing each other at the angles, and so, proceeding with their walls of trees laid perpendicularly above the lowest, they build up high towers. The interstices, which are left on account of the thickness of the building material, are stopped up with chips and mud. As for the roofs, by cutting away the ends of the crossbeams and making them converge gradually as they lay them across, they bring them up to the top from the four sides in the shape of a pyramid. They cover it with leaves and mud and thus construct the roofs of their towers in a rude form of the 'tortoise' style (Vitruvius, 1960: 39-40).



*Figure 98: Two woodcuts from Vitruvius Teutsch illustrating Vitruvius's narrative of dwelling.*  
Source: (Vitruvius, 1960)

From the quotation above, it can be understood that Vitruvius regarded early beginnings of dwellings as having been shaped by natural forces and inherited materials. The dwelling of Bengal delta is quite different as early men made progress in construction; their expertise resulted in advanced buildings. He interprets human reasoning as an agency which has helped men to advance on constructing. As stated by Stephen Frith (2004: 39), Vitruvius's story regarding the origins of the dwelling has started a long-lasting debate on the re-creation of architectural origins. Through his narrative, the dwelling-house becomes a symbol of the origin of architecture; for this reason, the construction of the first shelter has been illustrated repetitively in the translations or different editions of the *De Architecture* (Fig.98). This symbol can be interpreted as an allegory of Vitruvius's idea concerning his architectural beauty which has been constructed on social discourse and is intensified with the architectural orders.

The art and architecture of the land was, therefore, essentially an expression of an agricultural society who eked out their living from the soil, which profoundly influenced their creations. The

rural folk which included a large section of masons, craftsmen, and painters, lived a simple life and dwelt in unpretentious mud, bamboo or thatched huts, which in the course of time have completely disappeared. Features like verandahs, courts, and terraces are all a part of the region's architectural history. The households of the Delta are nothing but courtyard developments that possess a sense of history and place. The deltaic courtyard interconnects multiple forms and functions instead of being located in the middle of a single structure.

Beside geoclimatic influence, the delta went through the phase of early monumental architecture (Stupas, Temples, and Monasteries, basically was brick architecture). The Garbhagriha, literally "womb house", a small chamber, square in plan. The temple at Sanchi is a remarkable example of this type. As one can see the basic idea was only a traditional concept of the 'house' or 'pavilion structure' of the traditional rural area in Bengal.

Travel accounts from around that period mention that the landscape was studded with stupas and temples, the remains of some of which now extend from Paharpur in the north of Mainamati in the south-east. This early monumental architecture marks a moment of conscious creation, pointing to the transition from an unselfconscious architecture – the domain of traditional, vernacular practice – to a more metaphoric and symbolic construction. It is a unique combination of the vihara and temple, consisting of a vast courtyard, nearly a thousand feet wide, with votive stupas, minor chapels, the water tank, and other structures. As one can see the basic idea was only an enlargement of the traditional concept of the 'house around a courtyard' harking back to the traditional rural house form (Fig 99).

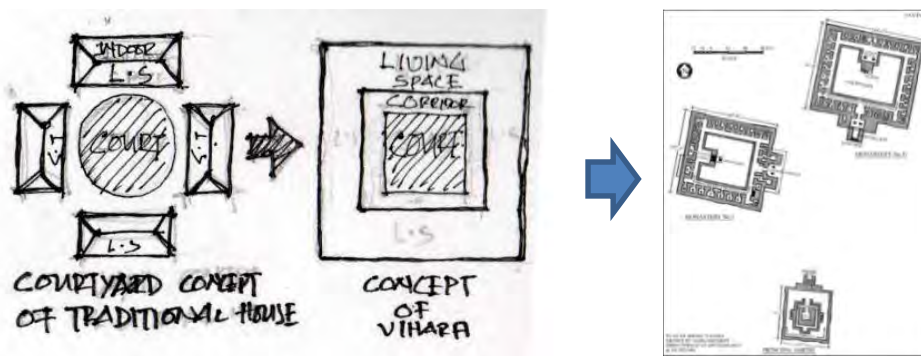


Figure 99: 'House around a courtyard' the traditional rural house form.  
Source: (Prepared By author)

Islam came into this delta with horizontal and pavilion architectural features (like- mosques, pavilions, etc.). Vernacular architecture in Bengal had far-reaching effects on the development of the indigenous formal architecture. The Bengal mosque retained its original unpretentiousness in its subsequent developments. It was a single-roomed structure, had a curved cornice and *Chala* roof. It could not, in the process, overcome the tremendous power of Islamic symbolization. So, domes, as an Islamic motif, appeared. However, in keeping with the local flavor of submission to nature, these domes were never overpowering. Instead, they were restrained and subdued, in accordance with the general tone of the architecture. The requirements of accommodating a dome slightly modified the plans, however, and so they became either square or derivatives of squares.





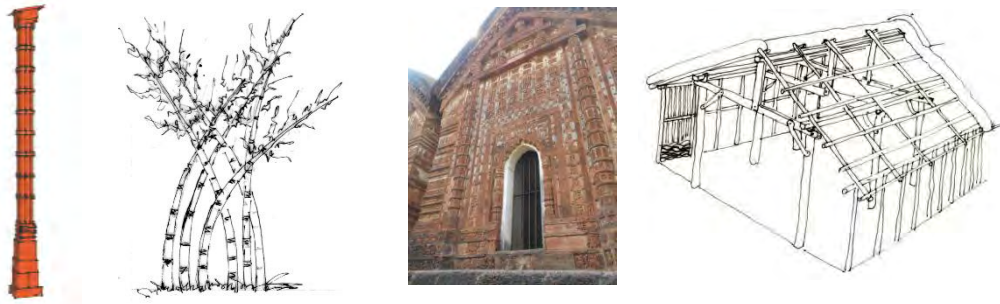
**Figure 100: Probable process of evolution of facade having a curving cornice**

Source: (Guha,2017)

These geometrical forms in plan were expressed on the roof in the form of one or more domes. Whenever opportunities presented themselves, as in the case of an elongated bay or the rectangular verandah, the Bengal roof made its appearance. It must be mentioned here, that the Bengali Chala-roof does not need pendentives, squinches or such intermediate elements. Since its base is square, it can rest directly on the supports. Thus, its direct construction added to its appeal. Thus, domed brick structures incorporating curved cornices was derived from the village hut. Bangla vaults reproduced the roofing system and plans included chambers with open porches in imitation of village huts with verandahs.

This mode of the building also superior to what may be termed vernacular architecture never rose to classical heights, but it possesses a freshness and spontaneity and makes an appeal as it is a reflection of certain local characteristics. The population being largely rural there are no outstanding monuments in this mode, but there are a number of temples of moderate proportions most of which display formations common to all. These temples are designed on the principle of the main structure, square in plan, its walls vertical, but the lines and planes which in most buildings are ordinarily horizontal, in this type are carried across its front in a series of parallel curves specially affects the form of the roof and its cornice or eave, which, in contour, are parabolic, and clearly inherited from a bamboo framework given this shape in order to throw off heavy monsoon rain. Huts with thatched roofs built on similar lines are common in most parts of Bengal, and the somewhat indeterminate curved effect of the upper portions conveys the impression of a people bending before the elements, of yielding to them rather than defying them in view of their relentless power. As an instance of the persistence of this tradition in the building art of Bengal, the principle of the curve is reproduced in modern roofs of corrugated iron, a material which, in spite of its intractable nature, is forced to follow the shape of the bent bamboo.

The temples may be classified into three types, *Chala*, (Hut shaped), *Ratna* (Pinnacle shaped) and *Shikhara*. Among them, "... the *Chala* type which is the imitation of the residential thatched huts of the people of Bengal, is by far the most popular type of temple. "Further influences of the *Chala* can be seen in the other two types. Even though the traditional one, the *Shikhara* type, also existed in Bengal, the *Chala* type commanded more popularity. Hence, even the *Shikhara* type became modified to such an extent that it only retained its bare essentials.



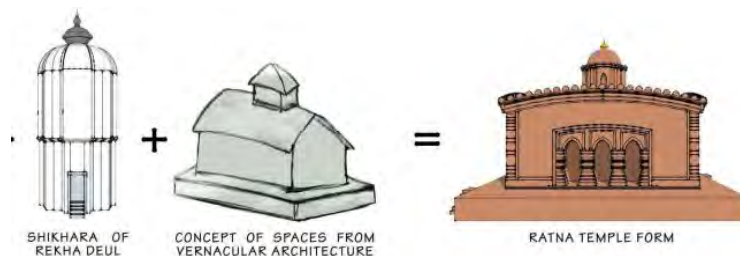
**Figure 101: vertical projection on the Temples(left) is similar to the bamboo pole (second from the left). vertical and horizontal projections on the facade of the Jor Bangla temple (second from the right) are replica of wooden posts and beams of vernacular architecture.**

Source: (Guha,2017.)

The vertical projections seen on the facades of the Terracotta Temples are long, slender engaged pilasters with horizontal moldings at regular intervals on the vertical post. These are similar to the repetition of internodes on a bamboo pole – used as supporting members in the huts. It can now be justified that the horizontal and vertical projections on the eastern and western walls of the Jor Bangla Temple are the replica of principle tie-beams, rafters and bamboo posts of Bengal huts (Fig-101). This feature can thus be regarded as replication of wooden construction technique on terracotta bricks.

Rectangular walls with upper curved cornice, richly ornamented with terracotta plaques and vertical longitudinal projections with horizontal moldings at certain intervals – is the common front facade feature of the Terracotta Temples. Application of curved cornice to drain out rain water from the roofs quickly was seen in vernacular architecture and was later adopted in Islamic buildings that came up after 1400 A.D. and further got implemented on the cornices of the Terracotta Temples.

The form of the superstructure for the Chala temples was derived from the typical Bengal huts with thatched sloping roofs. The roof form played the crucial factor for determining the form of the superstructure. Otherwise, without the roof, every temple would have looked similar. The Ratna Temples represented newly evolved architectural forms among the Terracotta Temples whose significant characteristic is the addition of an upper pavilion above the main shrine.



**Figure 102: Probable process of evolution of Superstructure**

Source: (Guha,2017.)

The colonial Bungalow is the relations of dependence and reinscription between architecture and anthropology. The bungalow is a reconfiguration of the deltaic hut. True Bungalows (say the purists) represent structural simplicity, efficient use of space, and understated style. Bungalow epitomized the idea of dwelling in nature under the assured shelter of a big roof from where one could look out into the distant horizon. Various type of tectonics was employed for the Bungalow but always derived from lessons learned from the climate and local idioms. But in the colonial

ideology of racial segregation, it came to encourage spatial distancing and separation. It soon transplanted into an architectural style all across the subcontinent and all over the world.

In post-colonial architecture, a remarkable expression of formal composition in courtyards, the Bangladesh Academy of Rural Development<sup>1</sup> in Comilla and the Teachers-students complex of Dhaka University recall the introverted character so common in the vernacular. The setting created is one of tranquility and serenity. Although the elements are there, the architect did not take their interdependency into consideration, something very important to a sense of architectural identity in Bangladesh. The structures and courtyards are unintegrated and remain as two entities without cohesion. Flowers in the courtyard and a grassy character take away the symbolism of 'white purity', which would have existed in the rural courtyard. The relative failure of this endeavor perhaps emphasizes the fact that relationships of form and space in Bangladesh have more profound meaning than merely visual effects.

In this section, the origin of vernacular architectural form of Bengal identifies through a historical interpretation (Table 10 to table 16) which is already discussed in chapter 03. It began with 'primitive hut' from the pre-historic time. Stupa, monasteries, mosque, temple are then dealt with to highlight the architectural priorities of the people and their architecture. In the prehistoric period Man knew how to build shelters, they made use of the natural environment to provide them with shelter. The earliest forms of shelter were those in trees, where it would provide minimal protection against the searing heat of the sun and the cold of the rain. Also, trees protected Man against animals that could not climb up the trees. Man, slowly learned to make simple tools that would allow them to build better structures, and later on these structures gradually evolved in shape and form. Eventually, earth was taken from the ground and dried in the sun to form clay blocks, leading to the usage of bricks as the basic building block of shelters. These traditional houses are historically connected, have a strong sense of social equity and local placemaking. The tables (10-16) are self-explanatory, showing the evolution of the architectural form of Bengal from a single basic typology.

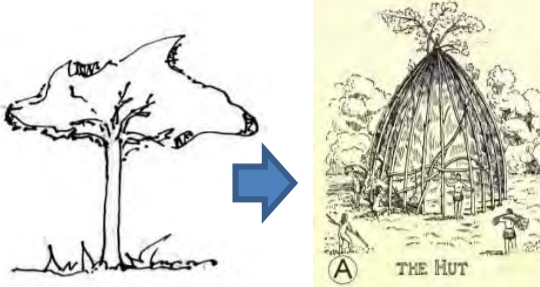


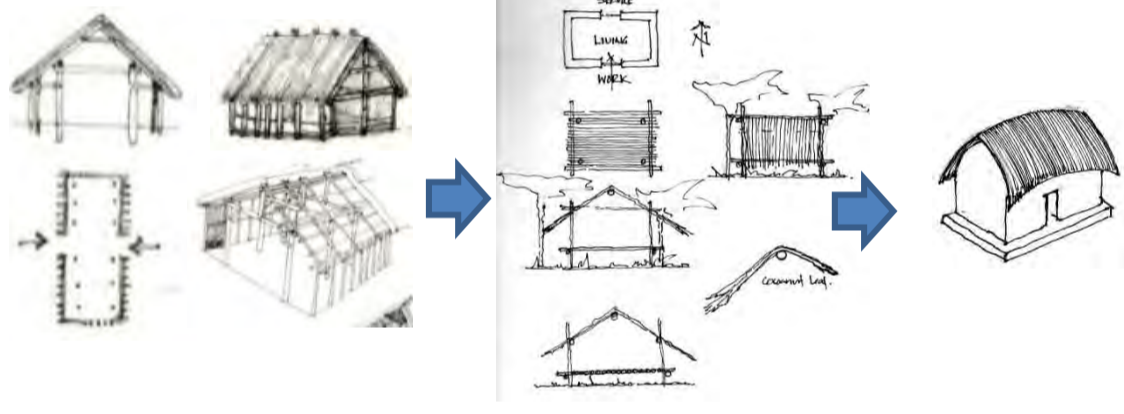
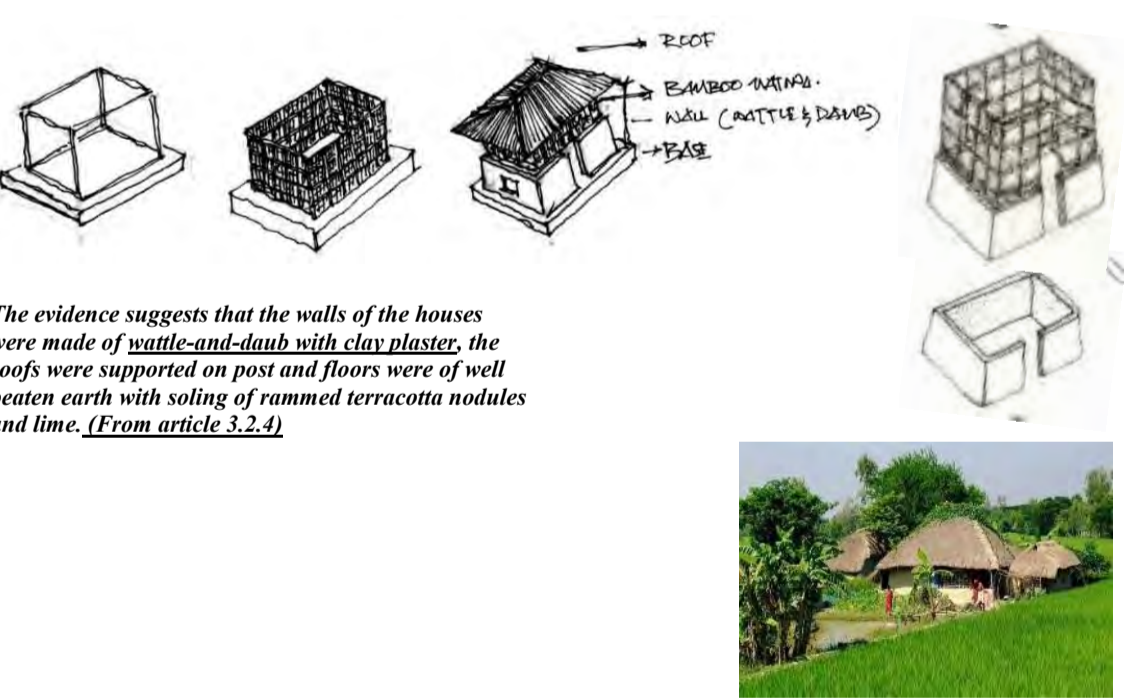
EVOLVING PRE/PROTO-HISTORIC INFLUENCE IN THE VERNACULAR ARCHITECTURALFORM			
<p>The earliest forms of shelter were those in trees, where <i>it would provide minimal protection against the searing source: heat of the sun and the cold of the rain.</i></p>			<p>prehistoric agriculturist shelter  <i>Fletcher,1905</i>  <i>the 'Hut' type resembles Bengal context on a raised ground. For the agriculturist formed of Branches of trees and covered with turf.</i></p>
Period	House Type	Material	Architectural Form
PRE-HISTORIC	<p><b>PALEOLITHIC</b>                      (Lower, Middle and Upper) (before 200,000-10,000 years) ago</p>	<p>Temporary shelters.                      Branches of trees and covered with turf.</p>	 <p><i>Temporary shelters of the Paleolithic people who lived mostly along the riverbanks. A single apace under a HUT shape structure. (From article 3.2.1)</i></p>
	<p><b>MESOLITHIC</b>                      CIRCA 4<sup>th</sup> Millennium B.C</p>	<p>Circular huts for shelter.                      Locally available raw materials i.e. Mud, Straw, bamboo etc.</p>	 <p><i>Mesolithic people were capable of erecting 'wattle-and-daub hut' (circular hut) for shelter. (From article 3.2.2)</i></p>
	<p><b>NEOLITHIC</b>                      Between CIRCA 3<sup>rd</sup> Millennium B.C And 3<sup>rd</sup> Century B.C.</p>	<p>Permanent huts, Agricultural homesteads                      Locally available raw materials i.e. Mud, Straw, Bamboo, Coconut leaves etc.</p>	 <p>The types of houses built by primitive peoples differ widely, being completely dependent upon the type of the "cutting tool" which the people possess and own the type of "landscape" in which they live. (From article 3.2.3)</p>
PROTO-HISTORIC	<p><b>CHALCOLITHIC</b>                      Between CIRCA Mid 2<sup>nd</sup> Millennium B.C And the later half of the 1st Millennium B.C</p> <p>They lived in modest <b>circular to square huts with mud-plastered walls. There were hearths and garbage-places in the huts.</b></p>	<p>People living in this site-built houses with reeds, mud, pellets of laterite and terracotta tiles. Structural evidence comes from Mahisdal, Bahiri, Hatikara, Bharatpur, Pandu Rajar Dhibi, Mangalkot, Dihar, And Tulshipur.</p>	 <p><i>The evidence suggests that the walls of the houses were made of wattle-and-daub with clay plaster, the roofs were supported on post and floors were of well beaten earth with soling of rammed terracotta nodules and lime. (From article 3.2.4)</i></p>

Table 10: Evolving pre/proto-historic interpretation  
 Source:(prepared by Author)



EVOLVING EARLY HISTORIC INFLUENCE IN THE VERNACULAR ARCHITECTURAL FORM			
<p><b>EARLY BEGINNINGS :</b> <i>The land of Bengal derived from the siltation of mud and other riverine minerals, and became the largest land of delta in the world. A big clue always comes to the reference of the History of Ancient Indian civilization-is the Mohenjo-Daro and Harappa (Indus civilization). Yes, Bengal was commercially and geographically connected with the Indus civilization. Original inhabitants of Bengal were believed to be proto Australoid Dravidians. Indus valley civilization people were also Dravidians but the context was totally different. Gradually a small group of Aryans pushed into the Bengal basin</i></p>			
Period	House Type	Material	Architectural Form
MAURYAN (3 <sup>rd</sup> -century B.C.E - 4 <sup>th</sup> -century C.E)	<p><b><u>Chandraketugarh:</u></b>  Mundane structures.</p>	<p>Early-Historic settlements of Bengal were situated in the red mud of the Pleistocene age (Varendra and Madhupur). It is speculated that mud walls had been widely used in the common houses after people started developing permanent settlements from the Neolithic age to the preindustrial revolution period. Straw, leaves, etc. were used to make the roofs of the houses.</p>	<p><i>Early terracotta of Bengal as a primary source to understand the early architecture of Bengal. A two-tier pavilion with a curved roof in the thatched style which has sameness with <u>typical Bangla Cha</u> and also resemblance with <u>temple architecture of Bengal.</u> (From article 3.3.1).</i></p> 
	<p><b><u>Mahasthan Garh</u></b>  Mundane structures.</p>	<p>Mud walls, probably tile roofing and clay floor</p>	 <p><i><b><u>Image of a Mud house with Tile roof.</u></b> The people of Bengal made good use of the sticky component of red earth when it is wet, which helps easy binding for walls. The sticky stuff becomes very stiff once it dries up. (From article 3.3.1)</i></p>

Table 11: Early Historic influenced architectural form through interpretation

Source:(prepared by Author)


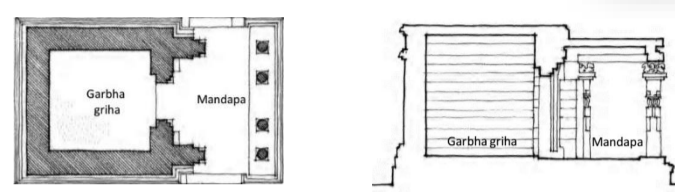
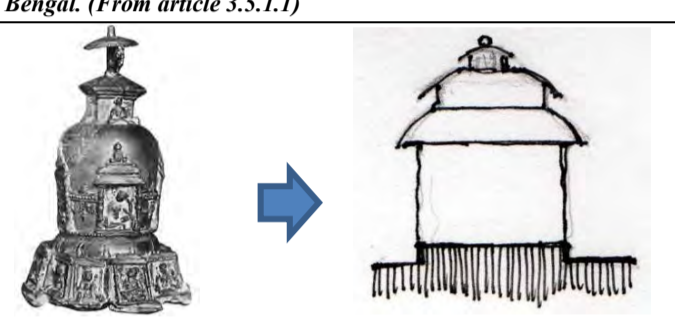
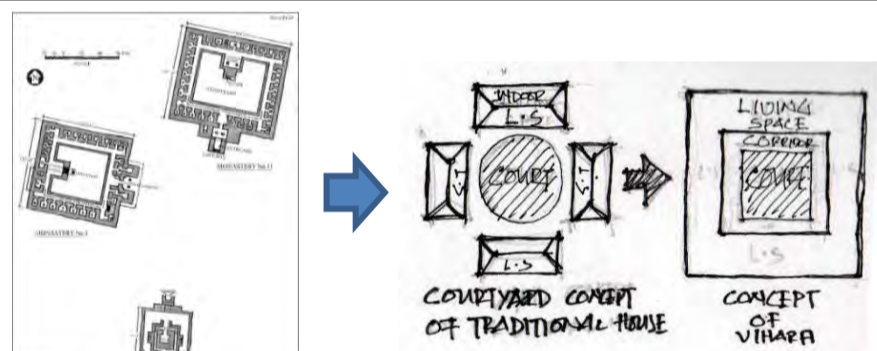

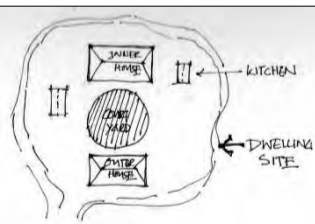
EVOLVING HISTORIC PERIOD INFLUENCE IN THE VERNACULAR ARCHITECTURAL FORM			
<p><b>THE ARYANS</b>  <i>The early Aryan village was a conglomerate of timber and thatch huts of different types. The most elementary of the huts was circular in plan, this being the simplest to construct with bamboo and thatch. The wall was made of upright bamboos tied together with twisted twigs. The roof made with bent bamboo took a domical or conical shape, made watertight with overlapping thatch or grass.</i></p> 			
Period	House Type	Material	Form
<p><b>GUPTA</b>                      (4th Century CE- Middle of the 6<sup>th</sup> Century CE)                      the <i>Brahmanas</i> started to come from North India to Bengal in groups to settle here and their dominance was established in the society by the patronage of ruling dynasties and wealthy people.</p>	<p><b>religious structure: Brahmanical Temple</b>                      The residential area and the areas related to religious activities were separate from each other.</p>	<p>Using bricks for architecture began during the Gupta period.</p>	 <p><i>The Garbhagriha, literally “womb house”, a small chamber, square in plan. The temple at Sanchi is a remarkable example of this type. As one can see the basic idea was only a traditional concept of the ‘house’ or ‘pavilion structure’ of the traditional rural area in Bengal. (From article 3.5.1.1)</i></p>
<p><b>PALA</b>                      (c. 750-1160 CE)                      The rulers of the Pala period were Buddhists and believers of Buddhist ideas and Buddhist philosophy was materialized with the establishment of numerous stupas, temples, and monasteries.</p>	<p><b>Stupa</b></p>	<p>Using bricks for architecture</p>	 <p><i>The 7<sup>th</sup>-century bronze votive stupa found at Ashrafpur in Dhaka can be considered as a fairly accurate resemblance of the stupa. It clearly represents a Chau-chala roof. (From article 3.5.2.1)</i></p>
	<p><b>Monastery or Vihara</b></p>		 <p><i>It is a unique combination of the vihara and temple, consisting of a vast courtyard, nearly a thousand feet wide, with votive stupas, minor chapels, the water tank, and other structures. As one can see the basic idea was only an enlargement of the traditional concept of the ‘house around a courtyard’ harking back to the traditional rural house form.</i></p>
	<p><b>Buddhist painting illustration</b>                      Such huts, with certain variations in roofs and supports, continue well into later centuries. A number of motifs encountered in the Baroda and Rajshahi manuscripts.</p>		 <p><i>Image of a shrine (drawn after an 11<sup>th</sup>-century manuscript illustration)</i></p>
<p><b>SENA</b>                      (c.1098-1204 CE)                      Towards the end of the Pala, rule began the Brahmanical control of the society in Bengal. This control was firmly established and consolidated during the Sena period. The Sena kings came to the throne after the Pala reign collapsed in the second half of the 11th century. As the Brahmin rituals and traditions flourished during the Sena reign, the construction of temples covered more extensive period.</p>	<p><b>Inscriptional Evidence</b>                      Traditional Homesteading pattern</p> <p><b>Literary Evidence</b>                      Traditional Homestead element</p>	<p>Using bricks for architecture</p>	<p>1. Dwelling sites (<i>bati</i>), outside house (<i>varagrha</i>), houses (<i>grha</i>), kitchens (<i>pakaditegrha</i>), cowshed (<i>gograh</i>).  <i>Bhatera copper-plate inscription of Raja Govinda-Kesavadeva c. 1149 CE. Bhatera, District Maulvi Bazar, Bangladesh. Sanskrit. Reference: Kamalakant Gupta, pp. 164 ff (Islam,20017)</i></p>  <p>2. <i>Saduktikarnamrtam</i>  <b>Secular Buildings</b>  <i>A roof pallion screened by mats against rain (attesu kandapatavaritasikara). (V. 2188).</i>  <i>Grass hut (trnakutira). (V. 1336).</i>  <i>The peasant houses (halikagrha). (V. 13337).</i>  <i>Houses of the rich (dhanyanam bhavana). (V. 1178).</i>  <i>Bridal chamber (basa bhavana). (V. 516).</i>  <i>Center of the house- front hall- courtyard. (V. 736).</i>  <i>White washed house. (V. 765).</i>  <i>The courtyard (prangana). (V. 741).</i>  <i>House door (grhadvaram). (V. 776).</i>  <i>City’s archway (pura taurana). (V. 362).</i>  <i>City (nagara). (V. 1593).</i>  <i>Description of a poor man’s house consisting of wood poles, mud walls, and roof of thatch (trna). (V. 2246). (Islam,20017)</i></p>

Table 12: Influence of Gupta, Pala and Sena period architectural form through interpretation  
 Source:(prepared by Author)



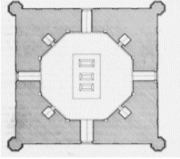
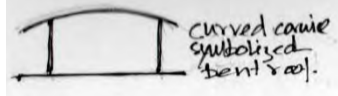

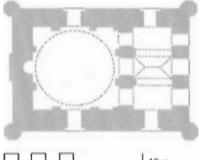
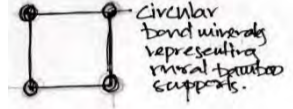

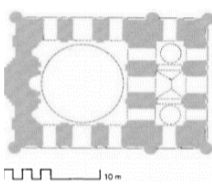
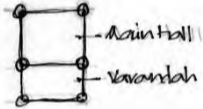
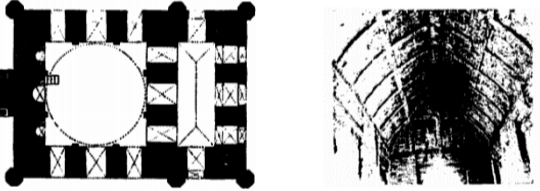

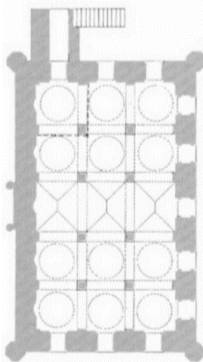
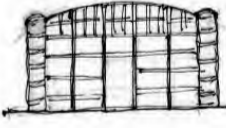

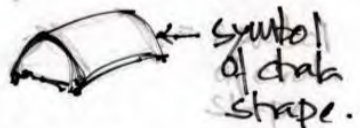
CENTRAL ASIAN INFLUENCE IN THE VERNACULAR ARCHITECTURAL FORM			
Period	House Type	Material	Form
<p><b>DELHI SULTANATE (1204-1526)</b> The conquering Muslims of the thirteenth century already possessed a highly developed architecture of their own. By then, certain elements, such as the arch, dome, minaret, mihrab, etc., had been recognized as fundamental features of Islamic architecture.</p>	<p>The introduction of new building types- mosque. Mazar and madrasa- and of renewed building techniques- the arch and the dome- generally characterizes Sultani architecture.</p>	<p>Local materials (brick and terracotta)</p>	<p><i>A glimpse of sultanate houses can be found in the Iskandar Nama of Nusrat Shah of Bengal. In a miniature painting of "Alexander Receiving Dara's Daughter Roshanak" (Fig: 4), the setting is a house, and what must have been a most luxurious one. The king is seated in a square chamber of the house, which has a triangular roofed pavilion(chala) on the upper level. (From article 3.6.1.1)</i></p>     <p><i>curved cornice symbolized rural bent roof</i></p>    <p><i>circular bent minarets representing rural bamboo supports</i></p>    <p><i>The layout represents a traditional homesteading pattern</i></p> <p><i>Eklakhi Tomb (1425), b. Chamkatti Mosque (1475), c. Lottan Mosque (late 15<sup>th</sup> early 16<sup>th</sup>)</i></p>  <p><i>Masjid bari mosque plan and interior view (Rural bamboo framework)</i></p>    <p><i>Bamboo wall adopted to produce the combination of the geometric grid and pattern in terracotta.</i></p> <p><i>Choto Shona mosque in Rajshahi (1493-1519)</i></p>   <p><i>The tomb in Fath Khan in Gaur (Symbol of traditional Chala shape)</i></p>

Table 13: Sultanate influence in the vernacular architectural form through interpretation  
Source:(prepared by Author)

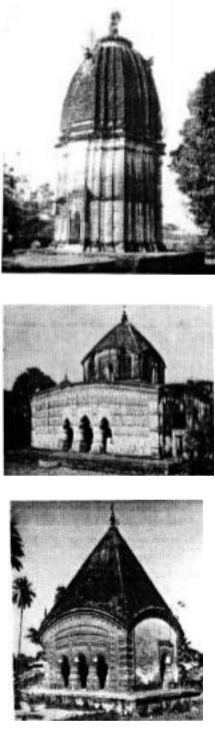
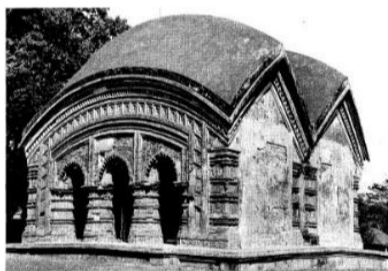


CENTRAL ASIAN INFLUENCE IN THE VERNACULAR ARCHITECTURAL FORM			
Period	House Type	Material	Form
<p><b>MUGHAL and NAWABI EMPIRE (1610-1757)</b></p> <p>Mughal Rule was consolidated all over Bengal, making it the Eastern edge of an Empire. The Mughals concentrated more on establishing an efficient imperial administrative system with their advent in 1596 AD. <b>During the long and fairly peaceful Mughal rule, both Muslim and Hindu enjoyed a considerable degree of freedom</b></p>	<p><b>Mosque</b></p>	<p>The Mughals concentrated more on establishing an efficient imperial administrative system. They wanted to add a <i>New Architecture Order</i> – New Sense of Sophistication. Rich Surface <b>Decoration with Terracotta Tiles</b> was at times, Replaced by <b>Plastered Panels</b>.</p>	<p>(From article 3.6.2) The Bengali style was recognized by the whole nation.</p> <p><i>Marble canopy on the emperor's throne, Delhi.</i></p> <p><i>Shah Burj kiosk, Delhi Emperor's audience pavilion, Lahore, (the naulakha)</i></p> <p><i>(left)emperor's audience pavilion, Agra, (Right) The Moti Masjid</i></p> <p><i>Tomb complex of Khawaja Anwar-i-shahid (late 17<sup>th</sup> century), The mosque tomb of haji Khawaja Shabazz, (1679)</i></p> <p><i>The mosque of Kartalab khan (1700).</i></p>
	<p><b>Temple</b></p>  <p><i>Different type of Hindu temples: a. Shikhara Type b. Ratna Type c. chala type.</i></p>	<p><u>The main features of the popular Bangla style are a square sanctum, often more than one story, with a pronounced curvilinear elevation. The plan may be either on an elongated base with only two sloping roofs above or on a square base with four pitched roofs. A singular hut of this type is known as Ek Bangla while the two together are known as Jor Bangla.</u></p>  <p><i>Gopinath temple at Pabna (jor Bangla)</i></p>  <p><i>At-Chala temple</i></p>  <p><i>Pancha-Ratna Govinda Temple, Puthia (17<sup>th</sup> century)</i></p> <p><i>Pancha Ratna Govinda Temple, Puthia (17<sup>th</sup> century)</i></p>	

Table 14: Mughal & Nawabi influence in the vernacular architectural form through interpretation  
Source: (prepared by Author)











EUROPEAN and MODERN INFLUENCE IN THE VERNACULAR ARCHITECTURAL FORM			
Period	House Type	Material	Form
<p><b>EAST INDIA COMPANY (BRITISH COLONIAL RULE) (1757-1947)</b></p> <p>The period of the late 18th. Century was when it was the decline of Mughal Power and the advent or arrival of the Europeans. This was also the beginning of the British Colonialism in the Indo Pak Sub-Continent. With the imported concept of habitat and lifestyle, these 200 year-long eras of imperialism, furnished the complete overhaul of the social, cultural, and urban system.</p>	<p><b><u>“Bungalow” as a reconfiguration of the deltaic “hut”.</u></b></p>	<p>Whitewashed finished with tile roof</p>	<p><b><u>Bungalow (From article 3.7.1)</u></b>  <b><u>comes from Bangla and Bangla, words which mean, literally, “in the Bengal style (of a house).” In its original use bungalow referred specifically to a lightly-built single-story house, usually with a thatched roof, found in the Far East. --- Merriam Webster Dictionary</u></b></p>  <p><i>First Bungalow in British India 1790 (Residential house)</i></p>  <p><i>Early colonial Bungalow</i></p>   <p>A wooden bungalow which serves as Momin Mosque since 1920</p> 

Table 15: Colonial influence in the vernacular architectural form through interpretation

Source:(prepared by Author)

EVOLVING CONTEMPORARY ADAPTATION			
Period	House Type	Material	Form
<p><b>CONTEMPORARY (1947-1971)</b></p> <p>The period between 1947-1971 can be seen to be the period in which the nation, emerging from the shackles of a 200-year old Colonial domination, takes on the task of nation-building. Indeed, this is the period of post-Colonial nation-building in the Indian Sub-Continent.</p>	<p><u>Implementation of International Style and the Evolution of 'Bengali Style of Architecture'</u></p>	<p>Brick, RCC</p>	<div style="display: flex; flex-direction: column; align-items: center;">  <p><i>TSC of Dhaka University</i></p>  <p><i>The Bangladesh Academy of Rural Development1 in Comilla.</i></p>  <p><i>Boys Hostel, BUET</i></p> </div>

*Table 16: post-colonial adaptation to vernacular architectural form through interpretation*

Source:(prepared by Author)

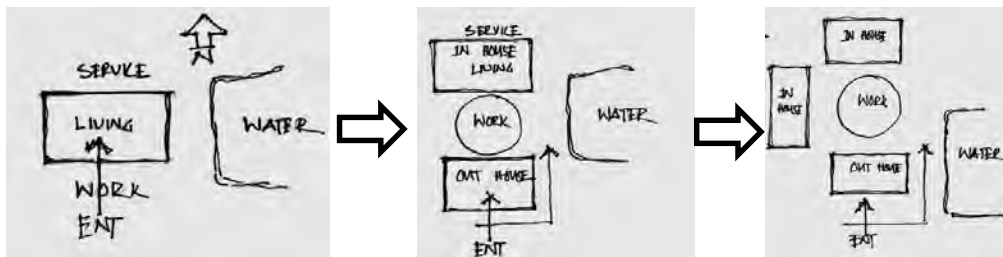
## 5.2 Discussion

The architecture of this sub-continent is a conglomeration of different periods having their Imprints on all visual elements if we trace 'the history from the Vedic period we will observe the foreign influence in the evolving architecture. The Arians were the first foreigners to be massively involved and ultimately settling in this region. Architectural features like Gopuram. Thaba. Shunchi by Aryan builders were significant contributions, With the arrival of Alexander [250 B, C] the Great in the northwestern part, the area came under the rule of Greek rulers and a strong western Influence of a very matured Classical civilization appeared in India. In 1200 AD with the arrivals of Muslims from the Persian territories and after the Mughals assumed power, architecture of this subcontinent was further enriched with the association of local and foreign features, The Mughals who settled in this region started to shape an architecture blending with local context, thus providing a rich flavor to our architectural heritage. Architectural features like a dome, kiosk, and planning concepts for formally and axially of Persian origin was Introduced, the colonial Influence of the two hundred years of British rule is also dominating, the foreign Influence in determining the architectural scenario of this sub-continent. Except the British, others settled down and their source of architecture blended with locals, adjusting to our social and climatic context over a period of time, even after the British colonial period the architecture of this subcontinent was shaped by some foreign architects, due to the internationalization. However, in spite of external influences, the local core character persisted to date.

From a consideration of all the examples so far provided, the most significant common fact that one discovers is the use of simple, rectangular and free-standing structures. In rural areas, this is quite vividly apparent. Verified by the monuments, the separateness of the huts seems to be the most marked theme. As Francis Buchanan said in 1810, "... and there is no contrivance by which a person can go from one apartment to the other without being exposed to the sun and rain". The huts usually open out to the outside through their wider facade and hence they are organized in a transverse fashion. Thus, a sense of exterior space is created. These facades, though small, are rich in texture, and are made either of mud or of bamboo. On top, each is qualified by projecting eaves, most commonly curved, and at the bottom by an extended plinth. Windows do not contest the closed effect. In some cases, although a sense of transparency is created by the bamboo matting, the overall closed effect is not hampered. Sometimes though, a verandah modulates between the vertical plane of the hut and the horizontal one of the courtyards in front of it.

From the examples which are cited in chapter 3 and chapter 4, the first aspect one immediately notices is the creation of a platform or plinth on which simple structures are constructed with the attempt of creating various formal and compositional relationships. Each rectangular structure is associated with it an implied open space in front. The relationship between the two is cemented by the transverse entrance from the space through the center of the longer facade. In formal terms, when such is the function of the structure, the center of the facade is usually emphasized by a centralized arrangement in elevation which produces further accentuation of the axis. This can also be seen in the monumental architecture of Bangladesh. Coupling this fact with the layout patterns of the rural houses, it is reasonable to suppose that each structure originally exists with its own, defined exterior space. Reference to a nearby water body and thick vegetation is an integral part of the setting.

A yard is produced in front of each hut. In the case of subsidiary huts, they share the courtyards of the first building. The facades of the huts act as a backdrop to the space of the courtyard while also modulating and creating a character for it. It would be an appropriate time now to draw attention to the subdivision operations of a rural *Bari*. Each hut has always had its own definite outdoor area. This is also a part of the *vita* and is seen in all the examples cited in chapter 4. The courtyards are further characterized by being plain, without vegetation and being very well kept. Regular application of mud slurry gives to them a sense of a clean and pure appearance. This importance of the courtyard is evidenced by the fact that when a mound is prepared for a house, it is always made big enough to include the *uthan* space in front of it (Fig 103). The whole selling is surrounded by a thick layer of vegetation and raised from the surrounding flood plain.



**Figure 103:** A yard is produced in front of each hut. In the case of subsidiary huts, they share the courtyards of the first building.

Source: (Prepared By author)

It is evidently the outcome of ingenious but practical minds. The land being essentially deltaic and riverine, a rich deposit of alluvium is readily available for the manufacture of brick or growth of timber. This cheap but excellent material logically encouraged the development of terracotta art, which, in its variety and richness, can hardly be equaled by any other country in the south Asian sub-continent. For the moment it would suffice to state the assumption that the hut and the yard space in front of it, in tandem, constitutes the special spatial identity of Bengal architecture. This is universally seen in both domestic and monumental schemes. The individuality of the structure, persistence of the yard, a marked axially and equal importance of space and form as represented by the vertical and horizontal planes of the facade and courtyard. Gradually, the original idea of the pavilion was manifested in three primary forms.

- The Bamboo-woven walled huts on stilts
- Thatch covered huts on an earth platform
- The use of brick or permanent structures.



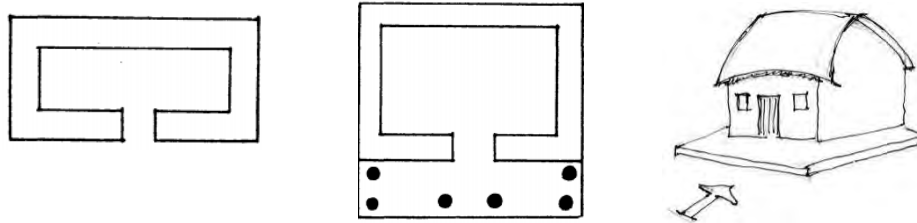
**Figure 104:** a. The Bamboo-woven hut on stilts.  
b. Thatch hut on an earth platform  
c. Use of Brick in Delta, “Jorbangla Mosque.”

*The influence of Delta was quite extraordinary, leading to temples shaped as “Bengal Huts.”  
These types of regional interpretations are unique architectural features.*

Source: (Prepared by Author)

### 5.3 Identification of pattern

The form of the huts grows from a clear and uncomplicated rectangular plan. In most cases, the plinth is made out of beaten earth, a sort of individual platform on the collective mound. On this, the walls are constructed in such a manner that the boundary of the platform remains exposed in the shape of an extension.



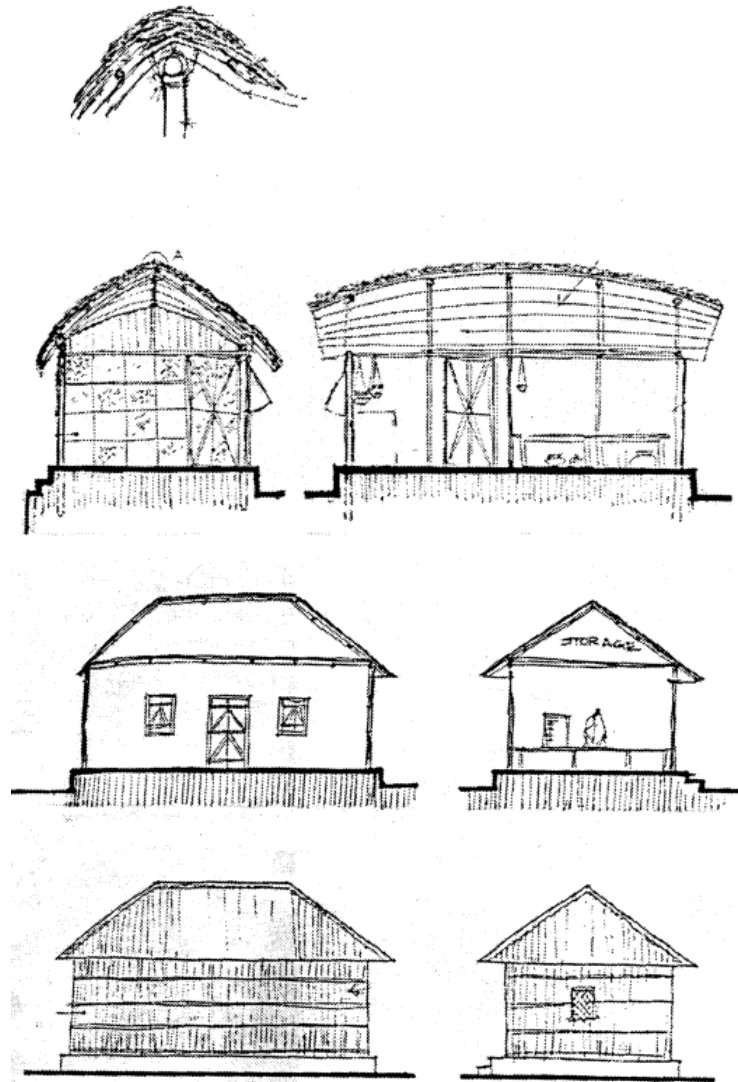
*Figure 105: Probable process of evolution of Superstructure*  
Source: (Prepared by Author)

On top, the roof is created. This is usually a pitched type, with two and four pitched roofs being the most common. Hence, the huts themselves create an extremely strong visual statement. They have distinct vertical divisions -- plinth, walls, and roof. All of these elements are exposed but blended in harmony to one another so that one actually compliments the other and in turn, they all exist in a compatible union of three-dimensional state (Fig.105). For the defenses against enemy and animals, and to remain above floods the creation of a raised area seems a logical attitude.

Geographically and Climatically, the best orientation is south, because it is from this direction that a soothing cool breeze of the summer comes in Bengal delta. Since the cold winds flow from the north in winter, it is to be avoided. Again, western orientation is notorious because of prolonged exposure to the sun's rays, which heats up the hut. Eastern orientation is a possible second to the south. Therefore, the best orientation in these terms would be a long row of huts in a line facing the south. In reality, we know that the houses are four-square and therefore face in all cardinal directions. That the orientation is not ignored, is revealed in the vernacular form.

The materials raised platform of the huts is usually chosen from what is commonly available. The huts are placed in the but they themselves give the impression of being frail, which they actually are. They are frequently damaged or even blown away by winds and storm and have to be regularly repaired and periodically replaced. This is the resilience of Bangladeshi architecture. Thatch, bamboo, jute sticks, mud, etc. are the building elements. The advantage of such light materials is their resistance to thermal storage and their penetrability to moving air. The huts, as they are constructed by themselves, do not seem to be meant for defense but to give with nature. Against animals, the huts are a secondary defense and so their frailty can be understood. Economically the form of the huts shows no deviation between the affluent and the needy. Consequently, in rural areas, although the form has remained the same, the iron sheet house has developed as a status symbol. When the actual structures are being constructed, the people look towards the bountiful side of nature. The tripartite division of the huts i.e. plinth, walls and roof are symbolic of the three kingdoms. 'below', 'here' and 'above'. Although an attic is created because of the pitched roof, there is no attempt to live there. Essentially, it's not man's place to live in. Man has raised himself from the ground by the platform and continues to do so by building a plinth for his hut. He never attempts to dig basements. It would have been an obvious anti-thesis to his achievements. Crowded as he may be in his small hut, the Bangladeshi peasant makes no attempt to increase his space either

downwards or upwards. The form of the house admirably projects this philosophy. The platform (bhita) protrudes from the walls (bera) as does the overhead roof Chala).



*Figure 106: Construction of two kinds of huts  
Bamboo walls and thatched roof*

Source: (Hassan,1985)

## 5.4 Fusion and Transformation

Basically, three principles can be identified from the study of these monuments. First, rectangles are the modulator of the plans, second, the roofs are symbolic elements and third, overall horizontality is the unifying principle. The first speaks perhaps in an allegorical manner, of the basic unit of the *bari*. As the multiplication of a single one-roomed hut becomes the Bengali homestead. The roof signals, quite directly, the common man for whom the structure is created. With reference to chapter 3, it may be argued that horizontality as a symbol of his values is a befitting expression. Since historical times, the Bangladeshi man has taken a modest role in the universe. His religion and philosophy throughout history have taught him to be humble but dignified. This humility also reflects the landscape and ensures visual harmony with his surroundings. This alone may be enough for these to be given a high value in architecture. In the current quest for meaning, these representations are therefore important as evidence because they speak of the meaningful elements of the collective consciousness.

This arrangement between form and space also brings out axiality in their relationships. Consequently, when more than one hut is needed, a second axis at right angles comes into play and hence the courtyard is evolved on three or four sides. It should be noted that the huts retain their individual identity and do not touch at the corners. This is a marked contrast to the situation elsewhere where completely enclosed courtyards form a consistent architectural theme. It may also be pointed out that in all the different stages of house building, neither the sanctity of the courtyard nor the independence of the individual structures is violated. When the extension is required, a new structure space is contrived and the process is started once again (Fig 107), in the contemporary context these isolated structures are connected by open corridors.

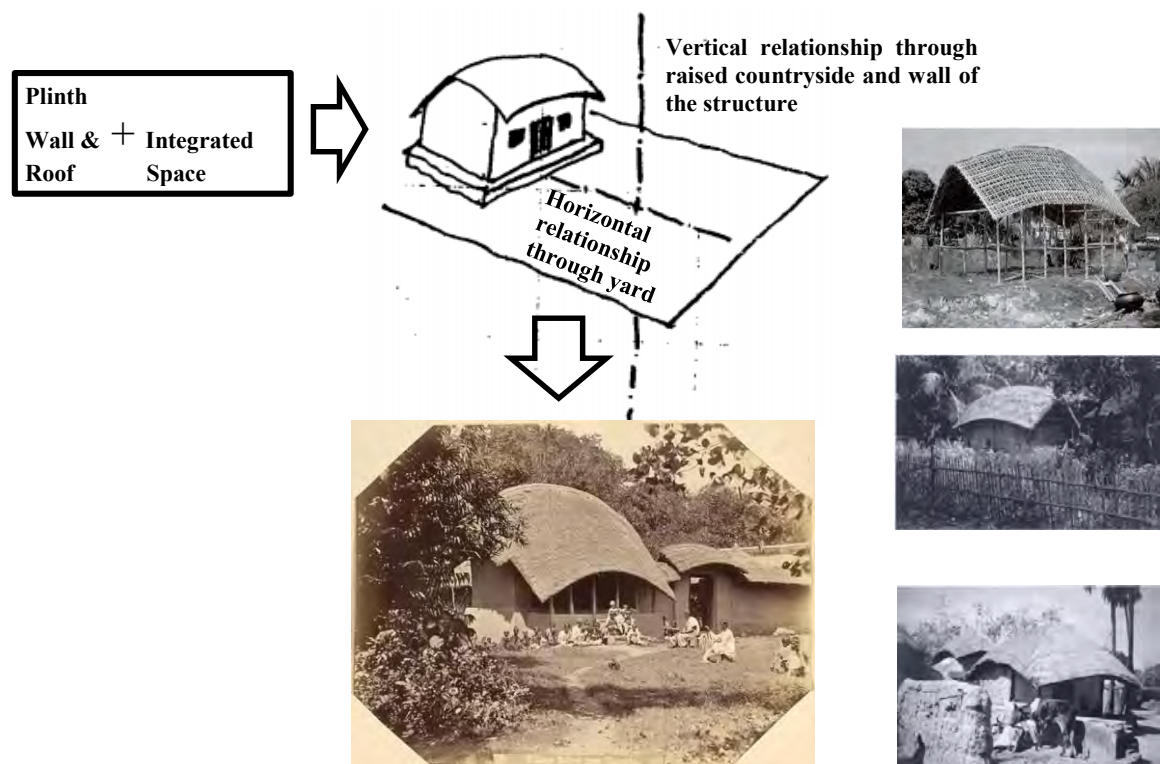
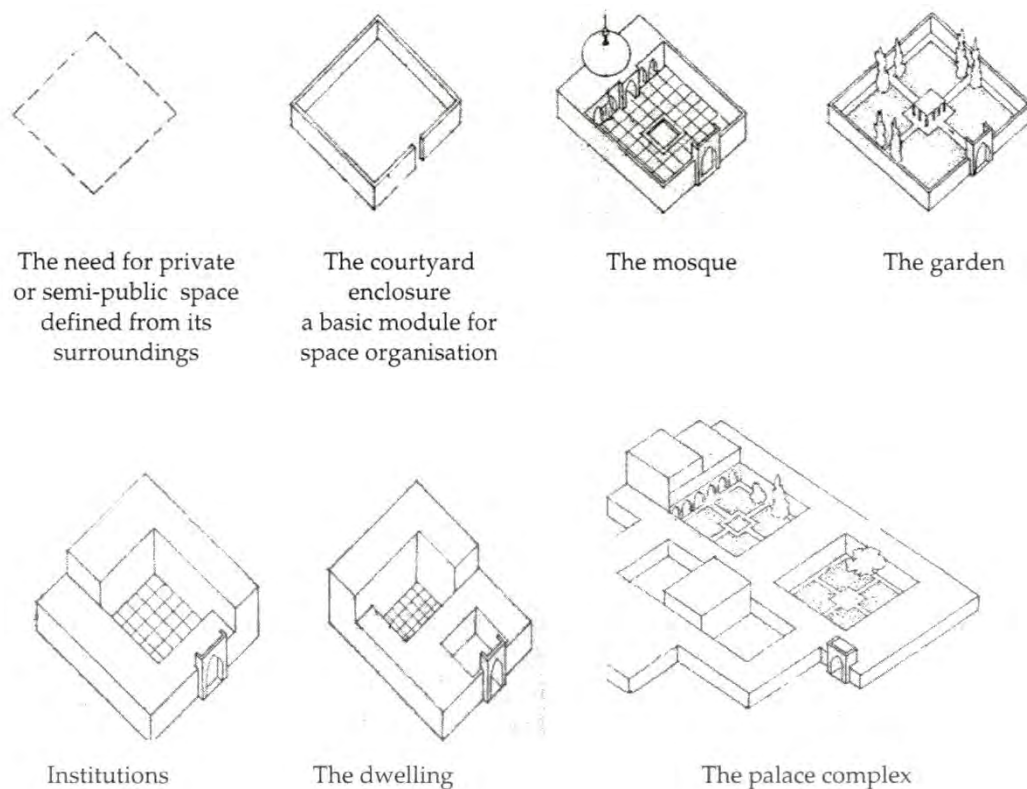


Figure 107: 'House around a courtyard' the basic house form  
Source: (Prepared by Author)

Traditions of Bengal had evolved from agricultural context, they resulted in the close-knit community life where Spaces and functions are carefully articulated and closely interlinked. In the visual relationship of buildings and spaces, functional relationships of activity area and the form and morphology of the context, in presents a strong philosophical foundation. in the sub continental context, a fundamental characteristic of Indo Islamic was the indigenous attitude towards space making. The result is a great deal of informality-the axes always shifts, space moves diagonally, the route shift. Each movement has its own law, but the total amounts to coming together of diverse parts within an indigenous unity. In all levels and scales, the basic model of living space was the courtyard resulting in a figure-ground expression. Vernacular architectural expression may also be interpreted in a similar manner but in a loosely layed setting. Bengal architecture evolving from the agricultural context, when not influenced by the north-Indian or Islamic traditions, evolved into a typology very akin to the archetypical vernacular architectural form of Bengal.



**Figure 108: Transformation of Indo Islamic typologies**

Source: (Mowla,2006)

The peculiar climate and geography of this remote eastern land, more than anything else, have shaped the personality, art, culture, architecture, dress, tradition and the way of life. The pattern of life in this land seems to have remained virtually unaffected over thousands of years. Pliant indigenous building materials, abundantly available in the region, like timber, bamboo, cane, and reed, greatly influenced the evolution of a distinctive curvature of the roof and its cornice which when carried across its facade in a series of parallel curves results in the form of a bow. This is the typical architectural style, indigenous to the land, evidently derived from a bamboo framework, adapted to throw off heavy monsoon rain.



The Singular presence of the Pavilion Structure is the rustic “Bengali hut,” which is essentially a roof meant to thwart the intense sun and the torrential rain and the walls, which are permeable to the movement of air and placed well within the perimeter of the roof. These huts have features like verandahs, terraces, and semi-enclosures which create a dramatic relationship between inside and outside. A traditional “Bengali house” is an inheritance from the past, exist in the present and has a potential for the future. In urban cases too, as far as functional possibilities permit, such is the case. In urban settings, the first step in construction is the delimitation of the plot, usually through the implementation of perimeter walls. Originally, urban houses would conserve many of the characteristics of rural ones, such as the simplicity of spaces and construction, the occupation of the site with courtyards and their relationship to surrounding buildings, etc. Later, the lack of space in cities would lead to important transformations i.e. compactness and more remarkably concerning the height and density of constructions.

The style often transformed into masonry is invested with a freshness and spontaneity, expressive of a rural people keenly aware of the elements of nature affecting their daily life. It may now be interesting to apply this analysis to some contemporary works of architecture in the country. Examples are taken from those where serious efforts are made to create an identifiable architecture which has contributed to their acceptance in the minds of the people at large and denotes the interrelationships of a man with his environment. By the subsequent transformation of deltaic archetype, it can be said that our transition is a transition from old to new, from traditional to modern, from the concepts of the past to the concepts of the future and from the problems of the past to the problems of the future, with a single underlying principle (Fig 109).

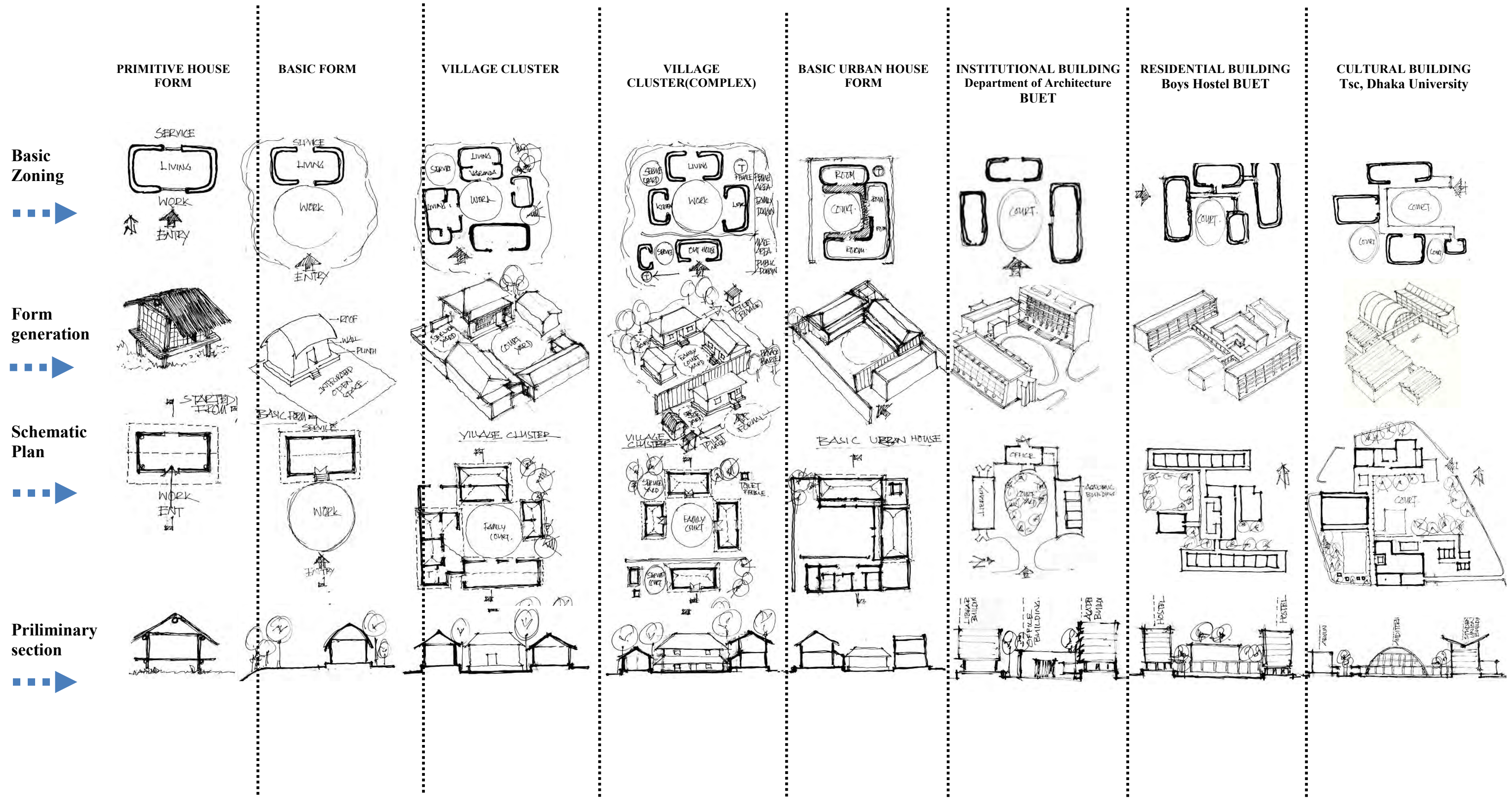


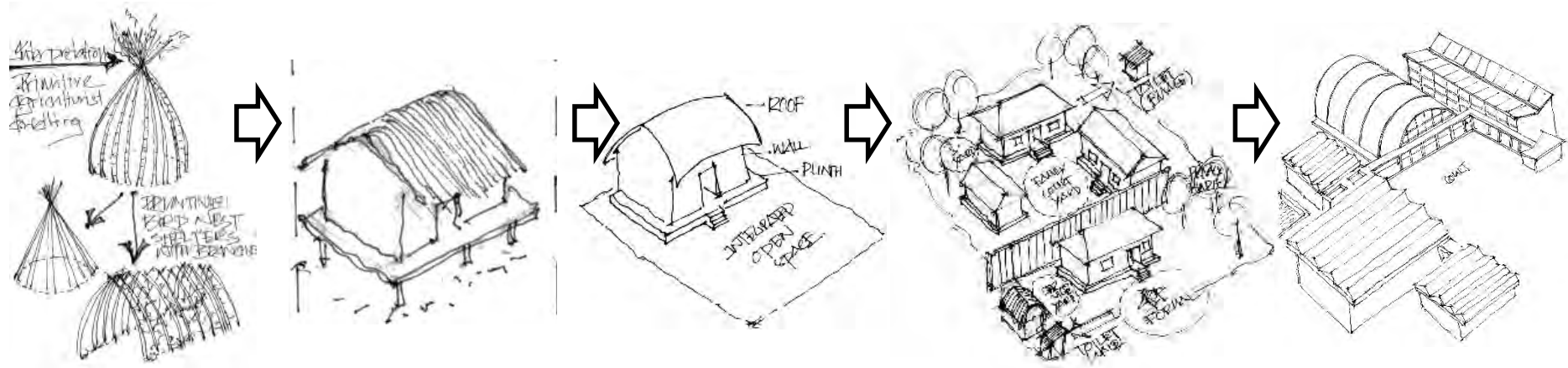
Figure 109: Transformation of Deltaic archetype in Various Form.  
Source: (Prepared By author)

## 5.5 Conclusion

The study of historical forms is essential not only for drawing out principles and elements of building in different times and changing social situations, but it is also a prerequisite for identifying and proposing the presence of types-trans-historical forms that recur through changes in context and periods, and through styles and technologies. In the delta, that form is the hut on stilts. It is also the basis of a paradigm—the deltaic pavilion, a machine for dwelling in the delta. While it signifies “man’s first confrontation to the problem of architecture” in a particular pace and context, its paradigmatic development may be seen as a thousand-year-old reflection on ecology, sociology, and context. The integral relationship between the pavilion and the environment is also the key to complex organization, from simple clustering to settlement patterns, and finally, to a assort of the deltaic city. Deltaic morphology implies the disposition of isolated buildings in a fabric of paddy fields, gardens, orchards, lakes, and ponds. Clusters are formed by grouping pavilion “units”, in a series, or around an amorously interiorized space (the uthan). An understanding of deltaic urbanism lies, not in the dense labyrinthine fabric of cities but in the city forms of the Bengal delta, in the “rice-culture” matrix, where the distinction between urban and rural morphology has not been so oppositional, and where buildings took their place in the natural milieu with minimal turmoil.

The architectural development in the region of Bengal has been defined in the previous chapters above as an indigenous form of the building art particularly expressive of the inhabitants of these parts. Constructed sometimes of laterite, but generally of brick at a later phase, and so actually molded out of the very composition of the earth from which these agriculturists wrested their living, it speaks of the soil itself, and few things can be more fundamentally influential than the nature of one’s native soil. Obviously originating from a somewhat primitive and cabins like structure it gradually evolved into a system derived from the wooden houses and these bamboo thatched huts of the ancestral forest dwellers. This is shown especially in the sloping roof, curved eave, and other similar features, which could only be the result of long years of building in timber and bamboo. Such expedients are the logical outcome of a mind ingenious yet practical, a consciousness which concerned itself mainly in dealing with the elements of powers of nature as these affected the course of daily life by the profound reality or their existence.

The mode of building, although superior to what may be termed folk-architecture, never rose to classical heights, but it possesses a freshness and spontaneity and makes an appeal as it is a reflection of certain racial characteristics. There is a number of mosques, temples of moderate proportions most of which display formations common to all. All this structure designed on the principles of the main structure, square/rectangle in a plan, its wall vertical, but the lines and planes which in most buildings are ordinarily horizontal, in this type are carried across its front in a series of parallel curves, bent in the form of a bow. Such a distinctive application of curves especially affects the form of the roof and its cornice or eave, which is contour, are parabolic, and clearly inherited from a bamboo framework given this shape in order to throw off heavy monsoon rain. Huts with a thatched roof built on similar lines are common in most part of Bengal, and the somewhat indeterminate curved effect of the upper portions conveys the impression of a people bending before the elements, of yielding to them rather than defying them in view of their relentless power. As an instance of the persistence of this tradition in the building art of Bengal, the principle of the curve and reproduced a replaced in modern roofs of corrugated iron, a material which, in spite of its intractable nature, is forced to follow the bent bamboo (Fig 110).



*Figure 110: Transformation or evolution of Deltaic archetype evolved into various forms in response to technical, social and cultural evolution.*  
Source: (Prepared By author)

From the examples cited and the discussions made in the previous sections, one may conclude that the traditional architecture of Bengal is characterized by a synthesis between a shelter and space. The rural examples display this relationship by each being composed of a transverse house with a yard in front of its central entrance. In the dwellings of the traditional type, centrality in Structure and space relationship is further emphasized by introducing curvature in the roof. The yard that is created on the raised earth plinth in front of this dwelling is equally important as is evident by its being very well maintained. In this way, covered and uncovered spaces are brought into a complex union. The relationship established in this manner is an axial one. However, there is not only a horizontal dimension to this relationship but also a vertical one. The yard is raised above the surrounding countryside and has the front wall of the structure at the rear. The horizontality of the landscape draws attention to the sky and further emphasizes the link between the open raised yard and the sky above. Thus, both the dimensions are symbolized. Therefore, a plinth above flood level, openness, ventilation, rain repelling wall and roof employing locally available materials makes a Bengals archetypical vernacular architectural form.

From a simple shelter in the flood plain with responsive *Bhita* (site), *bera* (wall/enclosure), *Chala* (Roof) and *Uthan* (Courtyard) an archetype evolved in the Bengal delta, this archetype evolved into various forms in response to technical, social and cultural transformation addressing to the prevailing needs. This archetypal form shows a clue to a hidden basic order proving that all the sustainable architectural forms have evolved in this region from the basics. To call an archetype vernacular architecture a '*Bengal's* one, the characteristics which have been identified in this study can assess the potentials of the vernacular materials, method and design, for meeting the growing needs of today and tomorrow and still stick to the basic archetype of Bengal.

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