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A REVIEW ON EXPLORING THE CHARACTERISTICS OF NEIGHBOURHOOD SPACES IN RESIDENTIAL ENVIRONMENTS: CASE STUDY OF INDIAN HOUSING PROJECTS

***Ar. Shanta Pragyan Dash*[1],**
Assistant Professor- Senior Scale
Manipal School of Architecture & Planning, Manipal, Karnataka.
Email ID: dashshanta5@gmail.com

***Dr. Dibya Jivan Pati*[2]**
Assistant Professor, School of Architecture,
GITAM Deemed to be University, Visakhapatnam, Andhra Pradesh.
Email ID: djarchitect16@gmail.com

ABSTRACT
Several researchers established the importance of open, unbuilt residential community spaces. Using a complex nomenclature in various ways, these areas are critical in contemporary planning practice, frequently neglected and treated as leftovers. With their usefulness in the Indian context of socially engaged and sometimes intrusive communities, these spaces are gradually losing their position in today's residential environments due to pressure to provide mass migration patterns to the rapidly rising population. Due to their inherent order and dignity, these public spaces that offer residents physical, psychological, and perceptual comfort were present in historically developed Indian cities. Many new housing projects by renowned designers have also used well-designed neighbourhood architecture features. This work is a comparative analysis of three selected projects aimed at improving appropriate methods for contemporary Indian history and achieving neighbourhood comfort and resident sense of belonging. It concludes with a set of design guidelines after analysing these case studies which shall be applicable solutions to physical, perceptive, psychological and social problems in the present context in neighbourhood residential environments.

Keywords: contemporary planning, Indian context, neighbourhood comfort, migration patterns, public spaces, residential environments.

INTRODUCTION
Neighbourhood areas are developed, opened or semi-open areas according to the designs that serve as meeting places, community interactions and other events. The rest of the building form, which in many ways constitute essential living spaces with diverse nomenclature in different contexts, are required but often disregarded and designated.
Many researchers have stressed that these residential areas are essential to the community's overall comfort and development. In the Indian context, these areas are important as they live, play, work and worship in an informal arrangement of spaces in socially engaged and sometimes intrusive societies for years. This sense of harmony and ownership in traditional cities is preserved due to their authenticity by many

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spontaneously generated suburbs. But the growing population combined with mass migration trends and the lack of concern by the builders, do not create such environments for newest housing projects, especially in small towns.

Therefore, the residents look for physical, emotional and perceptive comfort. Some of these ventures have taken the values of the well-designed communities into account by famous architects of the world. Three of these projects were selected for detailed review in order to find effective ways of ensuring an agreeable residential environment, especially in the Indian context.

EVOLUTION AND CONCEPTUALIZATION OF THE NEIGHBORHOOD UNIT

A neighbourhood can be defined as a "area surrounding a place; person or entity" (Oxford, 2012, 482). A public space means unbuilt, accessible or semi-open spaces in consonance with planned spaces. A residential neighbourhood is typically a dense set of housing units that can be built, multi-story, rowed, or clustered in addition to similar facilities such as retail, manufacturing, and convenient shopping areas. Living in a particular community unit includes infrastructural facilities and services. Therefore, besides open spaces, semi-open spaces are left to discharge these operations smoothly. These spaces may have different nomenclatures.

While known in traditional settlements as streets, squares and transition areas, they constitute vehicular roads, pedestrian paths, open green parks, road widening setbacks, and parking lots in modern developments. Generally, these public spaces have been considered a critical part of the development of neighbourhoods and intrinsically open spaces, including green areas such as parks and playgrounds, service fields, paths, walks, private gardens and parking spaces to be used and enjoyed (Untermann and Small, 1977, The Compact Oxford Reference Dictionary, 2001).

METHODOLOGY:

The research attempts to study the various attributes of contemporary Indian housing and the absence of neighbourhood spaces through various literatures studies. It also analyses the factors influencing comfort in neighbourhood spaces. It also added to study the various aspect with description of residential communities through past history through an insight of traditional Indian cities along with post-independence design approaches.

Using the Descriptive Analytical Approach, general principles of quality of life, sustainable growth, and urban quality of life is studied. Moreover, the study explores the ideas and methods of modern urban planning developed in various case studies to improve the quality of life. The urban standard of life in a neighbourhood has been analysed from this study. The three selected schemes, GSFC Housing at B.V. Doshi at Vadodara Raj Rewal's Asian Games Village at New Delhi, and Charles Correa's Belapur Housing at Navi Mumbai, were designed by eminent architects responsive to residents 'indoor and outdoor needs are studied. The philosophies of these architects and their underlying principles are summarized and deduced into design guidelines applied in the

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design of a proposed residential neighbourhood at Bhubaneshwar: City of temples which attempted to retain and value the context, culture, social cohesion aspects with their spatial hierarchies.

PRECEDENTS IN THE INDIAN CONTEXT AND CONTEMPORARY APPLICABILITY

Neighbourhood had been a much-deliberated research subject from as early as Jacobs (1961) call, which considered social settings around homes, to Appleyard (1981) establishing the comfort of living streets as safe and healthy places for playing and learning in residential environments. Other studies include Newman's (1972) search for defensible spaces in residential environments; Lynch (1981) theory of a good city with five-dimensional settlements (vitality; sustenance; psychological, social and physical safety; and consonance); and Marcus and Sarkissian (1986) emphasize child-friendly spaces in setting goals for a built environment. The above works were critical in reiterating the importance of residential neighbourhood spaces.

Similarly, Gehl (1987) examined spatial usage dependency between buildings on their proportions, Hillier (1996) spatial configuration theory, Bonaiuto et al. (1999) sense of belonging observation as a significant factor in group satisfaction, and Taylor and Harrell (1996) asserted residents 'preference for an environment based on social conditions in addition to safety and security. Moreover, recent Oktay and Rustemli (2010) and Rashid et al. (2013) work reiterated the value of group cohesion in suburban environments.

The functional qualities of these spaces were well demonstrated in different settings by the above-mentioned researchers, who highlighted the need for small, supervised spaces for infants; large grounds for teenagers; and non-hazardous traffic-free areas to explore, relax, and conduct various-scale social activities. Nonetheless, a satisfactory community atmosphere is not only about functionally efficient areas; it also depends on safe, well-designed spaces for various residential development activities. Studies have reported that the physical structure of an environment inherently affects human perception and behaviour. Housing is where people spend time consciously or subconsciously. It should be designed for outstanding comfort and relaxation for the well-being of residents.

In the Indian context, gratifying community spaces are especially imperative for healthy social growth. Indians may generally be characterized as vociferous, warm-hearted, and vibrant beings that are socially active, even intrusive.

Large extended families living, praying and fasting together are not only ritual indicators, but people share the connection. Due to inherent spatial character and environmental reaction, geographically convenient locations in established suburban residential communities were chosen for routine activities. Over years of living and simultaneous growth, these spaces have acquired intrinsic qualities that endure and extend user groups. Nonetheless, changes have arisen due to migration and other growth-related factors, and in contemporary Indian community behavioural trends a desire for similar comfort, belonging, and identity is increasingly evident.

SCENARIO OF CONTEMPORARY INDIAN HOUSING: THE ABSENCE OF EFFECTIVE NEIGHBOURHOOD SPACES

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India is a fast-developing country where housing has become a major concern due to rising population coupled with increasing urbanization. In pursuit of ample numbers and wide-ranging indifference, contemporary residential developments are not conducive to the well-being of the inhabitants. Inspired to some degree by initial western models, these housing schemes are replicated in small towns, irrespective of their effect on living habits of an evolving Indian society. Taylor and Thapar clarified how "the metaphysics of space and quest for serenity, recurrent themes in Indian architecture, challenge homeless migrants and the frenzied needs of an emerging middle-income consumer society" (Taylor and Thapar, 1992, 26).

Numerous macro-level issues associated with current housing environments include lack of organized open spaces and movement patterns, loss of enclosure and scale, lack of open space adaptability, lack of informal character, indifference to prevailing climatic conditions, and lack of visual relief and spatial character among others. Consequently, in most housing environments, public parks and leisure areas are often unused negative parks rather than intended areas of activity or interaction. This pattern is evident not only in low-income housing, but also in luxury high-end developments; the higher the cost, the lower living spaces. Most contemporary Indian housing projects therefore lack viable public spaces to create a clean, liveable environment.

The above shortcomings are apparent in modern housing projects, which should have constructed individual housing units for efficient area management linked by wide vehicle roads and green spaces. Nevertheless, these rigid and alienating systems show lack of hierarchy from private to public and lack of gradual change, with drastic transformations of spatial enclosure, proportions, and scale. Residents 'comfort level is often ignored. Moreover, open-grid road networks designed to facilitate vehicles build blurred pedestrian thoroughfares. Cars also made these situations risky, even hazardous. Often an overview of the new projects is an overview of the crowded parking lots.

Thus, this lack of existing small-scale community spaces undermined the sense of belonging and even privacy, causing more identity and territoriality loss. Many residents remain impersonal in these unknown areas without a sense of identity, leading to lack of open space maintenance and loss of associated pride among residents. Large open spaces function for scheduled, frequently forced, formal activities, but due to lack of enclosure, scale and inadequacy to tropical Indian climate, they do not facilitate casual, informal and social interaction or community relationships. Moreover, visual and spatial character of most contemporary housing is monotonous and uninteresting. This housing is neither heaven nor earth, resulting in visual relief loss.

FACTORS INFLUENCING COMFORT IN NEIGHBORHOOD SPACES

Spatial quality and adequacy come from human needs in residential environments. Neighbourhood areas delivers comfort and ownership. A complete study and synthesis of current scholarships from Lawrence (1987), Untermann and Small (1977), GLC (1978), Alexander (1977), Lang (1987), Marcus and Sarkissian (1986), and the Vastu-Shilpa Foundation (1988), among others, found that local population satisfaction in a built-up region depends on physical, psychological, social and economic aspects.

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The physical aspects rely primarily on the climatic comfort of open and closed areas, as well as accessibility, convenience and smooth discharge of facilities and transfers from one form to another. Privacy, protection, and territoriality are the psychological needs of citizens. Given its name, visual pleasure and comfort are the most significant characteristics of a person's perceptive home environment requires. People's well-being is also central to social needs such as passive, active interaction modes. All these things lead to a satisfying, stable environment.

Figure 1: Green space within the neighbourhood to influence the microclimate (Source: Author)

- **Physical comfort:** Residents have physical comfort by the climate of neighbourhood spaces and it is imperative to have "comfortable indoor and open living spaces that meet their social needs" (GLC, 54). Temperature, sunshine and wind have to be controlled according to local conditions in the tropical Indian climate. Physical comfort depends on the shape, design and orientation of building blocks and open spaces with respect to sun and prevailing winds. In addition, the comfort conditions of these areas are also enhanced by carefully built landscape, water sources, vegetation and topography (Fig-1).

  Comfort is also an essential aspect of physical comfort accomplished by sufficient accessibility and efficient operation. This requires changes between each other in the housing units and also outside the premises in its immediate area. In this regard issues such as accessibility of cars, quick pedestrian movement and parking are integrated.

Figure 2: Eyes on street: Children tot lot area with each neighbourhood unit with seating space for elders as a part of recreational space (Source: Author)

- **Psychological needs:** Often, residents 'psychological needs are a prime concern in a residential setting. Such provisions cover privacy concerns and mean the physical separation of the public and private spheres to ensure acceptable community ties (Fig-2). Roderick Lawrence defined privacy as a space access control, meaning that no one bothers or is alone, and a "information access monitoring," indicating the overview aspect (Lawrence 1987: 163). This means the data controlling of information. While social interactions and communication with neighbours are important for living, privacy for mental and emotional

Figure 4: View of green space from the dwelling units which has informal relaxing space under tree covers (Source: Author)

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well-being is an essential component(Fig-3). In an otherwise favourable area, interference from neighbours, other tenants or even passers-by may be a danger. This validates the need for a sustainable development between the public and private spheres. Moreover, a significant psychological foundation is the concept of protection in a suburban neighbourhood. Security issues the safety of children and older people from the passage of vehicles and other hazards while maintaining safe and pleasant footpath travel at the same time (Fig. 4). Lawrence clarified notions of territoriality as "possession or protection for that area" in accordance with surveillance (Lawrence 1987, 150). Watching out for each other therefore also provides important psychological needs, particularly in outdoor areas (Fig.5). "The balance between designing for easy monitoring and designing for privacy must therefore be sensitive" (Marcus, 1986, 271).

Figure 5: Visual perception to children's' play gives sensory relaxation (Source: Author)

Figure 6: Active green street in the neighbourhood with dedicated pedestrian access and ground floor commercial activities for social interaction (Source: Author)

- **Perceptual needs:** Moreover, residents 'primary perceptual need from their living environment is uniqueness or distinct identification within the dwelling unit prototype amount. Contemporary housing with similarly built spaces and dwelling units will provide for shaping individual and group spaces of residents based on their preferences and requirements. Residents will feel happiness and pride. Additionally, visual feedback and relaxation from the physical environment is a significant contributing factor to the inhabitants 'sensory relaxation (Fig. 6). The need for spaces that give rise to excitement and anticipation can be fulfilled by creating interesting numbers, avoiding monotony in building blocks and street facades, effectively negotiating with the sky and the land, and varying visual experiences in a residential setting.
- **Social needs:** Social needs are also important to the well-being of the person. "The hidden truth of man is that he needs to be confirmed in his being and life by fellow people not only in his

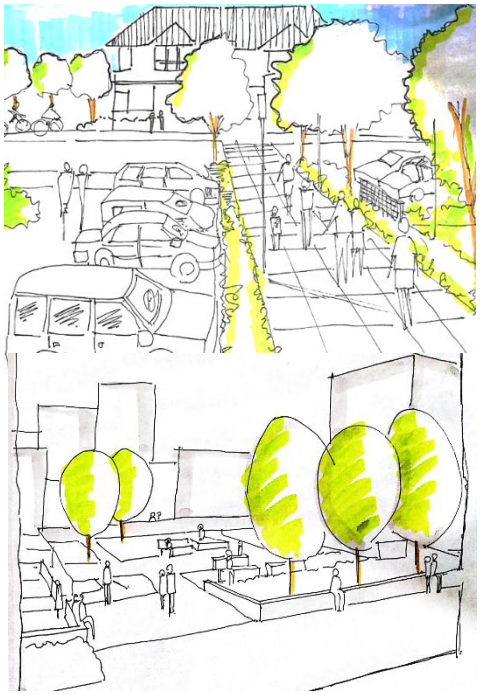

Figure 8: Integration of open and built up space within the built environment for healthy interaction (Source: Author)

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house but even in the context of neighbourly interactions "(Alexander, 1977, 94). Interactions with other beings satisfy human identity and belonging needs while promoting the growth of individuals and reducing depression. Such cohesion and interactions, which are considered to be significant in the Indian context, should be fostered in desirable neighbourhood areas. However, "social interactions arise more easily when a sense of individual autonomy, whether through reserve or territorial force, meets people's social needs" (Lang, 1987, 160). Variables that affect social interactions in a residential area include proximity and orientation of housing units to one another, their location and open space arrangements, and their access to streets and community spaces (Fig. 7). As a condensation of the factors listed above, while physical needs are addressed by climate-friendly and healthy community spaces, their privacy, protection and territoriality address psychological needs. Perceptual expectations can be fulfilled by individual identity, visual variety and comfort, whereas social needs require informal contact (Fig. 8).

Nonetheless, in the sense of this analysis, the variables associated with all of the above should be amalgamated as their combined impact contributes to a satisfying and stable residential environment. On the juxtaposition of these dimensions, the factors that influence the physical, perceptual and psychological comfort conditions of a community within a residential setting are the spatial arrangement and relationship of housing units with each other in terms of the location and their transfer from public to private areas, and vice versa. In addition, physical access to the location, the flow of traffic, the separation of vehicle and pedestrian lanes and the linking of open spaces (Fig. 6) with regard to traffic decide ease, accessibility and orientation. However, the physical comfort of the surrounding areas is further dependent on the reactions of the adjacent built environment to the macro-and micro-climate conditions, such as the sun's position, the prevailing wind direction, the water sources, the vegetation and the topography of the site. Factors that influence the understanding and psychological comfort of these public spaces include their spatial hierarchy, enclosure and accessibility, size and volume, and the effect of the built mass character on open space. Aspects that define the accessibility of these spaces include the relationship between the built form and open spaces, the treatment of building edge, the location of common areas, and their connections.

AN INSIGHT OF NEIGHBOURHOOD SPACES IN TRADITIONAL INDIAN CITIES THROUGH HISTORY

Ancient and medieval history suggests that the creation of villages or settlements, also in primitive societies, is based on grouping individual dwelling units into groups to enclose a collective space and associated small interaction spaces. Such towns have expanded, and houses have been further withdrawn from large public spaces as the populations grow. Secondary community spaces have been built in the form of roads or streets leading to the key interaction areas. Later, due to urbanization, some cities became concentrated population centres, and preconceived thought was required to plan these urbanized cities. Thus, "the informal trend of gradual development has contributed to more formal

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large-scale preconceptions of the overall city structure" (Untermann and Low, 1977, 3). The entire city began to be designed in a rectilinear grid pattern, which led to blocks and clusters from which settlements had begun to be ruled by the rigidity of the structure (Fig.9). Throughout the cycle, organic, self-designed community spaces have been turned into non-flexible areas controlled by the rigidity of the building forms.

With the emergence of industrial revolution and advanced technology, new technologies and innovations modified the language of built types. In addition, devastation as a result of world wars demanded multiple housing projects in a limited period of time, and unwarranted migration to cities provided less land for development. As a result, large residential buildings, walk-ups and apartments were experiencing a spurt in growth. As a result, users moved further up from the ground, and their contact with the ground became minimal. The increased lack of awareness of planners to open areas has led public spaces to become pure spaces left over in compliance with the legislation and by-laws on movement and ventilation.

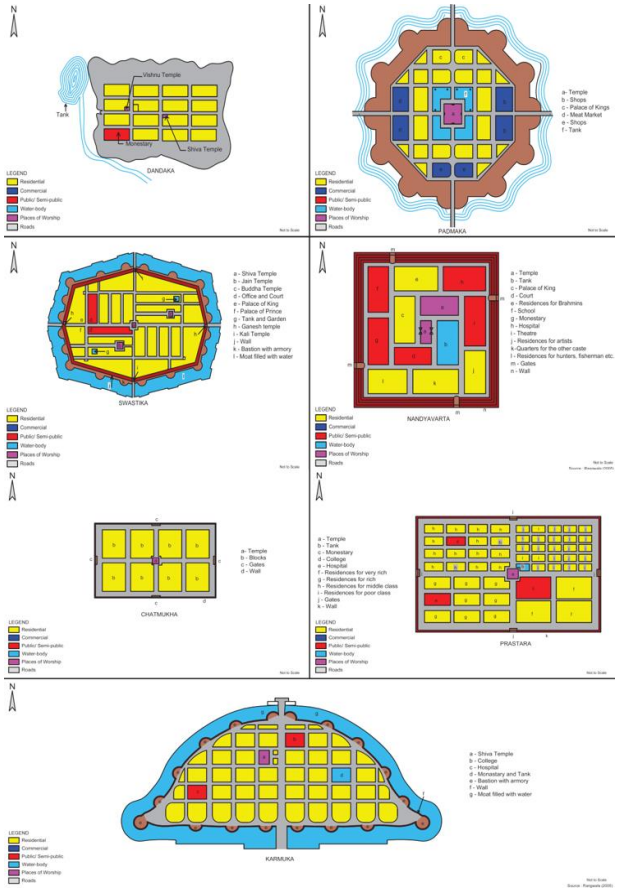

Figure 9: Pattern of Towns in Ancient India (Source: Pradyumna Prasad Karan: The Pattern of Indian Towns: A Study in Urban Morphology)

In the Indian subcontinent, a definite answer to neighbourhood spaces has been witnessed since Mohenjo-Daro and Harappa's primordial civilizations to the spontaneously formed cities of Varanasi, Jodhpur Ahmedabad, and Lucknow. In neighbourhood spaces, hierarchy, continuity and space character were evident and space complementary. In the traditional Indian system, regional segregation was initially defined by caste groups and occupations. Structure of society shaped the division into villages, hamlets or streets of caste classes. For several years' people have been living together on the basis of caste, religion and occupation, meaning that humans have to live in a familiar climate.

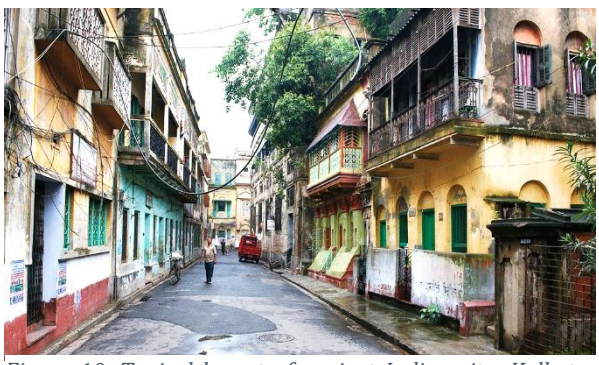

Figure 10: Typical layout of ancient Indian city: Kolkata-cluster housing, overlooking streets, dispersion of terraces (Source: T Magazine Blog: The New York Times)

"Indian cities were characterized by the cluster of houses, each side by side with balconies overlooking streets, courtyards with public space and a dispersion of

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terraces that permit a further set of activities within the property. Houses had private as well as public space, but it was very different in many respects from the changing cities of our day (Fig.10). "(Taylor and Thapar 1992, 21). A spontaneous and organic organisation of roaming streets and informal laying of forms is the religious city of Varanasi on river Ganges. At junctions and other locations, the narrow lanes stretch into squares (Fig.11). This hierarchical networking encourages movement and stops at main nodes, namely those squares, which have the size, proportion and comfort to improve the activities. In an informal pattern the two to three-storey courtyard dwelling units naturally face hierarchical streets and provide an intimate sense of community. Therefore, in narrow areas, opposing neighbours may interact. In the transformation from the Aangan (courtyard) to the Deodhi (external platform), then the gulli (street) to the informal places, incremental dispensation of space from inside to outside is evident.

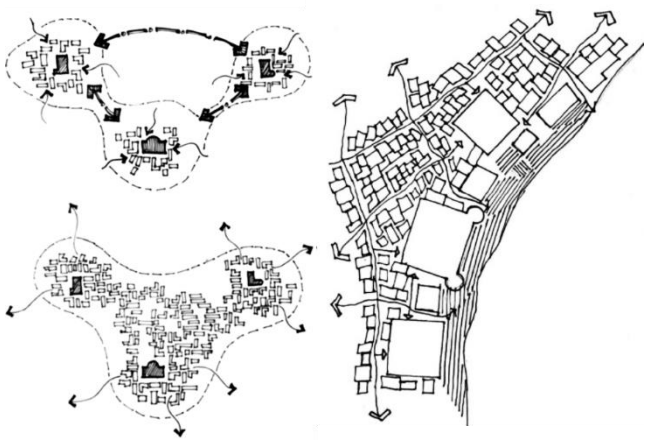

Figure 11: Layout of Varanasi City: narrow lanes stretch into squares (Source: Animesh Dev, Modernity: A Way of Urbanism -- Banaras in Indigenous Trans-Formations)

Likewise, a cycle of additive growth has also resulted for Ahmedabad, a medieval city in Gujarat, India. This was settled by refugees during the 16th and 17th century economic revolutions, and was influenced by culture and background. Security and protection were major concerns, splitting the walled city into puras and then pols. Ahmedabad resembles a labyrinth of twisting narrow streets, creating a network of community-based micro neighbourhoods (Fig. 12). Restricted vehicle access through established gateways gives residents independence, territoriality and protection. A natural hierarchy from the courtyard to the otla, street and squares enables the transition from private to public spaces. Varied spatial enclosure, judicious mix of solids and voids, and climatic suitability provide visual diversity and comfort in these pol ecosystems 'neighbourhoods.

Figure 12: Ahmedabad city layout: Twisting narrow streets, varied spatial enclosures (Source: Vinay Shah- Street development: case of Ahmedabad)

Jodhpur, a geomorphic city of Rajasthan, revealing itself in terrain patterns, is built on a stringent caste

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system with layers that house various caste groups built on their status and location on the fort. City clustered dwellings reveal a tight-knit group that wants to be tight to members of the same caste and exchange considerably that an outsider may feel annoyance or resentment in their territories. Dwelling units, which are essentially variants of courtyard houses, open up to streets with a good sense of privacy and land (Fig. 13). The transition from dwelling to outside is a veranda with a high plinth blurring the division of outside and inside and forming the never-ending connection to the entire city's land. At junctions, streets grow into broad structures and commercial areas, creating a typical hierarchical movement with clear underlying spatial hierarchy. The tight interwoven cloth, meanwhile, creates enclosure in these gated housing communities where human size is often valued and human comfort is uncompromising.

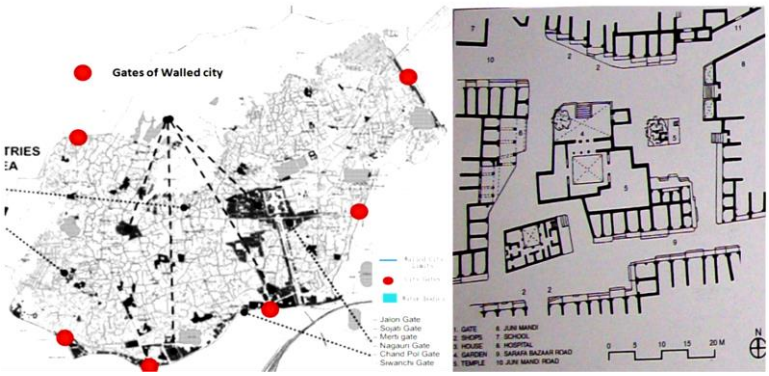

Figure 13: Jodhpur Walled City Layout-Open up Streets, Courtyard houses, transition from dwelling to outside (Source: Kallakirti, 2011, Land Use Transformation – Problems &Prospects, A case of Walled City, Jodhpur, MNIT Jaipur)

POST-INDEPENDENT INDIAN HOUSING: MANY RESPONSIVE APPROACHES OF NEIGHBOURHOOD SPACES IN RESIDENTIAL DESIGN

India's contemporary housing model has long been envisaged. With no land dearth and few inhabitants, large standalone bungalows accommodated the rich, while commoners lived together in single- or double-story settlements (as the structure allowed). The first appearance of multi-floor apartments was traced back to 1911 when British rulers established it as their capital. However, in the 1950s, the Central Public Works Agency, responsible for large-scale housing programs, allocated many multi-level housing units with minimal amenities to the massive migrant population from post-independent partition. Such dwelling units 'correlation with their neighbourhood history was not even considered appropriate as they concentrated on their ever-deficient numbers.

In the early 1950s, diverse planning authorities were tasked with overseeing housing development in major cities, leading to increased sensitivity in some residential architecture. Architects partnered with industrialists on neighbourhood-oriented housing schemes. The Atira Low-Cost Housing, designed as a village with numerous community spaces, was unique in its design. At the same time, visionary architects designed several other projects, many of which remained unbuilt. In the 1960s and 1970s, GSFC Housing pioneered some insightful approaches at Vadodara, Delhi's French Embassy Quarters, followed by ECIL Housing at Hyderabad and Kota Rajasthan's Cablenager Township; these were townships that set the stage for more welcoming communities.

Due to its conceptualization as an urban village with implied hierarchical structures, the successful completion of Yamuna Apartments as a cooperative collective housing scheme

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in Delhi in 1981 (Fig. 14) crossed a milestone, that is, distinguishing itself from other urban housing projects. Aranya Housing at Indore, which includes a complex matrix of varied income groups, responded well to human scale (Fig. 15). Sheik Sarai Housing and Asian Games Town, New Delhi (1983) set new criteria for residential society. Furthering the cause of low-rise high-density housing, the Belapur Incremental Scheme (1985), which created hierarchical open courts based on equity, was crucial in restoring the importance of neighbourhood-responsive ecosystems. The millennium's end brought wider deliberation for the unbuilt, while most power-powered builders and promoters favoured wealth sales. Jal Vayu Vihar Bangalore tried to address issues of size, territoriality, informality and interaction. Cidco Housing at Belapur Mumbai had varying degrees of casual loan enclosures. Udayan Housing Kolkata displayed impressive climate-responsive community spaces as Laburnum Gurgaon introduced inward-looking hierarchical spaces conducive to interaction. Vertical neighbourhoods were developed in Sumeru Apartments, Mumbai, while Gharkul Khargar (also in Mumbai) provided its own territory open spaces. Only planning officials realized the importance of neighbourhood-sensitive areas and began prioritizing the design proposals.

Figure 14: Yamuna Apartments (Source: The Design Group - Yamuna Apartments (1981), Alaknanda in southeast Delhi)

Figure 15: Aranya Housing Complex- Indore (Source: Ryan Waddoupsa-Look Back at Bal Krishna Doshi's Best-Known Buildings)

ANALYZING SELECTED CASE STUDIES

The three examples chosen are GSFC housing in Vadodara, Asian Games Village, New Delhi, and Belapur in Mumbai for a detailed study of community space responses in a residential environment. All three examples reflect different national middle-income groups, which are avant-garde approaches to tackle problems from established economies to neighbourhoods (Fig. 16). As feats of contemporary Indian architects, designs of built spaces were targeted as an integral part of their urban environments, offering significant comfortable and usable spaces to their residents.

Constructed as an autonomous town on a 140-acre site, Vadodara GSFC Housing consists of 1800 housing units designed for the town. "Inspired by traditional Indian lifestyle, design reacts to overlapping uses of Indian life addressing the scale aspect required to communicate in a housing system. Doshi also reveals his fascination with the climatic and

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social features of typical courtyards and gates of ancient Indian cities" (Curtis, 1988, 68). In contrast, New Delhi's Asian Games Village was built on a 32-acre site comprising 700 housing units centred on urban streets and enclosures. The entire complex has two-to-three-story buildings with 11 distinctly constructed dwellings.

Figure 16: Layout Plan of selected Case studies (Image Courtesy: Ritu Gulati- Neighbourhood spaces in residential environments)

Moniteur described its architecture as recreating North Indian traditional urban morphology by "mohalla," rendering it a series of spaces interwoven with narrow shaded pedestrian streets. [Moniteur's, 1985].

Though Charles Correa's main characteristic of Belapur's incremental housing was the spatial hierarchy inherent in our traditional Indian system. This low-rise high-density housing scheme comprising 550 units constructed on 13.3 acres exhibits a broad spatial hierarchy ranging from individual homes to community sites, with the largest public space being the median where primary schools and other similar facilities were situated. To deduce conclusive criteria, all three projects were evaluated in depth based on established factors impacting various levels of comfort and satisfaction. Selected cases were investigated for their spatial layout, building blocking, street façade and character, as well as approach and movement systems. Additionally, the spatial hierarchy of public spaces, their degree of enclosure and accessibility, articulation of built edges, and reaction to current climatic conditions are analysed to determine their effectiveness in providing comfort and satisfaction to residents.

Spatial layout in a housing environment as one of the most significant attributes includes site-related arrangement of residential units, streets, and open spaces. This also determines the unit's connection to surroundings and subsequent use by occupants. Renowned author Christopher Alexander believed that "people are different, and how they want to place their homes in a neighbourhood is one of the most fundamental types of variation" (Alexander, 1977, 193). Therefore, unit site and community area location defines their degree of social interaction and growth. However, results suggested that the total number of units in a residential setting should be divided almost evenly into the isolated quiet zone, middle activity area, activity centre and busy streets. The transition from built to its immediate surroundings, however, is also significant and should be investigated as it produces the desired level of activity.

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The cartographies suggest that residential space organizations are semi-extraverted, clustered and looped on a peripheral road in the Asian Games Village concentrating on a nearly central community area. Meanwhile it has interpreted the hierarchy of the spatial structure of the Belapur Housing Units. Internal systems are linked through hierarchical open spaces in central communities in the vicinity of the current nallah. It splits the site almost entirely. Across all three clusters of units, multiple squares and streets are clearly linked. However, it is because the units are pushed in linearly. The relationship at the Asian Games Village. Along a geometric course, intimate roads and courts on the back of the street, GSFC linear units can be accessed. At Belapur, there are identical findings for the clustered hierarchical structure. However, the change from units to immediate open spaces is sequential in the Asia Games Village and GSFC. This takes you to the front across a courtyard. In the meantime, the Belapur personal court is decentralized courts hierarchical.

In addition to the spatial structure, the built mass and the streetscape style provide a fascinating visual dimension in the surroundings of a living community. In order to avoid discontinuation, variance, redundant or even monotonous residential area must be properly blocked, façade regulated and negotiated with the sky and land. This also activates human dimensions and proportions, thus addressing personality, physical structure and visual relief problems. A suitable street character in the neighbourhood needs to be created. The study of 3 cases showed that, due to its stringed walls, planned balconies and terraces, the masses constructed in the Asian Games Village represent a fascinating game of solids and vacuums. The Belapur hilltop contrasts with the soft, sloping terrain.

In fact, the various hills of the Asian House tend to break the monotony into the sky; however, the human side is naturally affected in some instances. At GSFC, the emphasis will be on orientation and direction by using a large central tank containing high trees, hence a room ceiling and an adequate human dimension. The path that alternates in Belapur Home offers a complex landscape that is also compatible with human size and dimensions. The regional characteristics and uniqueness of Asian housing are seen in windows, door colours and related materials. GSFC's role is the same as roads from one unit to the other. Incrementalism gives territoriality and particularity to the housing of Belapur, whereas the same materials and colour tackle the same standard. The simultaneous motion of cars and footpaths is also an important activity for the neighbourhoods' surroundings. This function involves the distribution and segregation of roads at the premises, the conversion from external main roads to small walks. "Football is unsafe in the field, but accidents impair the driving of cars and footballers" (Alexander, 1977, 271) Alexander points to rightly.

Therefore, optimal interactions between vehicles and pedestrian movement are required to ensure that the feet are safe and easy to use. Furthermore, a move device must be mounted, removed, screened and designed into the building. Research has shown that, inside a parking area of not more than 9 percent of the total area, a small vision-screen pocket with interconnected residential areas must be arranged in the best possible comfort. Both properties are within 35 m of desirable distances.

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Grid output is often determined by the distance, movement and visual properties of the movement and edge treatment.

The peripheral path is the direct periphery of the spinal cord in the Asian Games Village and the quick transition from the external path is perpendicular. With current road networks, the GSFC Housing can do the same by separating a perimeter circuit of housing and highway networks, which end in a stalemate. The Belapur Housing then prevents entry into a hierarchical network that leads to tiny deacons in a peripheral backbone in the parks. The three residential areas are totally free and raise the distance between the car park and the entrance at the same time. However, the roads are low, with wide curves, narrow entrances and reduced visibility. This raises vehicle speeds and allows the vegetation and terrain around them to suit. Doorways and road widths between vehicles and footpaths can be found in the Asian Games Village. The second perpendicular orthogonal vehicle network provides ample common space and transfers for GSFC turf. Belapur Housing has a separate car and foot path by restricting vehicle access and making hierarchical accessible pathways which, in some instances, increase the distance to walk. Both of the cases contains well-distributed car parks with less than 10 percent allocation although the difference is much higher between parking areas in Belapur.

- **Spatial hierarchy and enclosure**

The hierarchy of open space is a geared transition from smaller to larger spaces, as a result of their usefulness and scale, or vice versa, without intervention. In addition, "outdoor people always seek to find a spot where they are able to cover their faces, and to look outside on a wider window" (Alexander, 1977, 558). The residential area opens into the wide open spaces of the residential quarter, a street or a square that forms a backdrop for other areas, leading to public plazas or pastures. 'The small spaces may also stand against larger competitive spaces. In designing the medium density, contrast is fundamental: defining the different fields' (Untermann and Small, 1977, 227). In open spaces where there is a normal difference between the public and private spheres, there is an equality within Asians Games Village because of the distinction between streets and squares and small and large courts. In GSFC, private courts closely connected to the courts deliver small, expansive court views and the largest spaces. Belapur' s spatial hierarchy is most evident, where small private courts open to large courts and then public spaces.

In addition to hierarchy, adequate spatial enclosure is required to stimulate human spaces. The space qualities of each area, large or small, low or high, broad or narrow, have distinctive traits in terms of sensations and reactions to the human being (Greater London Council GLC and Civic Architecture, 1978). The key characteristic that creates the sense of intimacy, safety and significance of the resident's territory is its level of room and accessibility. It neither should be totally loose nor locked rigidly. This can only be partly surrounded by roads or partly connect to other areas (Grand London Council GLC and the Department of Architecture and Civic Design, 1978). The number of enclosures is the most important in the Asian Games Village. The area in the residential community offers a clear sense of place, privacy and the region which promotes neighbourhood surveillance and social interaction and thus reduces vandalism. Throughout the design of

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a cabinet, primary components are predominantly used, while secondary objects, including landscape, reinforce the cabinets and softly.

At GSFC Housing, dwelling streets lead the tightly enclosed intimate courts to rear open greens providing hundred-foot views. As such, enclosure meaning is retained. Many places use secondary elements like trees, windows, and boundary walls to enhance the impression of enclosure. Belapur Housing describes open space spatial relationships well. Particularly, the narrow, highly enclosed spaces between units contrast with wide, open, semi-enclosed areas, creating identification and interest. Moreover, the shift from private to public is highly hierarchical with the enclosing elements being predominantly secondary in the transition to open space.

- **Scale, proportion, and character of built edges**

'Quantitative connections between actual dimensions in a structure or room, while scale refers to how the size of a building element or room is perceived in relation to certain items (Ching, 1979, 296). The proportion and scale of the enclosures and the human influence of the built environment specifically define comfort in open environments. Furthermore, there are different sizes and proportions of all forms, including streets, squares, transition areas and large public areas, which trigger varying feelings of protection, anonymity, interaction and territoriality (Fig. 17). As shown by a GLC study (1978) a linear height-to-width ratio of spaces can range from 1:1 to 1:2,5. One or more of this ratio will make space either claustrophobic or small. In his book Site Planning Lynch and Hack claimed that when their walls are half to one-third wider than the area enclosed, an external enclosure is most comfortable and the area is no longer contiguous when the ratio of the enclosure is below one-fourth"(Lynch and Hack, 1984, 158).

- **Neighbourhood response to climatic factors primarily sun path**

Heat is a major problem in tropical climates, particularly outside areas, where the location of sun, wind and light at various times of day and year dictates comfort. In the Indian context, semi-designed and unbuilt spaces in suburban environments are important because the different types of construction in mild to hot climates open up numerous enclosures in contrast to the cool climate of the West. When one steps out of the built form, it opens up for a veranda leading to a patio, a tree to a terrace, etc. (Khan, 1987) Via collective shade in small wind-oriented organisations, conventional living environments were able to overcome these conditions. The hard climate conditions have in many cases been mitigated by providing shaded courtyards, verandas, chabutras and streets among other elements.

Reflecting on selected cases in terms of reaction to the respective climatic conditions, the Asian Games Village uses a varied linear cluster and court for summer heat battle in the composite atmosphere in New Delhi. As such, wet months and winter afternoons are provided with ventilation and sunny areas. While the building's heat effects are not efficient in all places, they are often minimized by proper shading.

The Vadodara GSFC housing uses elements of this kind in a very different way, which offer an overall impression of substance and shadow "thick brick walls, paved bricks streets, pedestrian paths, courtyards, balconies and balconies." Furthermore, the primary source of relief are the narrow streets in the funnel wind clusters. In Mumbai, heat is a lesser

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issue, though Belapur housing alleviates intense radiation effects by efficient shading in intimate clusters. The central water stream also alters the microclimate and makes for fun outdoor areas, while on terraces and the upper floors the wind is more productive.

FINDINGS

The previous studies already established the value for residents of complete holistic comfort of well-planned public spaces in a residential community. The rising demographic patterns and migration patterns that lead to poorly planted residential areas have also underlined today's needs for these ecosystems. Although the traditional Indian settlements can theoretically solve these problems, recent examples can be inadequate due to rapidly growing numbers, widespread incompetence and lack of concern. Three existing examples from well-known designers must therefore be reviewed, in order to create useful solutions to physical, perceptive, psychological and social problems in the present context. The following guidelines are established through this review:

- Although the spatial structure and configurations of site units differ in the three cases, their relationships, unity, hierarchy, and transformation depend on the neighbourhood spaces. In both cases, towns and buildings are located almost centrally and people are competing in the open space. The desires and comfort of users are also addressed. Human needs will always be satisfied by passive, supportive interactions and a sense of comfort.
- The thorough study of the three cases chosen indicates that designers build a living environment that is similarly favourable.
- Built mass and character are visually interesting together with the street landscape, offering elements that contribute to the unit's distinctive personal presence while retaining a human scale. The locks, colours of the doors and materials make a reference to territoriality.
- It's not only built living areas that are residential environments. Compared to the built-up the unbuilt, which plays a greater role in the comforts of residents and users, must respond equally.
- Comfort factors in these environments range from physical to psychological and perceptive, as well as people 's social needs.
- Weather comfort, accessibility and convenience for discharge of the operation and effective transfer between locations depend on physics.
- Anonymity, security and territoriality, identity, visual pleasure and comfort, psychological and perceived characteristics are essential to respond.
- In the three situations, the vehicle and pedestrian movements are well described and delimited reducing the transitional hierarchy and are fixed properly. Parking lots are well built to minimize walking distances and are also well shielded from the view for optimum visual comfort.
- Spatial hierarchy obtained from various housing clusters leads to an apparent sense of location, privacy and territory, thereby encouraging community surveillance, social activity and common vandalism and aloofness.

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- The edges of the built forms are interactive with alcoves and niches in both instances, favouring informal interaction, collaboration and debate.
- All living conditions can be accommodated in various climatess by providing shared shade, suitable wind and multi-activity areas, which can alter weather and seasons.
- Even in identical settings, no case warrants repetition. It focuses on the importance of community space in residential environments and the diverse tools and techniques that popular designers use to create living conditions, particularly in the Indian context, for fostering a sense of belonging and wellbeing.

CONCLUSION

This research managed to holistically establish broad recommendations and discuss issues of quality open spaces. Moreover, it has left a void in trying to assess the total population and quality of life benefits of quality urban open spaces in suburban communities. The study will promote policy-making to include quality open spaces and accessibility and activity rates. Nevertheless, the study has laid the groundwork for more study on the relationship and co-location of open spaces and community and the benefits gained in the same field. Therefore, it is this study's perception that further research should be undertaken to try and focus on the qualitative assessment of such interventions.

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