

RURAL HOUSING IN BANGLADESH: AN INQUIRY INTO HOUSING TYPOLOGY, CONSTRUCTION TECHNOLOGY AND INDIGENOUS PRACTICES

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Introduction

Housing is a more complex commodity than most economists realise. Safety and comfort are still the basic essentials for housing. Housing is a composite social good. There are single family houses, duplexes, apartments, row houses, permanent, semi-permanent, and temporary houses. Housing is not only sold but rented. A housing environment can be an index of the social health, happiness, social justice, and dignity of the inhabitants. Housing has multifaceted economic and social characteristics and it has also social benefits. Housing can hasten community development by improving equity and efficiency in the society. Income earning opportunities can be improved by locating low-income housing areas near employment concentrations.

Rural housing in Bangladesh

About 80% people of the country live in the rural settlements, and 86% of the dwelling units are located in rural areas (GOB, 1993). There has, however, been very little public sector involvement in rural housing. There is virtually no land use plan for the rural areas of the country, which comprises about 85 percent of the total land area. The present facilities in respect to housing and physical infrastructures are very inadequate in the rural regions of Bangladesh (GOB, 1998). Traditionally, rural housing has been taken care of by the villagers themselves. The government could not make any significant contribution in this respect except from the distribution of some building materials, as relief measures in areas ravaged by natural calamities, such as flood and cyclone (Hasan, 1991; 1998).

Because of the subsistence nature of the economy, 85% of the dwelling units in the rural areas are in the form of shelter, which do not provide adequate protection from wind, rain and flood. Presently, there is only one tube-well for every 105 persons to supply drinking water in the rural areas. The sanitation coverage in the rural areas is only 36 per cent of population (GOB, 1998). Due to the natural process of wear and tear, lack of repair, and due to the poverty of

the rural population, rural housing conditions have deteriorated seriously. At present, about 30% of the rural families do not have their own homestead. They live in *Ijmali* (shared properties), mortgaged or rented homesteads. Majority of the houses in rural areas are in unsatisfactory conditions in terms of structural qualities (GOB, 1993). Housing shortage in the rural areas is increasing rapidly, and it is projected that this shortage might exceed 5 million units by now, if the current trend continues (GOB, 1998).

Rural housing: some important characteristics

In rural Bangladesh the housing processes are more vernacular in nature which evolved through ages. It is developed in the rural areas in relation to the physical environment and with the development of socio-economic and cultural set up. The Cultural change which followed the Industrial Revolution in most developing countries has had little impact on the traditional way of life and so on the housing processes in the developing world. Only recently, an accelerating growth of population in a number of developing countries has brought about a change in some of the associations of the functional characteristics of housing for accommodating more population in limited housing space inherited through generations. An example of such a change of this type is the use of courtyard in rural farm houses which was formerly a most essential part of these houses for its manifold uses (e.g. for better air circulation, recreation and for household and other farm related functions). Courtyard has functional utility for husking of cereals, drying of jute fibers, clothes, etc. This space is gradually being decreased by the construction of new housing units and many of the post harvest operations are being performed now in the mills or even on the near by roads.

Design Process

Physical control is quite apparent in the housing processes in the rural areas of the country. Land level is one of the major criteria in selecting housing site. Bangladesh is predominantly a flood plain/delta terrain. For this reason, a major part of the high lands are preferred for building a house. Where high lands are not available or scarce, as in the Haor areas, houses are built on artificially raised ground. Moreover, the availability of housing materials and their regional differences have an impact on housing construction and design. Climatic impact characterizes the roofing design of rural houses. Slanted roof is the common design to drain off rainfall quickly.

Social and economic determinants of the housing processes encompass a number of factors, like the income, status and size of the family in the

household. Besides, a number of cultural practices influence the design and form of house particularly, the orientation or location of individual housing units. For example, sleeping units in the households are generally made south facing by both the Muslims and the Hindus (two major sects of Bangladesh), while kitchens are normally constructed west-facing. The Hindus have the tradition to build cattle sheds and latrines away from the housing complex, however, in some parts this practice is also common among the Muslims.

Housing Layout

House is the symbol of position and status of the rural inhabitants in Bangladesh. Thus housing design varies according to socio-economic status of the household. But this might not be the rule, since often the houses are generally inherited and their structure and design tend to be the reflection of aspiration and status of the ancestors. Nevertheless, large farmers usually possess an elaborate housing structure than those economically less well off.

A house in rural Bangladesh may constitute of one or more rooms depending mainly on the socio-economic status of the owner. Rooms are different in sizes and shapes, though rectangular is the common shape in the country. Around a rectangular or square courtyard, housing units/rooms are constructed. In order to get rid of bad smell, it is regarded sanitary to build cow shed and latrine away from the main housing area to one corner of the housing perimeter. Kitchens, normally smaller in sizes, are built separately. In dry seasons and among the poorer families, cooking is usually done in the courtyard and the space is rarely roofed. Kitchen, cow shed, poultry pen and latrine are less emphasized in the total housing layout as are reflected in their inherent designs and locations. These are usually built of inferior materials and are also poorly constructed.

In some parts, as in northern and mid-western Bangladesh, the houses in rural areas have the tradition of having inner and outer courtyards, functionally have relation with the farm house operations. This is so, since such households, belonging normally to large farmers, have self-reliant functional entity. But more recently, as a result of the pressure of population on land as well as the development of community and village based commerce and agricultural services this tradition is gradually eroding. In some parts of the country, especially in the south, pond is an essential part of the house and has manifold uses. A house is surrounded by perennial trees giving protection from sun, storms and cyclones and also offer some degree of privacy. A house often has a boundary wall to ensure privacy of the inmates, which is normally made of bamboo, palm leave, straw or corrugated iron sheets etc. depending on the

social and economic status of the owner. In some areas, as in northwestern Bangladesh, rooms are built around a courtyard instead of a wall for maintaining privacy to the household.

House Form

The form of house manifests the complex interaction of many factors, which is revealed in variations of the construction designs. The family owning a house made of corrugated iron sheets (CI sheets) is very common in rural areas. There are variations in the design and size of CI sheets. Shape of the roof is related with the status and wealth of the family. Roofs with four facets of CI sheets, *chouchala* (four pitched) and with two facets, *dochala* (gabled), show two major variations in the design and indicate the position of the farmer in the rural society. The high roofed *chouchala* with an attached verandah is aesthetically more attractive than a same sized *dochala* house. The rooms in these houses have high windows. The plinth of these types of houses are sometimes made of cement. Two-storied CI sheet built house, although very rare, are highly prestigious in rural areas. Such houses, which are made of mud/CI sheets, are owned mainly by the rich farmers/households in the rural areas.

Amenities and services

Amenities and services enjoyed by a household in rural areas, such as, water supply, latrine, sewerage, drainage, electricity, etc. do not seem to have priority in the housing structure in rural Bangladesh. Natural sources of water are still vital in rural livelihood but other sources, such as, tube well and well are gradually getting importance now-a-days. About 54 percent of the households use pond as general source of water followed by tube well (21 percent). Drinking water is mainly fetched from tube-well (53 percent) followed pond (21 percent). About one-third of the rural houses do not have any arrangement for latrine. Most houses do not have any drainage facilities.

Construction materials and technology:

House in the rural areas are mainly made of indigenous materials locally available, such as bamboo, straw, grass, jute stuck, golpata, mud and CI sheet. The wall is made of straw, jute stick, bamboo, mud and CI sheets, while thatch or CI sheet roofing, and sometimes with tiles as in some parts of Rajshahi, Kushtia, Bogra and Jessore. Bamboo is widely used as a common house building material.

CI sheets and thatch/leaves (like golpata) roofing is found in majority of houses in rural Bangladesh. In most cases the floor is made of mud (i.e. *kutchra*). Cemented floor, brick built wall and concrete roofing used to be rare in the rural

areas of the country. However, these are increasingly becoming common in many villages of Bangladesh. Previously, the houses of the big landowners and the former zamindars (landlords) were mainly included in this groups (Rashid, 1977). Brick built mosques or temples are not uncommon in the country. About 35 percent of roofs of rural houses are built of strong materials which range from cement and mortars to CI sheet and wood, and only 13 percent of the wall of the housing units are made of permanent and semi-permanent materials, like, CI sheet and cement/brick. A large proportion of dwelling structures in the rural areas appears to be temporary in nature (BBS 1984). This type of temporary construction can be called *kutchra*, which accounts for about 80 percent of the total rural houses the physical conditions of most of which may be described as moderate to poor (GOB, 1998).

In the above discussion, the general characteristics of housing materials used in rural Bangladesh is described briefly. It has been observed that straw and bamboo are the most commonly used building materials in the construction of housing in rural areas of the country. These are used as the chief construction materials for walls. Straw, and bamboo form the main housing materials for the construction of both wall and roof. In Pabna and Sirajganj districts CI sheet is mainly used in the construction of walls of houses. In Dhaka District, the use of cement and brick is quite common as materials used for both walls and roofs perhaps due to the nearness to the capital city and also to relatively better economic condition of the inhabitants as a result of the degree of urban exposure. The cement and brick walled house are also prevalent in border region of Jessore district, which may be due to long settlement tradition adjacent to old human habitat near to West Bengal. In this area, mud walled and tiled roof house with spacious courtyard are also quite common

Mud/kutchra brick is commonly used in the walls of the houses in some parts of north Bengal for their higher elevation above flood level and soil characteristics. Similar houses are also prevalent in Kushtia District where the house are built with high plinth and spacious verandah and have inner courtyard to accommodate storage units. Tiles are predominantly used for roofing of the house in Naogaon District and also in western moribund areas. While, CI sheet form the common materials of houses in Southern Bangladesh (Hasan, 1999).

The above discourse portrays only the key characteristics of building materials in rural Bangladesh, and some exceptions are not unlikely. However, the generalized picture of the materials used for housing can be broadly classified under: (a) *kutchra*, (b) semi-pucca, (c) pucca. It should be noted that the pattern obtained through the categorization of rural dwellings into these three main classes closely follow those obtained earlier.

Rural house types of Bangladesh

In the plain lands of Bangladesh, though there is much similarity than difference in geographic condition, there are some variations in the housing characteristics. Houses are often constructed of reeds and have varying sizes and shapes. Majority of these houses is temporary in nature. In the rural areas of Bangladesh, the following types of houses are commonly found in different parts of the country (Hasan, 1999):

Bamboo walled houses

In some areas in the eastern and northern part of Bangladesh, the houses are mainly bamboo walled, with thatched curved roof built on high plinths. Shapes are predominantly oblong. A small verandah with wood or bamboo support is the common design. Plaited bamboo plastered with a thick layer of mud, which is often used as walls for house construction in southwestern and northern parts Bangladesh. The same type of housing style is also common in the islands and in the coastal regions of Chittagong. In the latter case, the only difference is found in the roofing design, which is usually constructed as double facet and the main roof is separated to that of the verandah. The houses are mostly one and a half storied in height. In the rural areas, in and around Dhaka, Narayanganj, Chandpur and Pabna, bamboo walled houses with tin sheet roofing are quite common.

Mud walled houses

The northwestern regions of Bangladesh have a distinctive characteristic in mud-walled housing. Oblong shaped mud walled houses with thatch and tile roof are common in Bogra, Pabna, Khushitia and Jessore. In Chapai Nawagangj, the roof of a mud walled house is molded by brick dust mixed in with lime, which is peculiar to this area. In the region from Bogra to Kushtia, mud-walled houses with tin sheet roofing are another common type. Relatively taller mud-walled houses of about 15 feet high are found along the southwest border of Bangladesh. Bamboo fenced outer boundary walls of houses, is the characteristic housing feature of the region between Darshana and Jessore. Above flood level land, relatively less rainfall and dry climate, and *lateritic* soil are the main reasons for the development of mud walled housing structure in these regions.

Mud-walled houses with two to three level roofs are common in Chittagong region. The walls are made of sun-dried mud of one to two feet thickness. The heights of these houses can vary: one type is about ten feet high, and the others are around double its height. The roofs of the house are thatched, tiled or made of tin sheets

Timber houses

A relatively small population group of Bangladesh build timber houses. In the Mogh communities of Cox's Bazar, Teknaf and Moheshkhali, timber houses represent a different cultural heritage with distinctive architectural tradition. The houses are normally built on wooden distinctive architectural tradition. The houses are usually built on wooden platform above the ground, to keep away from poisonous snakes and ferocious animals. The reasons could be the existence of forests in surrounding regions, which are also infested with wild animals and reptiles. These forests also provide ample timber for house construction. The space beneath the platform allows free airflow, and is also used for various household purposes. The houses are generally painted black, and have woodcarvings on cornices and doors.

Timber and brick built houses

In the eastern part of Sylhet, often the floor, bottom section of walls and the plinth are made of brick, and the rest of the wall is made of reed or bamboo matting, plastered with cement or mud on both sides. These houses have timber frames and columns. The roof is normally made of tin sheets or straw. The use of cement is common among the well off families in this region.

Corrugated iron (CI) /tin sheet houses

In Sylhet region, especially in the northern part where rainfall is very high, houses with tin sheet roofing are very common. The development of this house can have its origin in the British colonial past, when such houses were built in tea plantations and in administrative headquarters. These houses also provide effective protection against heavy tropical rain, and the sheets are damp-proof, light, and durable (Sultana, 1993).

In northeastern Bangladesh, particularly in Sylhet region, houses have their boundary walls made of tin sheets or bricks. Some of the boundary walls are colorful and have high gates, which are considered prestigious in this region. Often the owners of these houses reside abroad and mainly in the UK.

In the southwestern part of Bangladesh: in Faridpur, Madaripur, Barisal, Patuakhali and Bhola, tin sheet houses are also common, where sheets are used both for roofing and wall construction. In central Bangladesh, such as in Dhaka, Comilla and Mymensingh, tin sheet is mainly used for roof, while mud or mud blocks are used for walls. In the southern part of Khulna, especially in the Sundarban region, golpata is commonly used as a roofing material for bamboo walled houses.

Thatch/straw walled houses

In the Haor basin and in areas along major rivers of Bangladesh, cheap building materials like reeds, long grass, thatch, and jute sticks are widely used for roofing and wall construction. This is mainly because of the fact that reeds and long grasses are abundantly available in char areas and on riverbanks, and these are also very cheap. Moreover, these areas are often flood prone and subject to various hazards and risks like river bank erosion, which forces people to use cheap material for house building. In relatively flood free areas, such as in Bogra and Tangail district, temporary roofing materials like thatch or long grass is used on mud walls.

Indigenous practices in rural housing

In rural areas of Bangladesh, the housing processes are more vernacular in nature, which evolved through ages. These housing processes manifest the agrarian economy of the country, and have developed in relation to its physical and cultural set up. Rural houses are generally constructed of locally available indigenous materials, and these are characteristically less variable. The majority of rural houses are apparently temporary in nature, particularly with respect to the materials used for their construction (Hasan, 1999).

Vernacular building forms are well developed in rural Bangladesh, but these are undergoing rapid changes because of the industrialized building materials. The use of corrugated iron (CI) sheets has become quite popular and widespread, and the production and use of traditional building materials is diminishing consequently (Ahmed, 1994). Vernacular architecture in rural Bangladesh has evolved corresponding to its main physiographic regions. A number of techniques for house building using indigenous materials exist in the country. The layering technique involves building with large earth blocks or sun-dried bricks. There is another commonly used technique, which is plastering bamboo mat walls with mud. This method adds sturdiness to the otherwise flimsy though highly developed bamboo construction techniques (Ahmed, 1994).

As discussed, different kinds of indigenous practices are found for house construction in rural areas of Bangladesh. In the northwestern region, particularly in the barinda highland, houses are often made of mud and earth. At first, mud is collected and kept in a mound and wetted regularly by pouring water. The people themselves soften the mud by pressing it with feet. In the end, the soften mud is put at different layers for building the walls of houses. In some areas, particularly in the southwestern region, construction of houses with sundari tree as support material and *golpata* as shading material is very common. At first, the frame of the house is made using *sundari* planks or poles of different thickness. Outside cover is then attached with this frame. The choice of building

materials for this depends upon the affordability of households. Some people use Galvanized Iron (GI) sheet, some use thatch, and some use bamboo mat or wood. Often the bottom portion of the walls is constructed of 5-inch thick brick walls (sometimes the entire walls). For rural housing, the common practice in most areas of Bangladesh is to use bamboo frame. Bamboo poles are first dug deep into the ground and then it is fixed strongly by compressing earth around the bottom of the pole. Then transverse bamboo rafters are tied with the vertical poles. These are tied either by steel wire or rope. And finally, the frame for the roof is made. In the end, different kinds of materials are used for covering the frame. For example, GI sheet can be used for both walls and roof. Bamboo mat for walls and GI sheet for roof. Alternatively, bamboo mat for walls and either straw, grass or thatch can be used for roof. A number of indigenous construction techniques are also found in the rural areas of the country. Phasing construction over a period of time is very common. Often the walls and frame of the house is constructed in one season or year, and the roof is made in another year or season. Upgrading or extension of house over time is another common practice. Often thatch roof is replaced by GI sheet roof when households have enough money is at hand. For rural houses, the common practice is to build a one-room house first. Then incremental addition is made to the house: e.g. a few more rooms, a verandah, a permanent kitchen, or better quality windows are added. However, the toilet is generally placed a little bit away from the main house. Attached toilet is still very uncommon in the rural areas of Bangladesh. In rural areas, most of the houses are placed around a courtyard. This inner court provides light, ventilation, seating and cooking area and a private space for the family members. This is a very vernacular, fundamental and indigenous concept of house building in the country, and has been practiced in Bangladesh from generation to generation.

Conclusion

Housing processes in the rural areas of Bangladesh are more vernacular in nature, which has evolved over a long period. Houses are often constructed of reeds and have varying sizes and shapes. In some areas in the eastern and northern part of Bangladesh, the houses are mainly bamboo walled with thatched curved roof built on high plinths. The north-western regions of Bangladesh have distinctive characteristics in mud-walled house. A relatively small population group of Bangladesh build timber houses. In north-eastern Bangladesh, particularly in Sylhet region, houses have their roof and walls made of CGI sheets or bricks. In the southern part of Khulna, especially in the Sundarban region, golpata is commonly used as a roofing material for bamboo walled houses. In Bangladesh, very little government attention is given to rural housing except for a few NGO assisted houses. Still housing situation in the

rural areas of Bangladesh is by far better than the urban slums and squatter settlements. One important reason can be said that the rural households are generally the owners of their homes and homesteads. Therefore, they try to maintain and clean their houses as much as possible within their affordable limits. But in urban slums and squatter settlements, the occupier have very little right over the houses where they live. Unfortunately, in recent times, there is a phenomenon of rural slum development in many areas of Bangladesh. Increasing population density, lack of any space for house construction, dwindling land man ratio, and persistent poverty of people are the main causes for such development. The government can come forward to provide land (particularly khas land) to these rural slum dwellers, especially for house building. In most cases, the rural people know better how to build their houses, when to build, and what materials to use than the professional builder or engineers. They have a keen sense of resource management for house building within their meager means, which calculative and strategic planning may not be able to work out. This is basically by virtue of their indigenous knowledge passed on to them from generation to generation. Therefore, professional planners, architects and engineers have many things to learn from them. What we can do is to provide the rural people with adequate finance, building material, a little bit of know-how, informational and infrastructural support. For example, most of the rural areas of Bangladesh are beyond the electricity and telecommunication coverage of the country. Provision of infrastructure like physical access electricity and telecommunication facilities would definitely increase the quality of life of rural people. And finally, financial assistance (either in cash or kind) would eventually enable the rural people safe and permanent houses that they can build according to their own needs and resources.

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