Emergence of Open-spaces For Dense Dhaka:
Searching for Solutions from Traditional Settings

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ABSTRACT

In the traditional settlement patterns of Bengal, outdoor space has been hierarchically arranged and the people of this area have habitually socialized in these spaces. This localized practice led to the formation of a hierarchy of traditional outdoor places from small-scale indoor courts to large outdoor spaces for public gathering. In Bangladesh, a tropical country, open space carries an important functional and environmental purpose especially within the residential setting - both in rural and urban areas. But unfortunately, with the recent acceleration of development pressure in the urban areas and Euro-centric urban practice, the traditional sense of open space has been overlooked. Housing and other developments are overcrowded with towering living blocks without any open spaces left within them. In this context, this paper illustrates the meaning and purpose of open space in the context of Bangladesh and its role in improving environmental quality in residential areas for housing development. By referencing the past, the paper also established the importance of hierarchical traditional settlement and its integrated open spaces for a healthy living environment. Here it is emphasized how recent random development generating urban spaces and forms disregard cultural language. Finally, the paper will try to produce as a referential framework some credible approaches to integrate the sense and figure of open space within the built form of Bangladesh following its cultural value.

Keywords: *Urbanization, Traditional setting, Urban open space, Cultural demand, Environmental quality*

INTRODUCTION

Dhaka, the capital of Bangladesh, is one of the most densely populated cities in the world, and must confront the problem of huge population pressure on urban land shrinking its urban residential open spaces and deteriorating the quality of life and environment of the city. Unresponsive development in urban areas is narrowing residents' access to open-spaces, negating the enjoyment of civic life, mostly affecting children and young people. Contrarily, the people of Bangladesh have the traditional habit of socialization in outdoor spaces. This practice led to the formation of a hierarchy of traditional outdoor places from small-scale indoor courts to large outdoor public gathering spaces. This culture, derived form indigenous settlement patterns, are more interesting and the traditional pattern suggests several ways in which people can co-exist in dense cities, achieving an integration of living and working, family and neighborhood, rich and poor. By investigating the cultural-social-environmental aspects of vernacular settlement, it is possible to formulate credible approaches for structuring

urban open spaces within dense urban residential environments. Thus the core premise of this paper is that open space is an integral part of the built urban environment, enhances the quality of life, contributes to the sustainability of urban areas and plays a role in the formulation of civic identity. This paper further elaborates the assertion that the existing theoretical frameworks, based on Euro-centric, western approaches and practices, are inappropriate for the development of diverse cultural dimensions specific to the South Asian context. Finally, the paper also suggests a few innovative approaches to maintain the traditional socio-culturally charged open spaces that are essential for every day civic life.

URBANIZATION IN DENSE DHAKA LEAVING LITTLE BREATHING SPACE

Urbanization is a relatively recent but an increasingly significant process in Bangladesh. Within a period of just fifty years, the proportion of urban population in Bangladesh has increased from less than 5% in 1951 to over 20% in 2011. Population projections predict that the proportion of people living in urban areas would reach 70% of the total by 2025. In other words all the population increase in Bangladesh from now to 2025 will be in urban areas. With a current population of 10 million, Dhaka is the fastest growing urban center in Bangladesh. It ranks 22nd among large cities in the world and is still growing at an annual rate of 6.5 percent. By the year 2015 Dhaka is expected to rank as the 5th largest city in the world.

This has been an all-too-familiar model of urban development in Bangladesh. Unplanned urbanization has tilted the open space ratio for the worse in the capital city over the years, narrowing the residents' access to recreation places. City planning in Dhaka through the Dhaka Improvement Trust (DIT) has also given little attention to open space when preparing the master plan for the city. DIT prepared two master plans for the city — one in 1959 and another one in 1995, the Dhaka Metropolitan Development Plan, which was approved in 1997. The agency defines parks, playgrounds and lakes as open spaces for recreation. But none of the two plans detailed the development of any such places, and the agency does not have any measurement of the existing open spaces in the city. The 1959 master plan was prepared taking into consideration four acres of land as open spaces for an area inhabited by a thousand people, following a model used in Singapore. But the present guideline, worked out in 1995, earmarked four acres of land as open spaces for an area of 25,000 people. But the real situation offers 1.6 acres of land for 0.1 million people. And all of these open spaces are concentrated to only 38 of the 90 city wards, most of them unusable because of unlawful occupation. In the old part of city there is only 5% open space while in New Dhaka 12 % of land is green and open. The total amount of open spaces in greater Dhaka is about 17% to 18% and the total stock of public open spaces is hardly over 5000 acres (Mowla, 2011). If such unplanned urbanization and population growth continues in such a manner, there will be no open space left in ten years.

PLANNING STANDARD FOR OPEN SPACES IN RESIDENTIAL AREA

Planning standards for the development of residential areas act as a guideline for ensuring environmental quality. The Ordinance of Private Residential Project, 1991 which was applicable until February 2001, did not provide all the necessary standards for residential area development regarding services, facilities, roads, open spaces, etc. However, the Ministry of Housing and Public Works enacted 'The Land Development Ordinance for Private Residential Projects' on March 2004. The structured standards for recreational spaces in the country as well as international standards, planning standards for residential area development regarding services and facilities are stated here just to present an idea of required open spaces for livable environment, whereas the Bengal cultural behavior might demand more.

Every residential area requires a wide range of recreational facilities. Play lot, playground and playfields are recreational facilities that must be provided by the developers to ensure recreational facilities for the inhabitants. The standards for play-lot, playground, play field and park vary among different nations. Bangladesh is a developing country and the population density of the Dhaka city is very high. As a result, the planning standards of the country vary from international standards. Considering these factors, the following planning standards are given for play-lot, playground, play field, and park of the cities of the country.

Table 1: Standards for playground for a residential area according to population.

Population	Number of Children	Size in Acres
2000	450	3.25
3000	600	4.0
4000	800	5.0
5000	1000	6.0

Source: Gallion and Eisner, 1986.

Table 2: Planning standards for playing-lot, playground, play field and park for a residential area.

Type	Recommended space standard for the cities of our country (Acres Per 1000 Population)	Space Standard for U.S.A. (Acre per 1000 population) U.S.A	Recommended size for the cities of our country (In Acre)	Ideal Size (U.S.A)	Maximum Distance served/ Service radius
Play lot	0.025	0.25-0.5	0.4	1	1/8 mile
Playground	0.10	1.5	1.2	3	1/2 mile
Playfield	0.10	1.5	06	15	1 mile walking or1/2 mile riding
Park	0.12	1.25	08	20	1 mile

EUROCENTRIC RESIDENTIAL AREA AND PEOPLE'S ADAPTATION

To meet the housing demand of a rapidly expanding city, the city authorities initiated the building of residential areas since 1947. But from the beginning the city faced the dilemma of the conflict between indigenous ways of life and western housing planning. Ignoring the richness of traditional contextual settings, the new residential areas were organized with independent plots and subdivided by straight roads. Here planners did not take the demand and behavior of the residing people into consideration. They were not concerned about the integrated network of indigenous settlement and the relationship among hierarchical spaces.

As a result, six-storey apartment blocks characterize the residential areas, as an outcome of the maximum utilization of buildable floor area. That authority, DIT, through its building codes, controls this type of development. Besides DIT codes there are other building rules and regulations from the Bangladesh National Building Code, (BNBC), which also have the same objectives of controlling the development of buildings on plots. Both of these codes consider the pavilion type of building, developed in planned residential areas, as a single entity rather part of a group of buildings. The codes give some mathematical numbers for building set backs from plot boundaries, which have little relationship with the height of the adjacent buildings, enclosure feeling, or orientation. So they allow development of buildings that are climatically wrong (Rahman, 2000). This situation consequently created an environment that acts as a barrier preventing inhabitants from exploring their surroundings independently. Again according to these codes a building has no relationship with the surrounding built form. The only relationship in terms of building height is seen with the adjacent front approach road. The open spaces generated around the building following the codes have no relation with orientation, enclosure and other climatic considerations. The result is a series of inter-building spaces that form unusable narrow canyons.

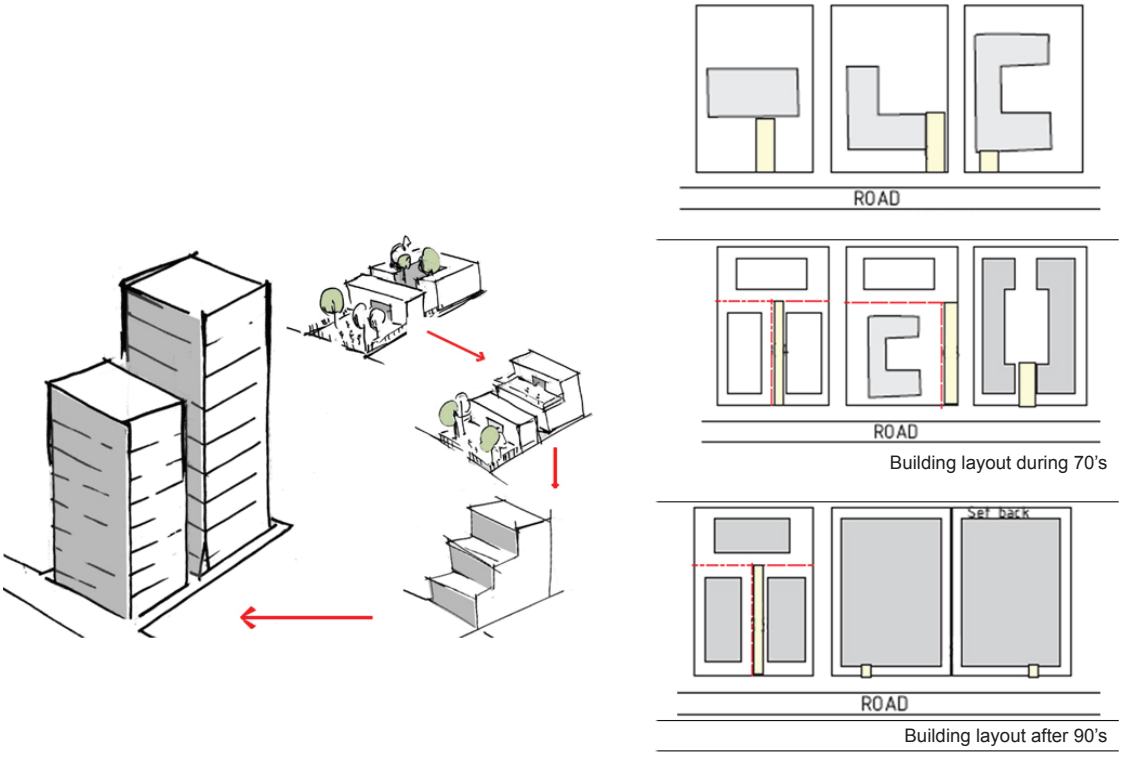
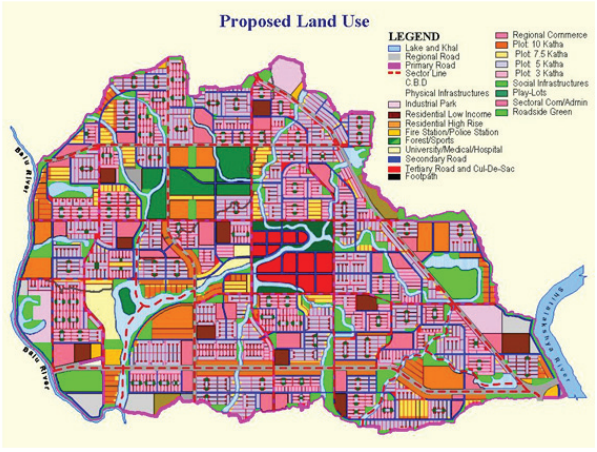


Figure 1:
Transformation of built form to face the population pressure ignoring the traditional space standard.

Following these strategies, the government since the 1950's developed some residential housing projects. Dhanmondi Residential Area, Gulshan Model Town, Uttara Model Town, Mohammadpur Residential Area, Bashundhara, Purbachal all are dedicated residential areas with individual plots subdivided by gridiron road networks. There seems to be a preference among the residents to live in planned areas in order to have a better physical environment for healthy living. But people who live in both planned and organic areas show a 91 percent preference for indigenous social and spatial environments (Mowla, 2003).

Although the earlier building typology for each plot had open space in front and back of the houses where youth and children could meet, assemble and play, presently densification and changing land use of these areas leaves even the smallest open spaces occupied. Previously, the number of strangers was less and most of the occupants were owners of the plots. Inter-plot relationship were more intimate than the present. Now, as land value has increased, plots are subdivided, the ratio of renters increased and buildings are allowed to be erected within the whole plot except for the peripheral minimal set back. Landscapes for strolling and for children playing with neighborhood mates have been reduced to a great extent. As a result, sometimes the access road to the deeper subdivided plots, parking lots, and narrow space of building front are the only spaces on the ground where neighbors can meet, gather, play and stroll around. Moreover, the random unplanned mix-up of commercial uses with residential areas caused high-density vehicular traffic and strangers within any part of the area. This resulted in insecure front road for younger groups and other social crimes. Due to lack of planning in hierarchical traffic flow and neighborhood design, people feel insecure to use even the smallest open spaces.



Dhanmondi Residential Area
Year: 1950s
Area: 472.64 Acres
Authority: Public Works Department

Purbachal New Town Project
Year: 2010
Area: 6150 acres that is divided into 30 sectors.
Authority: Dhaka Improvement Trust (RAJUK)

Figure 2:
Residential projects done by city authority with western influence, imposing rigid gridiron pattern on fluid landscape.

WESTERN INFLUENCED DESIGN: DHANMONDI RESIDENTIAL AREA AS AN EXAMPLE

Dhanmondi Residential Area (DRA) is the first planned residential area in the urban context of Dhaka. It was built during the 1950s and is inhabited mostly by middle- and upper middle-income people. Earlier, the area had a good reputation as a green and calm residential environment. Now, the population of this area is almost 17 times greater than the density designated in the beginning. In the master plan there was no provision for community facilities nor was there a proper hierarchical distribution of open spaces for children and adults (Mowla, 2002). The morphology of public open space within the area includes a natural lake, lakeside green areas, four segregated play areas and an internal road network. Private open space consists of the residues within individual plots excluding the ground coverage of the buildings. In most of the cases, the private open spaces are segregated from adjacent open spaces by high boundary walls. Before the 1980s, individual plots had comparatively large open spaces within the private boundary. Present observation shows that recent apartment-complex development has changed the built and unbuilt area ratio within plot from 25%: 75% to 75%: 25% in the post development period.

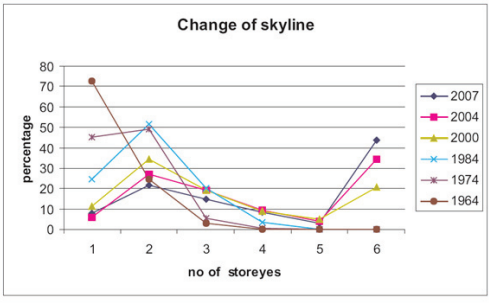


Figure 3:
Changing skyline of Dhanmondi residential area.

Figure 4:
Land use changes randomly from residential to commercial and mixed use.

CITY PEOPLE TRAPPED IN URBAN BOXES

It is generally acknowledged that the urban quality of life in Dhaka has gradually deteriorated both in social and physical terms due to numerous factors. The poor state of open space negates the enjoyment of civic, recreational and aesthetic rights of the city-dwellers. Contamination of the environment and the destruction of the ecosystem are also happening. The lack of sustainability in the new developments appears as a threat to environmental conditions. The failure to protect the city's green, open and recreational spaces has contributed to an imbalance in life. People living in the dense residential slums and in blocks of high-rise apartment have little chance to know their next-door neighbors, are isolated from nature, have little or no greenery and no playground or space to stroll. In this dense urban area children are in the most vulnerable position, they are the supreme victims. Here the children are kept in a kind of 'box' where they not are allowed to move out on their own, cannot play around in the green, listening to birds chirping. Such a life makes them feel bored and they become squeamish. Children living in this crammed residential area have nowhere to escape to refresh themselves and lack social communications. Moreover, people who have no outdoor space to interact with others become unaware and ignorant about social demands. Recreation only depending on cable television and the Internet lacks physical interaction with local people and social-cultural values are threatened to become forgotten.

Figure 5:
Densification ignoring the people's basic civic need

LOOKING BACK TO DHAKA URBANISM

Dhaka has experienced generations of settlement patterns with specific historical functions. The region has passed through various socio-cultural phases, which are evident in its settlement patterns. The total period of urbanization can be historically divided broadly into three major periods: ancient, medieval and modern. The thousand-year long ancient period, starting from 2500 BC, had influences of both Aryan civilization from the north and Dravidian civilization from the south. This period is known as the golden age of ancient Bengal. Muslim rulers who came from Central Asia from around 1200 AD influenced urbanization during the medieval period. The settlement pattern in this period was influenced by Arabian and Persian values. There were about 3,000 large towns, which contributed to the urbanization of this region with huge traditional production centers. Finally, the Modern period, roughly defined from European colonization to the recent period of Independence. During this time urbanization was strongly influenced by colonial social, political and economic attitudes. In most of the towns of the colonial period, only small sections were planned and subsequent growth was by accretion. An ad-hoc manner of overtaking adjacent villages was open ended and demographic and spatial extension was uncontrolled (Mowla, 2003). These processes of development boosted up the uncontrolled urbanization, which is still considered as a symptom of the lack of development for this region.

Dhaka, the present capital of Bangladesh, has a recorded history of 500 years, and its urbanization can be classified into two general phases: Pre-colonial and Colonial. During the ancient and medieval period, from around the 14th century AD, Dhaka became a center of trade and commerce because of the geographic location and proximity to the former capital of Sonargaon. Because it was an important place for trade, Dhaka attracted artisans, craftsmen and manufactures. These professional groups arranged their settlements in dense villages with a main shopping area along the central spine. This commercial axis is called the *chouk* in the indigenous settlement pattern. Besides the *chouk* straight roads acted as a main commercial and administrative zone with irregular roads feeding to the residential areas beyond. The basic physical module for settlement, the *mahalla* was formed during this period. It comprised a homogeneous community having self-contained facilities derived from the indigenous village pattern. The courtyard (*uthan*) house, introduced by the people of Central

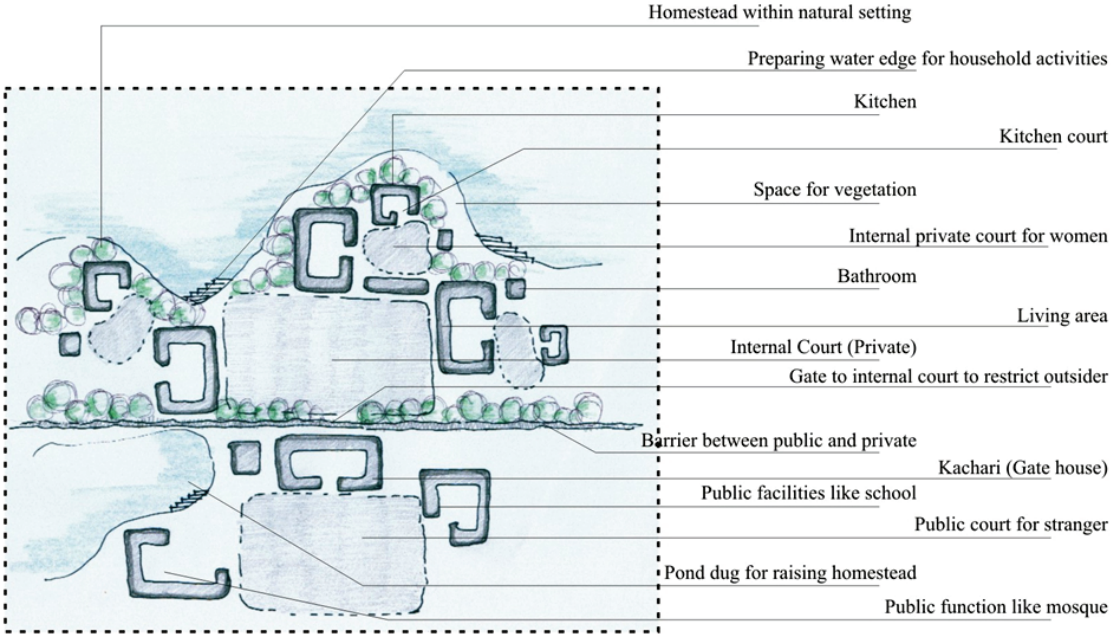


Figure 6:
Indigenous courtyard houses became the module of space formation in the community level.

Asia, became the basic module for arranging living spaces. The small scale, intimate outdoor courtyard space, surrounded by houses, was used for different household activities and became the basic module of community spaces within different hierarchies. The irregular roads towards the central commercial spine from different neighborhoods served as the common gathering space at different junctions of streets. This indigenous urban typology was adjusted to changing social, political, religious, cultural demands and became the regional identity.

For two centuries since 1757, British rule imposed a great impact on the settlement pattern of this region. The developments under British rule were in clear contrast with older settlements. Whereas the previous traditional urban spaces had a strong sense of enclosure and sequential relationship from part to part, in the new colonial layouts, big track of land were sub-divided into roads and plots. The inhabitants built their houses within the plots in a bungalow pattern with individual private spaces. This pattern of settlement did not support the same type of social interaction within the community like the indigenous one. Administrative wards during the British period were just administrative entities, not social units. The more common indigenous pattern reflects uncontrolled growth, with mixed land use and smaller but more numerous foci of activity. On the other hand, colonial typology features a formal street pattern, segregation of functional areas and the repetition of similar features. (Mowla, 2003-A).

CULTURALLY SPECIFIC PERCEPTION OF SPACE

In order to make the city livable for its habitants and to ensure all cultural demands are met, it is imperative to understand the traditional, indigenous socio-cultural dynamics of a city. It is of course distinguishable and remarkable from one country to another and notably different from the developed region to developing countries. Although, Dhaka is moving towards the formal pattern of the West, the indigenous settlement pattern reflects the city's historical social demands and values. As Balkrishna Vithaldas Doshi has shown, a dynamic culturally derived morphology can easily adjust with contemporary demands and allow for the pressure and requirements of changing time.

The geo-climatic condition of Bangladesh has a profound effect on settlement patterns and the social attitude of people of Bengal. Consequently, by habit they are accustomed to live with nature, and feel comfortable to perform different household and social activities in outdoor spaces. This habit led to the formation of traditional outdoor civic places like *gali* (lanes, by lanes), *mahalla* (indigenous neighborhoods), *morh* (neighborhood round about), *chouk* (square) and *bazar* (bazaar or market) etc., as a cornucopia of myriad events and human activities. Indigenous settlements are highly articulated and their pattern suggest several ways in which people can coexist in cities, achieving an integration of living and working, family and mahalla (indigenous neighborhood), rich and poor (Mowla, 2003). Fundamental characteristics of indigenous urban patterns are winding and intricate streets and walls defining spaces. Depending on the location in the settlement, the roads can be a mahalla bazaar, a private lane, behind the wall – a shop or a house. This traditional settlement morphology emphasizes concern about space, the interaction between spaces, a hierarchy and use of streets and lanes rather than straight, wide roads with uniformly setback buildings of current city layout practice. The indigenous layout provides a great quality of spaces with their strong sense of enclosure from indoor courtyards to public bazar (market) and provides sequential relationship from part to part. In the new layouts, the roads instead of being the arteries that feed the urban fabric, have become vicious scalpels that cut across the city, dividing it into a series of unrelated fragments (Jacobs, 1965). Ignoring the cultural demand of spaces defined by the dwellers, city planners has fragmented the land with sub-divided individual plots.

Though influenced and borrowing elements from Western and classical European styles, the settlement morphology of Dhaka during the late nineteenth and early twentieth century also contained the socio-cultural testament of the society. The thousand-year old morphology of Dhaka is based on two basic urban units - *chouks* (market-squares) and *mahallas* (cluster of houses around a chowk or along a linear street). In social definition, mahallas are internal family enclaves relating to the house, while bazaars are places for external trading activities (Khan, 1983). The courtyard (uthan) was the basic module to arrange functional space within the living space. Traditional Bengali houses are focused towards courtyard (uthan) facilities, which respond to all household and socio-cultural activities. Usually, one courtyard represents one family; multiple courtyards characterize a number of families, extended or joint, residing in one house. An expanding family is reflected in the addition

of courtyards surrounded by similar activities and rooms. Depending on the relation between surrounding families, the courtyards are arranged in different hierarchies to allow activities and interaction in different levels of privacy among women, children and men. Courtyards within family houses are restricted for strangers and entry is allowed only with permission. This courtyard concept helps to formulate different social, civic spaces at various hierarchies depending on the surrounding functions.

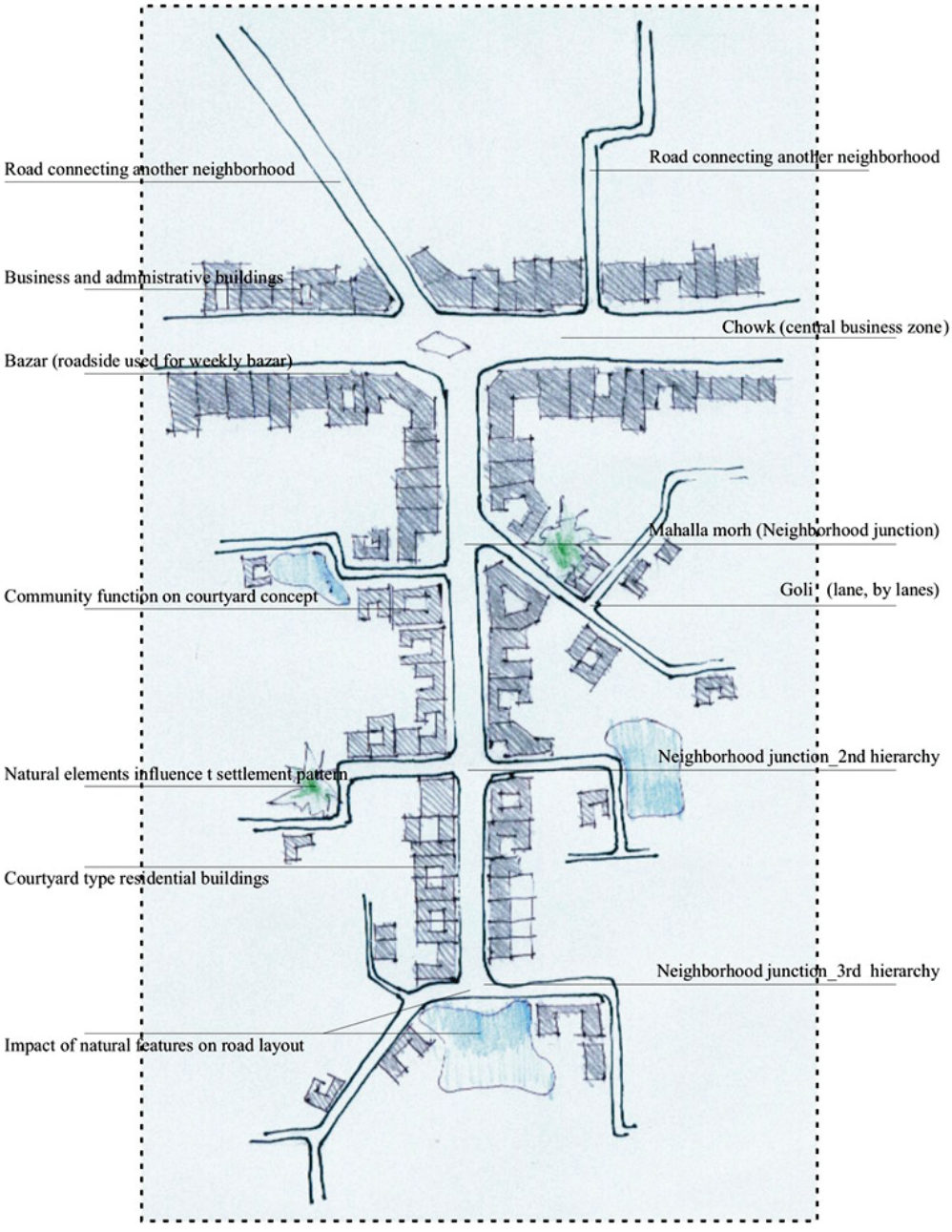


Figure 7:
Indigenous settlement pattern with hierarchical spaces.

Figure 8:
Indigenous courtyard houses provide intimate space for children and women with privacy.

The internal roads collecting the mahallas and ways to the central spine of the bazaar don't follow any designed geometric pattern. Usually the road system follows the natural system of topography and is free to attach to the next neighborhood. On its way to the main artery of an urban unit, it connects various levels of spaces like mahallah gali (lanes, bye lanes), morh (neighborhood round about), chouk (square) and bazaar. These hierarchical spaces depend on the relation between neighborhoods and junction roads. Nodes are usually created at the gathering of two or more roads or the end of lane. Next to the internal uthan (courtyard), the mahallah gali is the gathering space for neighbors especially children who are generally safe from strangers. The next scale and level of spaces are goli, morh and finally the public chouk or bazaar, which allows different levels of social interaction and a common meeting ground for community people. In a mahallah, generally belonging to a particular group, each age and gender group has a domain of its activities, a spontaneous social control is imposed on the behavioral pattern of individuals, and this social dynamics creates different levels of social space ranging from private uthan to public chouk or bazaar (Mowla, 2002). These urban units and spaces become extended with the complexities and density carried by time.

SUPPORT IN FAVOR OF TRADITIONAL SETTINGS FROM THE SUB-CONTINENT

Architect B. V. Doshi, a renowned Indian architect, emphasizes the traditional city to attain contemporary sustainable solutions in the context of the Indian subcontinent. By his own words, "I have observed traditional towns having a capacity to evolve and change in time and space, thanks to the in-built informality in design. I have also attempted to recreate the spatial experiences of traditional towns and cities while reinterpreting the traditional social values which are still valid and cherished by inhabitants in contemporary times."

For example, Jaipur, India combines formal peripheral streets carrying the entire infrastructure and fast-moving traffic with a village-like inner fabric with a variety of clusters, courtyards and meandering pedestrian paths. The streets of Ahmedabad are similar except without the clusters. Quietness and leisure is provided at the same time. The houses are contiguous along the streets creating shaded spaces and locations for people to meet and chat, while lending a character to the built form through the continuity and visual conformity of elements. Gates also help mark the transition between noise and silence, fast and slow movements, and the urban and the rural character.

The proposed plan of Vidyadhar Nagar Housing Project by Doshi in Jaipur, 1984-86 is a judicious amalgamation of traditional town planning principles, contemporary needs and contextual realities. Amenities and infrastructure are designed to serve the needs of four hundred thousand people. The adaptation of the *prastara* plan configuration divides the site into a rectilinear mud structure. The orientation of major streets at 30 degree north of east is to minimize radiation on building facades, and to avoid direct sun during peak hours. The residential development consists of about 15,000 housing units for various income groups, largely as group housing with compact, high density, low-rise built form to ensure land use efficiency. Courtyards and wind shafts help to achieve thermal comfort through passive means. Uses of natural stone, *chajjas* and *zarokhas* not only help improve the microclimate but also recreate the visual experience of the local vernacular. The transition of open spaces from the micro to macro scale is achieved through a network of linear spaces running diagonally through settlements as pedestrian links with interconnected

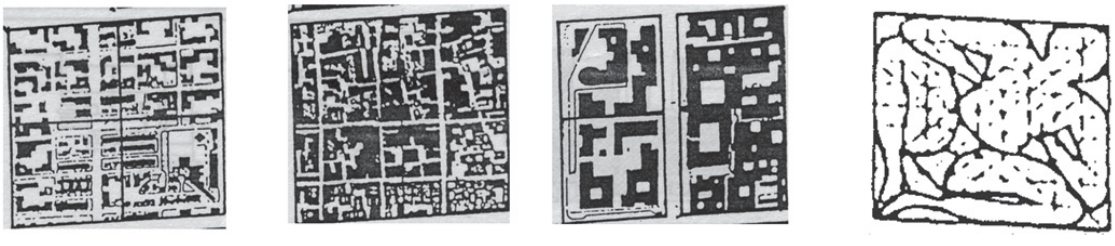


Figure 9:
Plan of the Vidyadhar Nagar following traditional town planning principle (vastupurushamandala).

squares and pathways. Social amenities such as schools, health centers, and playgrounds are provided along the linear open spaces and become mutually complimentary for activities and self-maintenance. The project displays concern for the optimal use of human and material resources, energy consciousness and flexibility for a growing urban fabric. Vidyadhar Nagar is an example of harmonious urbanism with a humane pedestrian scale, a built environment conducive to the lifestyle and an ethos of the place as well as people (Vastu Shilpa Foundation,1997).

GENERATING IDEAS FROM TRADITIONAL SETTINGS

It has been identified from the preceding discussion that Dhaka city is gradually losing open space to move around, especially for younger people who need to be taken in immediate consideration. It is also evident that both the concept and requirement of open spaces in Dhaka are expected to be very different to the concept as defined in the West. Finally, social and cultural demands have been generated that would result in a wealth of material on the social dynamics interfacing with physical environment to adjust to the loss of open spaces in the city. Action plans can be initiated with the aims of 1.Creating locality with a sense of place, 2. Providing a hierarchy of space, 3. Rethinking the road network, 4. Facilitating safe access to open spaces, 5. Road as civic and shopping place, 6. Exploring the spaces between buildings, 7. Creating urban courtyards, 8. Development guided by natural forces.

Creating locality with a sense of place

Create a sense of place within the area by subdividing the area into some identifiable 'Mahallas' or locality.

Inhabitants rarely identify any sense of attachment with their surrounding environment except with the dwelling unit due to the method of subdividing the residential area by individual plots. The dwelling unit, in most of the cases, is a flat (1500 sq.ft. to 2500 sq.ft.) in a multistoried building with no relationship with the ground and other buildings. As a result, one's interaction with other neighbors is limited. This 'placelessness' can be overcome by providing individuality or identity to places and creating a sense of place. Based on the user group, spatial analysis and focusing on accessibility, the living area can be divided into small zones of identifiable localities or mohallas. These Mohallas generally belong to a particular group who have same economic status and will be interactive so each age and gender group will have their own domain of activities. These activities will generate different scales of spaces and community facilities according to each locality following the movement pattern, user volume and activities.

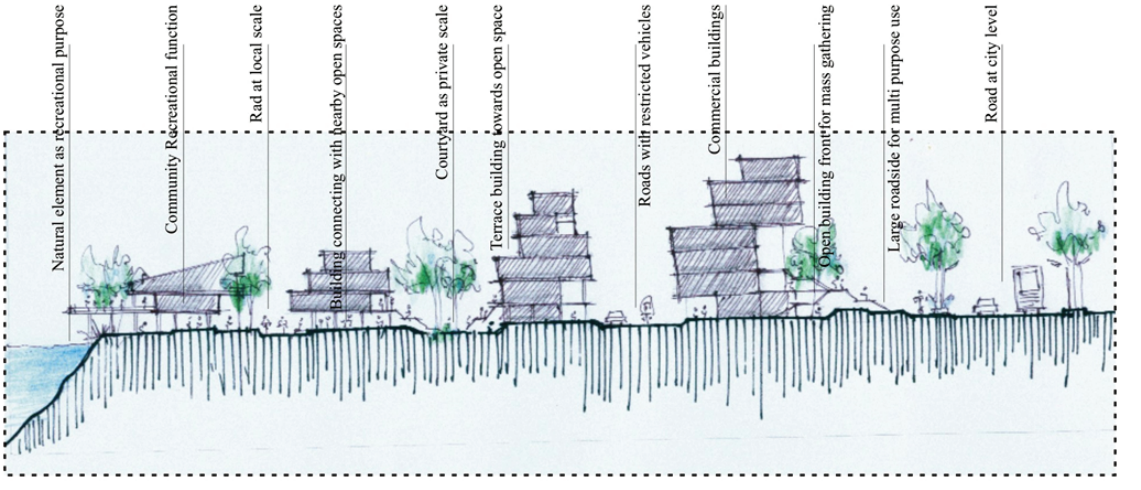


Figure 10:
Spaces designed in different scale from local to city are carefully interconnected.

Providing a hierarchy of space

Create a hierarchy of space on different levels of settlement to ensure gathering and interaction between small age groups and to large city gathering.

In traditional settings, open spaces have a dynamic scale from public gathering in the bazar (chouk), which is accessible by anybody, to internal courtyards (uthan) only for woman and their household activities. There are also semi-public units like by-lanes (mahalla goli), private streets where strangers are restricted to some extent and children are allowed to play and move during a particular time of day. This hierarchy of space needs to be maintained for each mahalla. The uthan (inner court) could be designed by grouping a number of buildings for the very small-scale gathering of children and women requiring privacy. Next to semi-public space combining sub-lanes (mahalla goli), small play grounds, open spaces for inhabitants of a particular locality also allows outsiders in through controlled privacy from nearby mohallas. These semiprivate spaces are within walkable distance. Next public space mahallah morh (chouk) can be placed in between mohallas allowing people from a larger domain.

Rethinking the road network

Emphasize free-flowing road pattern within a natural setting to ensure a hierarchical road network.

The road network in the traditional Bengali setting is quite different form the gridiron pattern. Organic development streets in the traditional pattern are winding by nature, moving here and there, narrowing down at the ends to create the sense of space. The sub-lanes (goli) are less direct and straight to restrict certain vehicular movement. The arterial roads allow fast moving vehicles to serve and connect the locality with the rest of the city. Some of the motorized

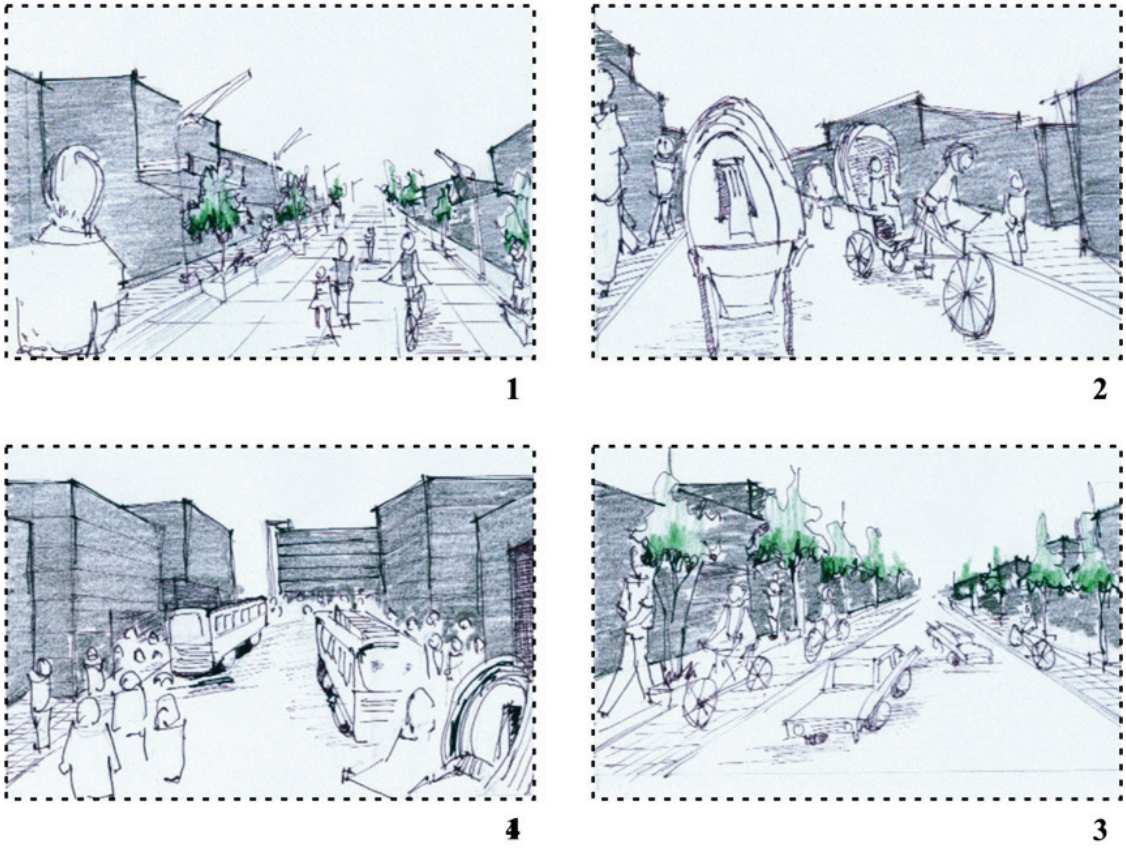


Figure 11:
Roads from small goli (by lane) [1] to central chauk (business road) [4] designed carefully with different hierarchy.

through roads can be targeted into closed-ended local roads minimizing the number of strangers in the locality from distant areas. This would create a landscape for local children to perform play activities in the front streets in the afternoon, as the rate of motorized vehicles would decrease in the local roads. The local roads then can be treated with vehicular access only from one side and the other side becoming a pedestrian node with defined space for the hawker following the traditional chowks (Market-squares, street vendors). Following the chuke bazaars, the hawkers or peddlers can occupy strategic locations such as connecting lanes and sub lanes to attract the customers and provide spaces for inhabitants to move around.

Easy access to open spaces

Facilitate both visual and physical access to the allocated open spaces.

Designed open spaces within a residential environment need to be integrated with visual and physical approaches to ensure accessibility, movement, security both based on their size and access pattern. Spaces for children require safety from strangers. Moreover, open spaces within walkable distance are also essential for elderly people and women for ease of movement. Frequently used accessible public spaces are less vulnerable to illegal encroachment and other transformations hampering the residential living environment.

Roads as civic and shopping places

Making streets more active and un-encroached by civic activities.

The street in addition to being a physical element in the city is also a social space. In the indigenous way of life family activities spread into outdoor areas from internal courts to lanes, by lanes, streets and roads. Indigenous philosophy considers the road as a space for staying in not for moving through (Mowla 2002). Moreover, neighborhood buildings can successfully use streets with different widths, lengths, directions and various in-between spaces for different social activities like community gathering, chatting places for different adge group, street fairs, shopping, roadside cafés, vendor's places, car parking, prayer space etc. It has been observed from present urban practice that less active and less publicly used streets are encroached on by greedy builders. So, more publicly active and well-defined streets might help to prevent unwanted encroachments and can be used for community activities. Roads defined by sidewalls of neighboring buildings with different heights can create a sense of spatial variety. The local roads can be designed to create uninterrupted pedestrian networks, cycling loops, plantings, street furniture for all age group etc. The widened residential streets could have public facilities. Well-segregated and dedicated streets can be effectively used for public activities besides traffic such as low- speed vehicles, sidewalks, plantings, seating arrangements and space for multipurpose use.

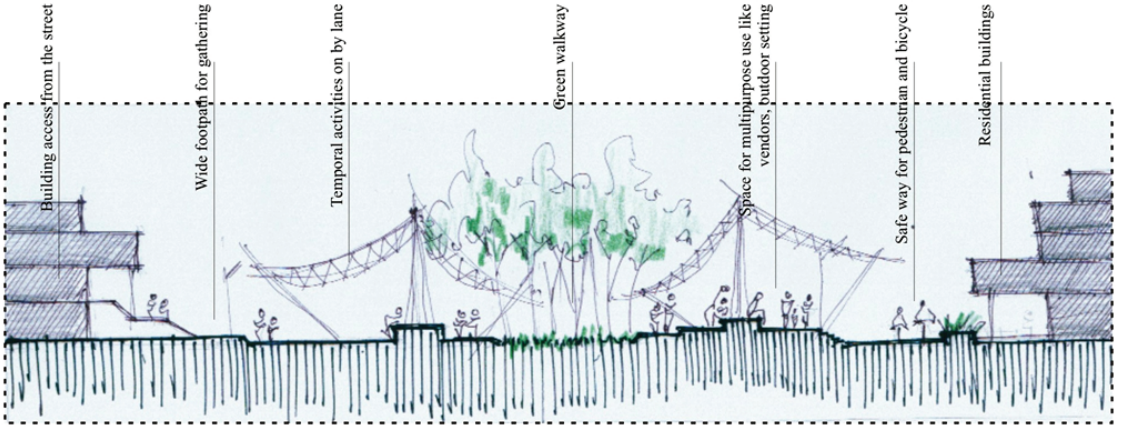


Figure 12:
Pathway in the local level with several outdoor facilities for the neighbors.

Exploring the spaces between buildings

Make the area more legible to inhabitants by bringing the interstitial open spaces within the visual field and implementing communal security.

Interstitial spaces that are a direct product of building bylaws, act as left over spaces with little use. The percentage of such spaces is not so small (more than 30% of plot areas). New building rules should create a scope for rethinking the interstitial spaces more effectively. Access to the buildings can be interconnected and common facilities for children can be provided in these spaces considering their connectivity and visual linkages. The collected setback areas might create open courts for surrounding buildings and be used by children and women with some privacy like the uthan (internal court) in the traditional rural house.

Creating urban courtyards

Utilize courtyards in the formation of community and civic spaces with hierarchical differentiation.

In traditional settlements, the requirement for openness and environmental considerations encouraged various household and social activities in outdoor space. This necessity led to the creation of courtyard spaces within living units. Courtyard spaces can essentially infiltrate present settlement patterns at different scales to ensure various types of social gathering. Besides individual units, courtyards within groups of buildings of a neighborhood will create the opportunity for social exchange. Moreover, courtyard spaces within different civic functions located at important junctions of a neighborhood will generate spaces for different age groups with certain levels of privacy. Courtyards, of course, ensure space for social interaction and communication. This type of space at a large scale between a group of neighborhoods will help to provide an arena for the exchange of views between members of a larger community. The hierarchical distribution of courtyard spaces from single family to city level will strengthen the social bonding through direct interaction.

Development guided by natural forces

Follow the natural forces and their nature of flow to develop a livable city.

The indigenous settlement typology is informal and uncertain. Roads move freely following the slope of the land, topography and natural forces. Settlement took place on the safe higher ground without random grabbing of land. As a result, the footprint of traditional settlement layouts is fluid, giving space for natural forces like water bodies, plantations and old structures. Land developers should, again, follow this development technique. Naturally, the Dhaka region is gifted with various

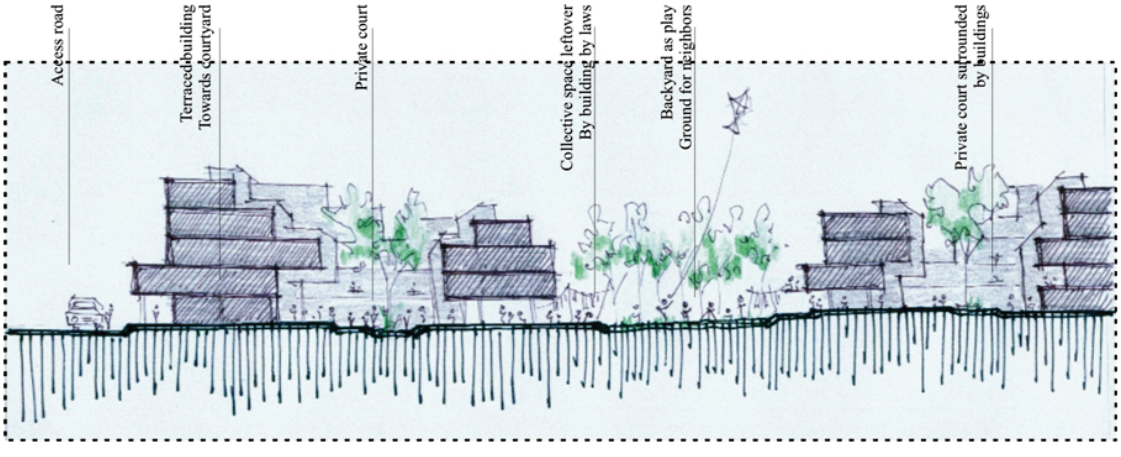


Figure 13:
Court type concept for group of buildings and successful use of backyards created by building by laws.

geological features – a great river, lowland, wetlands and greeneries. Future settlements need to address the original flow and nature of these environmental forces and then respect them when designing for development. At present, the commercial builders ignore these natural forces and generate settlement patterns by subdividing plots without any hierarchy. Consequently, several natural disasters predominate like urban flooding, water logging, and total environmental degradation. Giving space for nature is essential to tackle these environmental hazards. The traditional way of preparing ground for development will of course ensure a livable city by creating spaces within a natural setting. Arrange various community facilities around these natural forces at different scales from small neighborhood centers to large urban cores. This will successfully ensure their place in the modern urban setting.

CONCLUSION

The spatial structure of a living environment is a product of social, economic, cultural, political and religious forces. These forces act simultaneously to create and reshape new urban forms and spaces. There are standards, theories and emerging concepts concerning the urban living environment and housing quality. But the reality of the living environment in Dhaka, as recognized generally, is yet to be favorable. The city planning authorities are more concerned to accommodate a growing population rather than a livable environment. Moreover, achieving density is given more priority than context, traditional demands and cultural forces. Although planning authorities are interested in implementing formal patterns in area design, the indigenous pattern reflects social values more specifically. A settlement pattern influenced from the local context is more concerned with accommodating people from different groups in different scales of space according their cultural demands. It is of paramount importance to understand and integrate urban design and the social demands that derive from the dynamics of local culture. Investigating the basic organizing principles of traditional settlement, formulating the testified design solutions from indigenous uniqueness and bringing them under a formal city planning framework would help to generate a sustainable, vigorous and livable city.

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