

SLUM REDEVELOPMENT BY LINKING SOCIAL CONDITIONS WITH SPATIAL FABRIC THROUGH MORPHOLOGICAL STUDY

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Abstract: Cities represent the social cultural economic development. For the sustainable urban development physical, economical, social, cultural, and environment plays equally important role. The current planning process focus more on land use, infrastructure and transportation network, the development is mechanical with less regards for the rich layers of our cities which needs to be excavated downwards, into its earlier past, horizontally to be able to fold and integrated the complex. (Hall, 1988) Histories, texture and memories of our urban environments and their populations into the planning process. In case of developing nation where almost overall of urban population lives in slums and squatter settlements the social factor become impatient. In India slums, where is equal to be the largest in the 2030, the present urban population 37.7 % of total population and out of urban population, 7.75 % is the slum population. (NUHM, 2008-2012) Urban poverty and slums were always on the policy radar of India but still the problem related to the slums shall persist.

The city fabric reflects the social-cultural conditions. The slums are seen as grey patches in the city fabric, one big challenge before urban professionals is to upgrade this ugly patch with rest of the city. The present paper examines the reflection of socio economic conditions, particularly the pockets housing urban poor on spatial fabric through study of morphology of slums. It further attempts to understand how the social development can be made more sustainable by changes the morphology of slums. This exercise find the relevance as large scale development interchange as policy place keep in slum in mind. This effort will help planners to work at micro level i.e. at neighborhood level.

Keywords: morphology; redevelopment; slum; social sustainability

INTRODUCTION

Cities represent the social, cultural and economic development of society. These aspects play an equally important role in the sustainable urban development process. The sustainable development in the given context can be defined as “any development leading to social upbringing by way of economic growth, with the help of physical planning with minimum damage to environment”. The current planning practices focus more on land resources, provision of infrastructure and transportation network, the development is mechanical with less regards for the rich layers of our cities which needs to be excavated downwards, into its earlier past, horizontally to be able to fold and integrate the complex histories, texture and memories of our urban environments and their populations into the planning process [i]. In case of developing nation where almost one fourth of urban population live in slums and squatter settlements the social development becomes prime factor. From a socio-spatial point of view, the existence of slums can be understood as instability pockets which are necessary for the structural stability of the global system [ii]. Slums consider as the absorb part of the existent social instability - translated here as housing deficit. Viewed as such, slums are fragments that keep the system away from that otherwise would be a breakdown of the already fragile and unstable equilibrium of Third World cities socio-spatial structure [iii]. This idea comes to reinforce argument that slums can be seen as an alternative solution, rather than a problem for the housing deficit.

BACKGROUND

Urban poverty and slums were always on the policy radar of India but still the problem related to the slums persists. The city is certainly a complex system and spontaneous settlements are clear examples of these complex subsystems within a complex urban system.

The morphological characteristics of slums combined with their development process are traditionally understood as chaotic and unorganized [iv]. Though the Indian cities were built in layers of different times and are traditionally known for their inherent chaotic and discontinuous spatial pattern, the slums are seen as grey patches in the city fabric, one big challenge before urban professionals is to upgrade this ugly patch with rest of the city. In the Indian context, the redevelopment of slums whether in terms of relocation, in site rehabilitation or improved service, the success depends on understanding and seen in the light of a self-organized process. The natural and inevitable step towards spatial analysis of cities and its urban structures and consequently its morphological correlation with social events will be the attempt to establish relation between spatial-geometrical patterns and social-economical data [v]. The comprehensive review of research on morphology of Indian cities was made by Brush in as early as in 1962, he observed that Indian cities have their own peculiar structure and cannot be tested on western theories. Indian cities are often marked with uneven distribution of population in different areas, mixed circulation pattern and mixed land use. For identification of zones different researchers has used different parameters like occupation for functional zones (Sen 1959), Guha (1963) has used dynamic, static and rejuvenated morphological regions. Some later studies have used land use, residential pattern and distribution of slums in the city.

OBJECTIVES

The conventional definition of slum given by UN-HABITAT says that "It is a group of individuals living under the same roof in an urban area who lack durable housing, insufficient living space, denied from safe drinking water and sanitation facilities with insecure tenureship. In Indian condition the slums are defined as "a compact settlement of at least twenty households with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions" [vi]. However in the present study the focus is on identifying character of the built environment that allows defining slum areas based on quantitative and measurable parameters. In general, spatial data on slums are generalized, outdated, or even nonexistent. To capture the complex morphological pattern and at the same time capture the social objects typical for slums. Parameters such as building density, building heights, structure types and sizes are used to differentiate between slums and formal settlements. From it, the physical features are used to analyze structural homogeneity and heterogeneities within and across slums. Similarly for understanding the social fabric the ethnic groups, community spaces,

livelihood spaces and religious buildings are studied [vii]. The urban renewal program of India focuses on inclusive development of urban centres; it aims to encourage reforms and fast track infrastructure development with a focus on efficiency in urban infrastructure and service delivery mechanism, community participation and accountability of local government. In order to achieve inclusiveness and strengthen the role of community understanding of social fabric is must and its integration with built environment will give and inside if prevailing situation and aspiration of society.

CITY PROFILE

Bhopal, the state capital and infamous for the greatest ever industrial accident is being classified on the basis of chronological evolution the city in four distinct districts. The old city is the walled city, the new Bhopal, the administrative town South T.T. Nagar, the Industrial township of BHEL and refugee's township at Bairagarh. These four districts are distinct in certain manner, the old city is typical grid iron pattern and the focus being the Jama Mosque, the density is high, building heights varying from two-four storied buildings, typical mixed land use like any other Indian city i.e. shops and commercial establishments on lower floors and residences on upper ones. However the influence of community and occupation is very much visible in the spatial pattern. The streets distinctly houses garment shops, jewelry shops, hardware shops and even chatori gali (street of eateries) for mouth watering street food. Similarly the neighborhoods are based on ethnicity. The seven gates of the walled city are now part of history. After Independence the city grew beyond the limits and informal settlements mushroomed on the periphery of the old walled city.

The Bhopal was declared as the state capital after Independence and need of new administrative town was felt and resulted in the new Bhopal. Most of the hillocks were occupied by government buildings and townships and the unoccupied foot hills were covered by slums. Parallel to this development an Industrial township of BHEL also developed. Both this new townships were low density, well knit transportation network with legible pattern. Large open spaces as playgrounds and parks were provided, further the undulating topography kept the density low. Irrespective of comparatively new development the Bairagarh the fourth district remains high density probably because one of the edges of upper lake restricted the sprawl of this township developed for refugees. Irrespective of heterogeneity of the four districts one phenomenon was common to all and that was occurrence of slums which was inevitable in all parts of city. Though the city has the capacity to take care of the population growth, the mismatch between

planned and developed land led to formation of slum pockets almost in every part of city. These slums exist at two different levels first as a settlement it contributes to the character of region and impact on the settlement, secondly the inhabitants living in the settlement adds to the existence of the slum. The former is reflected in physical form of slum and the later in population living in.

In Bhopal, around 35% of the population lived in slums and squatter settlements. These slums and squatter settlements are located upon vacant or underutilized chunks of land, either private or government; or close to nallah or water bodies either they placed upon steep slopes or rock outcrops or in the catchment of water bodies. This is because of uneven terrain features of the city which otherwise lie vacant and subsequently start to accommodate slum dwellers. People occupied these areas and start living. These areas are not suitable for habitation but due to proximity, people start live in such a pathetic condition.

The slums are initially located on the outskirts of walled city but acquired central position due to expansion of the city are now in the heart of the city. The slum dwellers of such settlements contribute to the city as service sector. Similarly the slums of new Bhopal houses many government employees, many of them are engaged in informal sector and others work as domestic help in nearby community. These slums are on government and private land. In spite of the fact that the new city is planned one, doesn't have place for slaughter house, butchery shops, repairing and scrap shops. These shops are accommodated in slums; also the livelihood of the slum dwellers is supported by cottage industry, seasonal works and as unskilled laborers. The genesis of slums reveals that slums occupy government, public or private lands, the land value of such land vary from place to place, the land use is may be incompatible and development may not be with respect to topography. The redevelopment of slums can release high value land, more suitable land use can be allocated and the risks can be reduced. However, it is not possible to intervene for rehabilitation until and unless the inhabitants. The recent slum policies of India aims at slum free cities, as a result many rehabilitation and resettlement are being initiated, the present study presents the relationship of social issues with the physical fabric^[viii].

SELECTION OF THE STUDY AREA

To achieve the objective large scale development initiatives has been taken for improving the situation of slums. The morphology of slums can be study in terms of location, landform, land ownership, physical

conditions and social groups. To understand the relationship of social fabric and built morphology the present study was carried out in two different slums of Bhopal city first in which no intervention takes place and the other in which intervention takes place. The selection slums are in the prime location as it is located in the administrative area and residential area of Bhopal city. This area has high land price and potential to urban development. Moreover, the people of the study area served the surrounding neighborhood and city for many purpose. Most of them are maid, driver, slaughter house, welding shop, bamboo shop, repairing shop, cottage industry, chicken shop, photo frame, music band shops and worker in the small retail store as helper. This study area will help to understand the morphological characteristics of slums.

Banganga, Bhopal

Banganga slum is located in western part of Bhopal city on a steep and rocky ridge, with a big drain flowing across it. It lies between the Shyamla hills and T.T. nagar region. After the Bhopal gas tragedy it came in to existence due to this there is sudden increase of people coming and settling here and some part of it is called Pratap nagar and other Hasnat nagar. Pratap Nagar, Hasnat Nagar and Shakti Nagar are originated earlier than the settlement of group a due to increase in urbanization up to 80.1% in Bhopal after coming up of BHEL, and industrialization. Hasnat Nagar is another part of this slum with mainly Muslim communities. The origin of the name "*Banganga*" comes from a small natural water source which can be still seen near the Jharneshwar Mandir. Total area of Banganga is around 42 acres in which more than 15000 population live. It is always been a dwelling place for the lower income groups. But earlier it was not so as it is now. It was a beautiful landscape with continuous natural water flow. But as the days passed it has become more and more crowded developing as a slum. Banganga is distributed into three major parts Pratap nagar, Hasnat nagar, Banganga and Shakti nagar. Pratap nagar, Hasnat nagar is on the Rocky Outcrop with Slope of 7 degree, where Banganga has more number of Open Spaces, Better living conditions and Shakti nagar is highly congested.

Banganga is in close proximity to government buildings on one end and the CBD of Bhopal on another end. It is on sloppy side which is not suitable for construction, but due to its prime location people have started living there even in a pathetic condition. It acts as a major support system for existing CBD as it houses activities like repairing shops, poultry, taxi drivers and also most of educational institutes and coaching institutes are there.

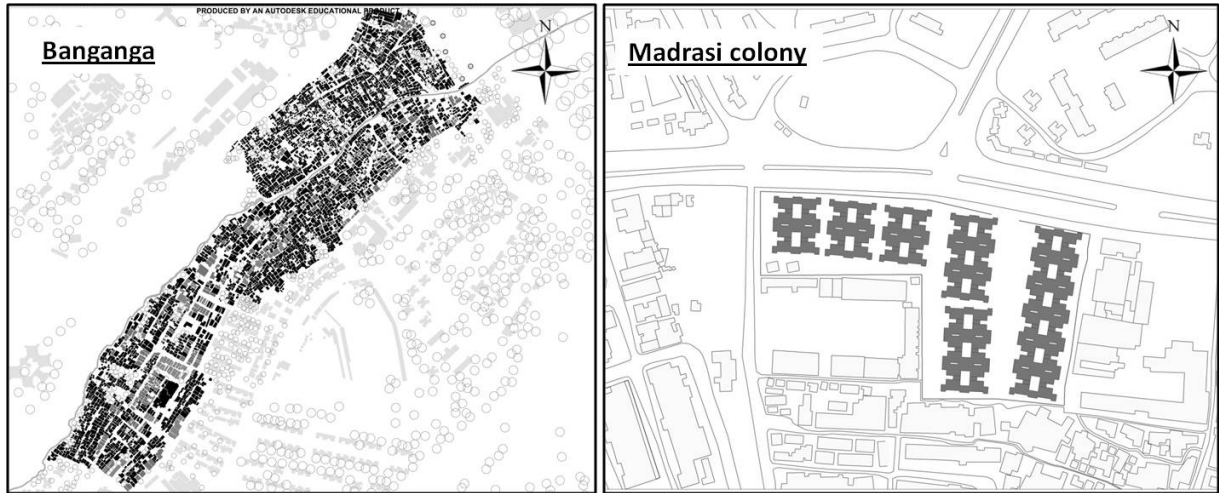


Figure 1: Settlement pattern and layout plan



Figure 2: Banganga Settlement

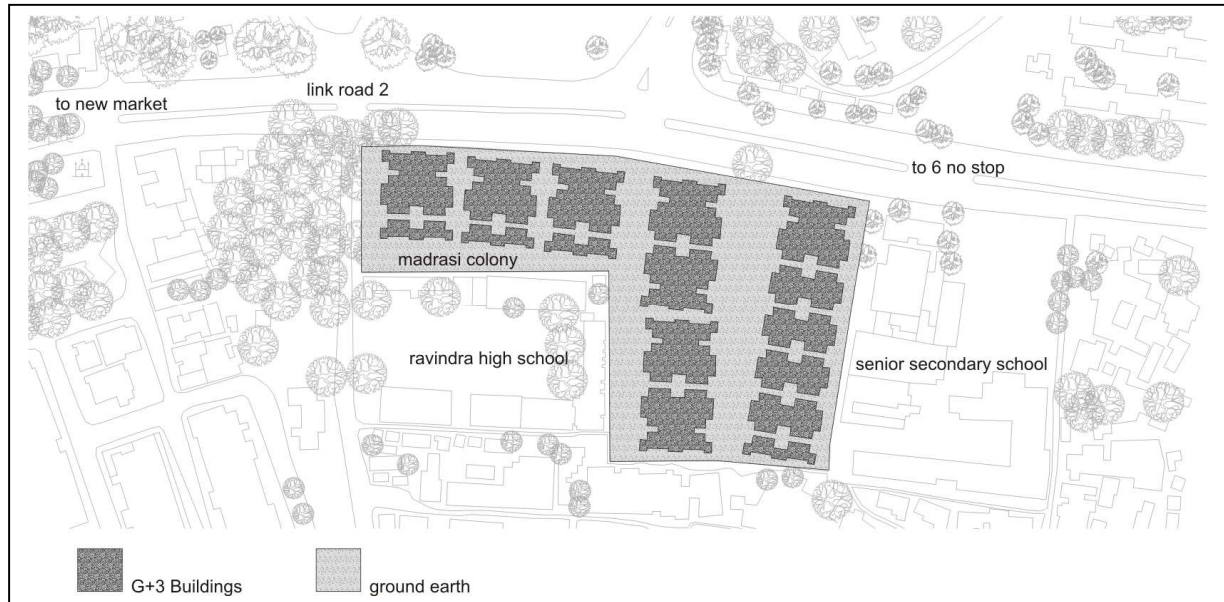


Figure 3: Madrasi Colony Settlement

Table 1: Typological Dimensions

Name of the Settlement & location	Occupancy Dimension	Cultural Dimension	Built Form Dimension
Banganga	Occupants have built their own houses.	Close knit social network and cultural cohesiveness	Unorganized and self build spaces
Madrasi Colony	New prototype housing is constructed on land as part of Slum Rehabilitation process under JNNURM program (2009).	Formal neighborhood with weak social ties and cultural values	Planned spaces and unutilized spaces

Settlement pattern is inorganic with no geometry. The land use as per master plan is in environmental sensitive zone but presently it has 70% residential land use, 20% commercial on street shops and 10% community spaces. Most of dwellings units are in fair condition majority of them are semi-pucca and kutcha. People keep repairing their houses at regular interval to keep in proper conditions to live in. House layout are unplanned, room dimensions are insufficient and undefined spaces with open space 5-10% only. Streets are narrow and obstructing profile which creates conjunction. There is no provision for the movement of vehicles even in disaster like fire brigade and ambulance, which leads to insecurity during accidents and also urban floods. There is an inadequate water supply. Drinking water lines pass through sewage providing contaminated water.

Also People here raise animals like goats, chicken etc. Open defecation, water stagnation and leakage of water pipes are the major problem of concern. There is no solid waste management system of collection. People generally throw garbage into the nallah or on the street adding to unhygienic conditions. Sanitation is the major problem here. They are not provided with proper public toilets. The rocky out crop is used for this purpose as it not used for any other purpose. This ruins the environment and contaminates the area. Banganga is the catchment area of lower lake; it was earlier used as irrigation and fulfills the need of people. But now it's degrading due to its use as waste, sewage dumps, and garbage disposal into the nallah, which is one of the reasons for choking, overflowing and leading to urban floods as it happened in year 2006.

Community fabric

In Pratap Nagar and Hasnat Nagar, Muslim and Hindu communities live together. They have strong community links with well knitted social ties which makes them dependent on each other for economic reasons. As such whole area is congested but there is some open space in front of Anganbadi which is used as community space for marriages, functions etc. Also places like Budha Mandir, Shiv Mandir and Community Centre are used for that social purpose. There are also various NGO or samities for different activities such as Suraksha Samiti, Mahila Mandal.

While studying the morphology of this part of urban area it was observed that it was organically developed over a period of time and so the texture of spatial fabric is very coarse with semi built and temporary constructions. The spatial fabric is well knitted with the concept of work and lives as their livelihood spaces and living spaces are integrated. The streets are movement spaces as well as working and playing spaces. The self employed communities organized

their spaces for their livelihood activities. The making of space is an outcome of the socio-economic product. There is also a relationship between subjectivity and topography as the character of the build space is subjective to the risk of calamities like urban flooding during rainy seasons. The flexibility in use of spaces depicts ways in which slum dwellers transformed the hard rock land to their usable spaces.

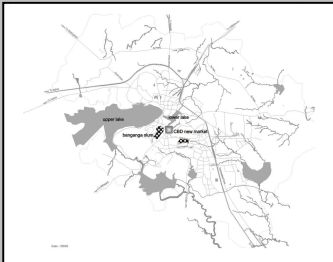
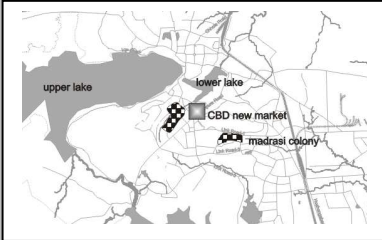

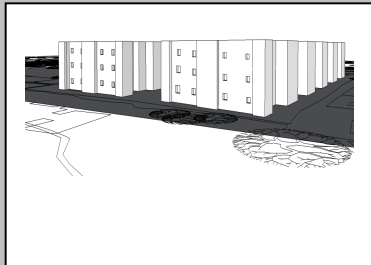
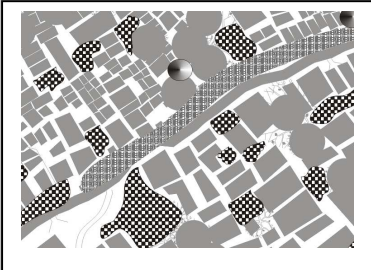
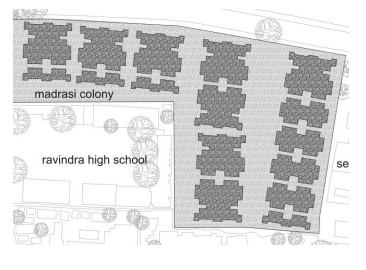
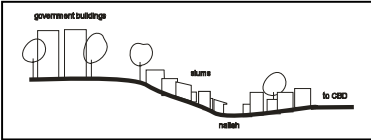

Madrasi Colony, Bhopal

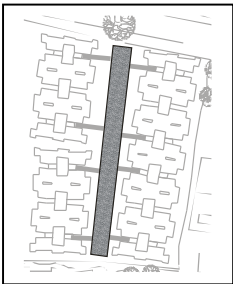
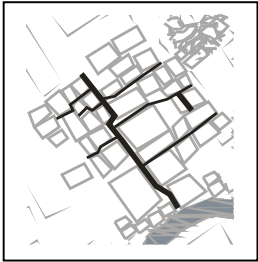
Bhopal lies in the hilly terrain slopes and hillocks. Due to the uneven terrain features of the city the vacant land is prone to accommodate a large chunk of slum dwellers. Madrasi Colony is one of the areas located in southern part of Bhopal city on the plain land where a large chunk of slum dwellers lived. New prototype housing is constructed on the same land as part of Slum Rehabilitation process under JNNURM program (2009 constructing around 576 tenements to rehabilitate slum dwellers of Madrasi Colony. Under the JNNURM projects they have replaced the shabby, informal, haphazard slums with a well ordered layout of apartment blocks. The sub-standard haphazardly used materials of construction have been replaced by concrete buildings of uniform style, quality and clear tenure and in house toilets.

Settlement pattern is organic and geometry. All the houses are used for residential purpose and properly planned with open space around 60%. Streets are formal grid pattern with proper vehicles movement providing ease of accessibility and safety. The rehabilitation is done in G+3 apartment units stacked next to each other with 2.5 to 3 meter distance between them. Each building has 16 to 24 houses on each floor and is constructed with RCC frame and brick walls. Each house has a single multipurpose room with a kitchen space and toilet. The building design shows no typological experiments to deal with work-living situations common in low income households. Light and ventilation conditions in these tenements remain abominable.

The problems faced on the rehabilitation sites were visible like creation of a new concrete slum environment due to the poor maintenance of buildings, choked sewer lines and absence of solid waste management. There was also an impact on the livelihoods of the displaced communities in the interim situation. The families earlier had small size of their units with the open interacting spaces between them, since they lived on the ground floor. Many have also lost their occupational/production spaces. Those who are employed in the government or private companies are relatively better off. But people like washer-men, potters or those making bamboo/cane work or hawking food items prepared in their houses have to look for different occupations.

Table 2: Details of Settlements

S.No.		Banganga	Madrasi colony
1	Location	Western part of Bhopal city, on the valley terrain.	Southern part of Bhopal city, on the plain land.
			
2	Age of the settlement	About 35 years	
3	Area of Settlement (Hectares)	42 acres	
	Land use	Mixed land use, Settlement is self Sustainable	Residential, Not self sustainable
4	Estimated No. of Units	3500+	575
5	Estimated Population (persons)	15000+	3000+
6	Height	G,G+1, G+2, G+3	G+3
			
7	Structure Types	Kutchha, Pukka, Semi Pukka	Pukka
8	Settlements	Informal and unplanned	Formal and planned
			
9	Open space	5-10%	60%
10	Ground Coverage	70-80%	40%
11	Land Availability	Unsuitable for construction	Suitable for construction
			
12	Pattern	Inorganic and non geometry	Organic and in geometry

13	Streets	Obstructs profile, no provision for the movement of vehicles and other services.	Formal grid pattern, proper vehicles movement and other services
			
14	Density (Persons / Hectare)		
15	Water Supply	Community Tap	Individual House Connection
16	Sewerage Disposal	Public Toilet & Open Defecation	Individual Toilets & Sewer Line
17	Social	Community space	Lack of community space

There is no space or enough water for laundry purposes, ironing with electric irons is prohibitively expensive in terms of electricity bills. The result is that on top of the worry of paying mortgages, the families are worried about the higher costs of living as against the drops in their income levels due to the new adjustments. The market price of their units and its real estate speculation value is not lost on them. The regular design of the unit is such that it caters to the demand for EWS/LIG housing market, where households are able to pay for such units. Most families need to undergo hidden costs of renovating their units. Most of them, cannot afford to live due to high cost of living and loss of in house employment. They are in pressure to illegally 'sell' or 'rent' the houses for income [ix]. Especially families belong to the economically weakest sections, the problem is acute. They are trapped in a situation where they have lost their slum dwelling, but know they will not be able to bear the costs of living in the new houses and must leave sooner or later, therefore compelling them to adopt illegal means of substantiating their incomes through their newly acquired assets. The result is that their expectations have been dashed and there is widespread discontent among the rehabilitated communities. Most feel trapped.

While observing the morphology, it is very well planned with even street widths, cluster apartments and safe clean campus. The build environment though does not incorporate the concept of work and live as they have no approach to working spaces and their living and working is now totally disintegrated. The fine texture of the urban area does not reflect the flavor of socially knitted communities who use to live and work together in close proximity and interdependence of economic and social activities. The quality of life has resulted in increased hygiene

and security from risks and hazards but has lost the community fabric.

COMPARISON

Comparing the two case studies Banganga and Madrasi colony, it was found that population density in Madrasi colony is more than Banganga because of the morphological changes in the settlement pattern. By proper planning, Madrasi colony occupies the population in 40% ground coverage whereas in Banganga it acquires 70-80% ground coverage to settle that much of population. In the layout plan of both the slums we see the difference in the settlement pattern. People get more open space in Madrasi Colony as in Banganga open spaces are very less. These are the positive aspects of Morphological changes in settlement pattern. Almost all slums are located on the periphery of major roads. For the purpose of internal circulation, all the slums majorly have either CC road or kuccha roads. The slums present within the city have good internal road circulation, whereas the slums located on the outer lack this provision and possess kuccha road. Streets layouts and pattern in Madrasi Colony are wider and straight as compare to Banganga they are narrow and sloppy. In Banganga streets generally vary from 0.8 m to 1.5m wide where as in Madrasi colony streets are more than 2m wide. Build structure are in proper geometry and planned in Madrasi colony where as in Banganga they are improper geometry and unplanned. No proper ventilation in Banganga where as Madrasi colony has proper ventilation. Madrasi colony is now newly planned and now in uniform pattern where as Banganga is as its and it grows organically.

Table 1 aims at comparing the typological dimensions between the settlements that were studied

for this research. This is assessed through a comparison of: (a) Occupancy Dimension – Tenure, mode of occupation, extensions, etc. (b) Cultural Dimension – Community Characteristics, Work / Occupation Characteristics, etc. (c) Built-form Dimension – House-form, Street / Open-space form etc.

The question is irrespective of its improved physical environment and secured establishment the redevelopment proposals are unable to address the socio-spatial relationships i.e. the relationship of their work and live environment integrated with the physical land.

CONCLUSION AND INFERENCES

The morphology study suggests that the redevelopment program of slums should essentially consider the following issues. The character of urban slums is heterogeneous in terms of type of structure, use of building (residential and commercial), livelihood opportunities and spatial configuration. So before making any intervention above factor should be considered for sustainable redevelopment programme.

This paper explores an area both as geographical places and as setting of social relationships. It calls for a more comprehensive approach to investigate the socio-spatial relationships. It tries to understand the variables of urban fabric. It promotes an approach that is based on adaptation. The properties of the self build spaces are most supportive of a variety of social living conditions, and which are most able to accommodate changing ways of life that should be taken into consideration in the planning and design of new communities. The close spatial locations of neighbors enable the communities to perform functions that more distant network members might find difficult to accomplish. Physical proximity continues to affect the frequency with which people see one another and provide emotional as well as material aids. The physical and spatial structure of neighborhoods is the outcome of a long history of small-scale, incremental changes, which accumulated over time to produce street patterns with neither geometrical nor functional simplicity there is no one-size-fits-all “blueprint” to the development. It is the particular attributes of each locality - spatial, social, economic, and political - that need to be considered in deciding the appropriateness of similar developments in the future.

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