ROLE OF SPATIAL HIERARCHY IN RESETTLING THE URBAN POOR:IMPLICATIONS OF SPATIAL CONFIGURATION ON PRIVACY AND INTERACTION

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Abstract

The Government organizations in Sri Lanka often resettle the urban poor in high-rise housing. Such housing interventions often do not acknowledge the spatial relationships and organizations of such communities which play a key role in their social ties and way of life.

This study explores the spatial configuration of a low income settlement before and after settlement. Following which the study examines the impact of differences in spatial configurations on the overall housing satisfaction. The impact on privacy and social interaction was specially focused on in the analysis of housing satisfaction.

An ongoing community housing project "MuwadoraUyana" in Colombo-Thotalanga was selected for the study. The differences in spatial configurations using space syntax and the residents' views on interaction and privacy using interview were explored in the original low rise and the new high risesettlement. Study highlights the importance of spatial hierarchy and identifies the spatial structuringand spaces necessary to achieve desired interaction and privacy in an original low rise low income settlement. Following which the need for demonstrating such spaces and design directions for a high rise settlement is discussed.

Key words: low income settlements, resettlements, spatial configuration, social interaction, privacy

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Introduction

Housing the urban poor in high-rise mass housing blocks is a common strategy for rehousing the urban poor and freeing urban land for development. The Government envisions a better quality of life and an improvement to communities and settlements in such a process. But if such a strategy produces better quality of life and communities is debatable. There is constant debate over lack of access to infrastructure, services and livelihoods, overcrowding, lack of privacy, disruption to social ties and social networks, inhabitable housing units due to lack of natural ventilation and light, misuse of public space, lack of maintenance , management and poor quality of construction.

This paper focus on the spatial configuration of low income housing and how such configurations play an important role in achieving overall housing satisfaction through desired levels of privacy and interactions. The study explores a housing project before and after resettlement to examine the differences in spatial configurations and the inhabitant's response to such differences for their overall housing satisfaction. The study is based on the premise that significant changes in the spatial configurations result in changes to spatial hierarchies within a settlement and such change when resettling the urban poor can result in an absence of desired privacy and social interactions which leads to an overall dissatisfaction of their neighbourhoods.

The paper acknowledges the importance of respecting the original spatial patterns of communities when rehousing them into other forms of developments for achieving satisfaction in the places they live. The paper is limited to seeking the relationships between outdoor spaces of such low income neighbourhood and highlighting same as criteria that needs to be inbuilt into the spatial hierarchies of new housing forms. The study focuses on the relationships between spaces that need to be addressed and achieved when resettling or upgrading the urban poor.

1.0 Spatial Needs – Physical and Psychological

People have used communicative significant building forms to build their settlements to satisfy themselves. When creating habitats, people who are having very different attitudes and ideas, have to respond to varied physical environments. These responses vary from place to place because of changes and differences in the interplay of social, cultural, ritual, economic, and physical factors. The formation of a house form is not simply the result of physical forces or any single casual factor, but is the consequences of a whole range of socio cultural factors in their broad terms. These socio cultural influences base on the human behavior and the maintenance of the relationships. Thus spaces have a greater connection with human behavior patterns and socio-cultural relationship (Rapoport, 1969).

In order to understand the spatial needs and hierarchies of a neighborhood one must explore physical as well as psychological needs of people which have influence on their spatial needs. (Williams, 2005).

Physical characteristics of a neighborhood such as volume, lighting, green spaces, environment type, mix of functions (public spaces and private spaces), connectivity of pathways, accessibility of spaces, functionality of spaces, spatial structuring are some of the most important physical needs that can be identified. As discussed by Higgitt & Memken J.A., (2001) residents are more satisfied with their neighborhoods if covered with greenery. Also the shared spaces help to

achieve higher occupancy satisfaction and such shared space include network paths, pockets, open spaces and corridors (Praytno, 2013, p. 103). As cited in (Franck &Ahrentzen, 1989; Fromm, 1991, 1993, 2000; Hanson, 1996) residents maintain and manage indoor and outdoor communal spaces and organize regular social activities within the communal spaces. Various studies have considered the social contact design principles adopted in housing such as the provision of indoor and outdoor communal facilities; good visibility into all communal spaces; Gradual transitions between public and private space; Provision of semi-private outdoor spaces close to private units for socializing; Buffer zones; Positioning of key facilities (activity sites) and access points on shared walkways.

Psychological needs are very complex to understand because they are bound with each personality. According to many researchers there are overall psychological spatial needs in neighbourhoods. Both personal factors and social factors affect psychological spatial needs. According to many researchers there are overall psychological spatial needs in neighbourhoods such as willingness to interact with the society; willingness to have privacy from the society; Influences on previous settlements; values; communication processes; social structure and customs. As cited in (Gifford, 1997) the neighbourhood satisfaction is higher when the residents believe their current neighbourhood is improvement over the former one(Higgitt & Memken J.A., 2001). Most of the residents also want good neighbors. For some, this concept means residents who are quiet and respectful of each other's privacy. For others it means forming social ties with other residents. (Higgitt & Memken J.A., 2001)Also neighbors may provide various kinds of supports to each other for example emotional and physical. These social ties of neighbors or their privacy respectful neighbors will strongly influence neighbourhood satisfaction.

Physical and Psychological needs of the dwellers are quite often neglected and overlooked when housing the urban poor. In the case of such housing category the psychological needs play an important role as they are mostly a group of inhabitants who are sustained by their social interactions and ties with their neighbourhood and neighbours. Unlike in middle income or high income housing the social ties and networks play a very important role in the lives of low income dwellers where the psychological factors directly link with the social ties and networks of the community.

2.0 Interaction and privacy for housing satisfaction

Definitions of privacy have one characteristic in common. The important point in all those definitions is the ability of one person or a group of people to control audio-visual and olfactory interaction with other people .In other words, privacy and social interaction have a close relationship. Rapoport (1969) defines privacy as the ability to control social interaction and being able to choose the desired rate of social interaction. Hence, privacy should not lead to isolation. A number of theorists have referred to the human's need of territory as a need to manage the bound between self and others. Further refers to spatial territory as not only a place to provide privacy but also a place to stabilize social contacts. If the social needs of people are in balance with the sense of independence provided by privacy, social interaction will be easier. Spaces that are indefinite and it is not clear whether they are public or private allow less control on social interaction and decrease it as a result (Ramezani & Hamidi, 2010).

The discussion dealing with separation of domains and social inter-course suggests that the house cannot be seen in isolation from the settlement, but must be viewed as part of a total

social and spatial System which relates the house, way of life, settlement, and even landscape. Man lives in the whole settlement of which the house is only a part, and the way in which he uses the settlement affects house form, as, for example, in areas where the meeting place is the house, and others where the meeting place is a part of the settlement, such as a street or plaza(Rapoport, 1969, p. 69).

"The meeting of people is also a basic need, since man has been defined as a social animal. What concerns us is where people meet, whether in the house, the cafe, the bath, or the street. This, not the fact of meeting itself, affects the form of the habitat." (Rapoport, 1969, pp. 68–69).As cited in (Williams, 2005) Various research studies have found that mutual support networks and social relations are stronger and more developed in community neighbourhoods (Marcus & Dovey, 1991; Brenton, 1998; Meltzer, 2000). Researchers have identified several design features to improve social interaction in community neighbourhoods. Researcher Torres-Antonini (2001) determined six factors such as Shared open spaces; Grouped structures; Peripheral parking; Pedestrian circulation extensive common facilities; Centrality of the common house. Circulatory systems and surveillance opportunities affecting security, Densities and accessibility were other key design features influencing the strength of support networks within a community. (Williams, 2005).Most social interactions tended to occur in communal or semi-private spaces. These interactions were classified as, being: formal or informal; Frequent or infrequent and Sustained or brief. Formal social interactions are more likely to occur in indoor communal spaces, whilst brief informal interactions are more likely to occur in outdoor communal spaces, in semi-private spaces (outside private units).

Ramezani&Hamidi (2010) were researching about the privacy and interaction of the traditional towns and its effect for wellbeing of the people. According to their findings on other researches Privacy; Personal space and Territorial behaviour affect perception of convenience and quality of environment. The need to have privacy is common amongst human beings and helps in meeting other needs of security, affiliation and esteem. However, the way people express this need and the way to achieve it is different in different societies. Physical privacy is important for social behaviours. In an environment with physical privacy a wider range of personal choices occur. One of the ways to achieve privacy is to avoid contacting with others while another way is to control spatial territory.

3.0 Spatial Configuration Vs Interaction and Privacy in a Settlement

Spatial hierarchy is one of the main factors to examine the physical situation of the neighbourhood. Bill Hillier, who thought that it is all about the space and not the form, agrees that the space is the machine. It has the all the mechanisms and relationships. In houses personal space and human territory tie to the human agent. And "space is more than a neutral framework for social cultural forms. It is built in to those forms. The form is built influenced by the social cultural forms which means social organizations affect the configurations of the space."(Hillier, 2007, p. 20).The space is connected to the culture relationships and the configuration. Every aspect of space is important when planning group of spaces. Culture is bounded with spaces. Combining such factors with space is difficult though: because the ultimate result would be unpredictable. Culture is made real for us because of the spatial organizations are directly affect. Space and society are always likely to be structured in the spatial image of a social process of some kind. Question is how exactly these structures happens and looks like.(Hillier, 2007, p. 20).

The book "Social logic of space" by (Hillier & Hanson, 1984) takes "the space" as a configuration, which creates patterns generated by group of people which is called neighbourhood. The relation between people and the space will be found at, the level of the configuration of spaces, rather than the individual space. The relation between social existences lies in the relation between configuration of people and configuration of space. "In the book the main argument is that a configuration of space can be influenced by a configuration of people and a configuration of space can influence configuration of people."(Hillier, 2007) There should be spatial configuration with lots of spaces to contribute community feeling (interaction) and privacy.

The space is connected to the culture, relationships and the configuration. Every aspect of space is important when planning group of spaces. Spatial configuration has two sides. The spaces that uplift privacy can be named as *deep spaces* while the spaces that encourage interaction can be called *shallow spaces*. Space becomes a powerful material for transmission of culture through buildings and settlements forms. Configuration exists when relations between two spaces are changed according to how we relate one to another (Hillier, 2007). The way multi-family residential buildings are designed can lead to a disruption of social ties due to the disruption of spatial relationships and hierarchy (Abbaszadeh*etal*, 2009).

From the term privacy derives the personal space. Human unconsciously are maintaining a personal space in their neighbourhood. Houses reflect their personal matters and personal identity in the neighbourhood. On the other hand public or social spaces are completely different to a private space. Social spaces increase human interaction while a space which falls between these two categories is called a semi-public space (Dharmatilleke, 2013).

3.1   Spatial hierarchy and structuring of spaces

Space can be categorized and divided according to usage patterns and combined according to devised sets of rules. The spaces are structured according to the privacy levels. The hierarchy in the form of an architectural building leads to the formation of the spatial domains with different functions and shapes. To be able to sequentially perceive the hierarchy of spaces (territories), the individual by passing through a series of spaces, must recognize specific and distinguishable spaces and perceive them together. Using the theoretical foundations of the hierarchy of spaces it provides opportunity for the components to create a hierarchy of public and private spaces, due to ensuring privacy. It also allows to provide social interaction between residents.(Newman, 1972).

The spatial hierarchy is important in outdoors and indoors both. But most importantly outdoor spatial structuring is important in some particular type of neighbourhoods such as low income neighbourhoods. According to (Newman, 1972, p. 15) there are some classifications about the public and private areas and a hierarchy is created according to the level of public access. Public space acts as a common place where people interact and communicate. The border line which is in between the semi public and private area is called a threshold by Amos Rapoport in his book house form and culture as the territory starts from there.

3.2   Space syntax method

Space syntax is a method to identify and analyze the spatial configuration of the urban neighbourhoods (Hillier & Hanson, 1984). This morphological analysis is based on spaces and pathways. This method is able to read space objectively while maintaining the association

between physical structure and social structure. It expresses the potential for people to get together and explore the logic behind people and space (Hillier & Hanson, 1984).

Geometry of the space and application of space syntax

Axial maps: Axial maps in syntax theory are considered as the straight lines which pass through the spaces. Considering the maximum visual distance of space to space the lines can project through the distances. There may be several axial lines in particular settlement which passes through the spaces. Longest lines and the shortest lines, interpret the statistical value to identify the integrations and segregation spaces. When the axial maps are done, the next step is to complete the calculations of the integrations. Basically axial maps finally measure the spatial integration of the settlement or a city (Hillier & Hanson, 1984).
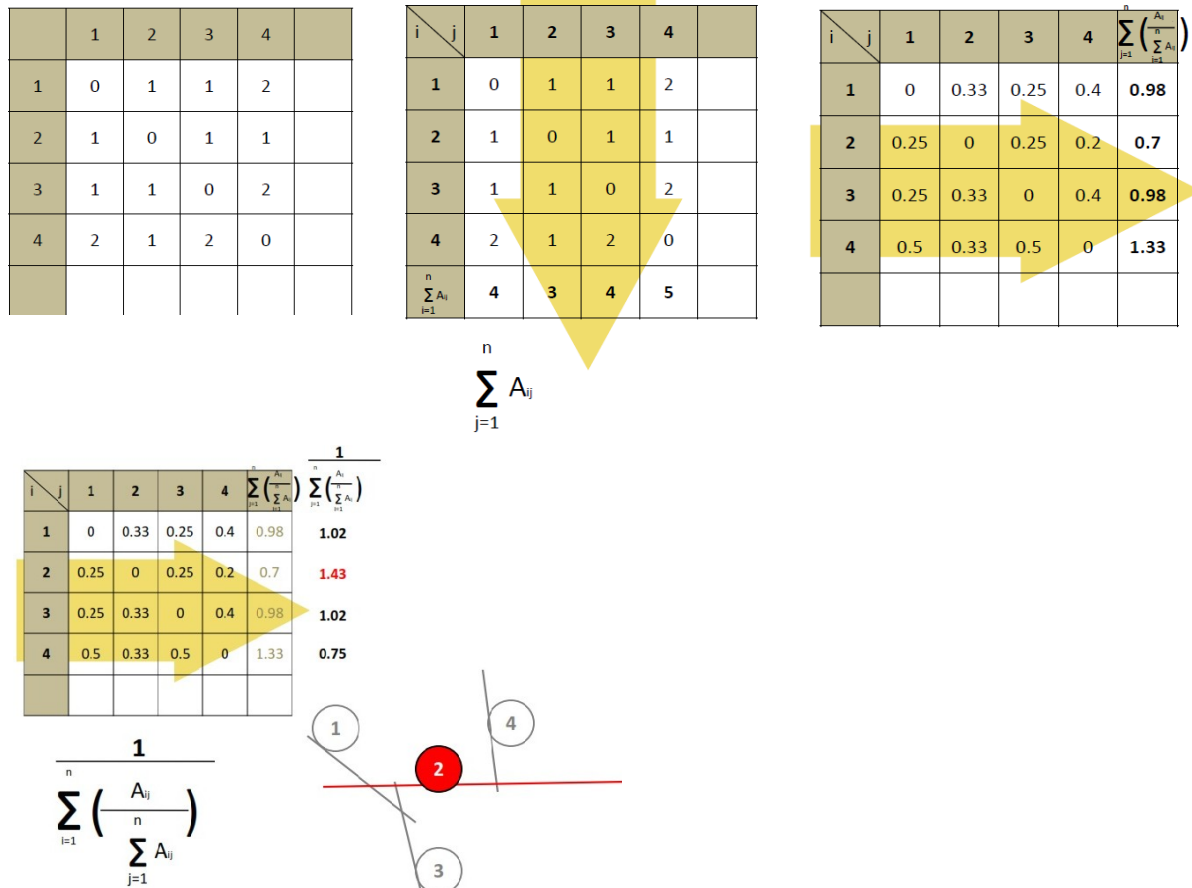
Maximum visual distance: The first step of this method is to draw maximum visual distance lines. A reference point is first selected and from that point a straight line which touches the maximum visual point is drawn. These lines show the connectivity of the spaces. Then it should be numbered and these lines show the maximum visible distance of the neighbourhood (Fig 01).
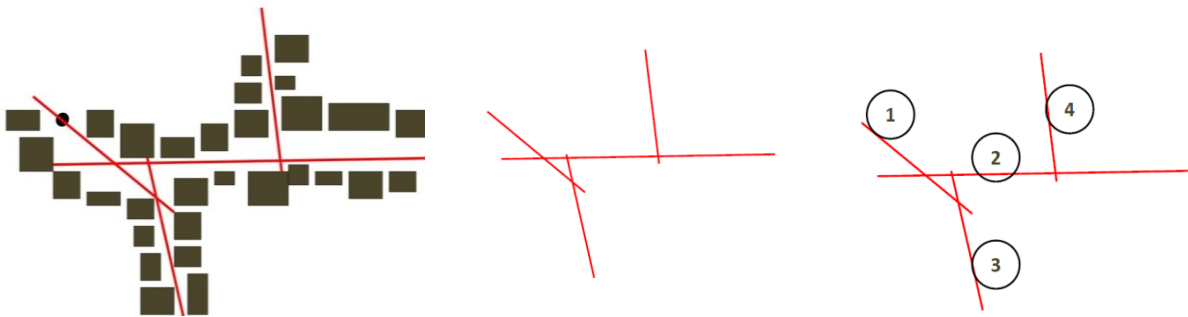
Fig 01: Axial map (lines) with maximum visual distances and numbering.
Source- Retrieved from http://spacesyntax.com

The numbers of the lines are put into a cage horizontally and vertically as shown in figure 2 below. Following which the total value of each column is calculated vertically down. Each

number of the particular column is then divided by the total of that column and the divided values are added together as shown in Figure 2

	1	2	3	4
1	0	1	1	2
2	1	0	1	1
3	1	1	0	2
4	2	1	2	0

i\j	1	2	3	4
1	0	1	1	2
2	1	0	1	1
3	1	1	0	2
4	2	1	2	0
$\sum_{i=1}^{n} A_{ij}$	4	3	4	5

$$\sum_{j=1}^{n} A_{ij}$$

i\j	1	2	3	4	$\sum_{j=1}^{n}\left(\frac{A_{ij}}{\sum A_{ij}}\right)$
1	0	0.33	0.25	0.4	0.98
2	0.25	0	0.25	0.2	0.7
3	0.25	0.33	0	0.4	0.98
4	0.5	0.33	0.5	0	1.33

i\j	1	2	3	4	$\sum\left(\frac{A_{ij}}{\sum A_{ij}}\right)$	$\frac{1}{\sum\left(\frac{A_{ij}}{\sum A_{ij}}\right)}$
1	0	0.33	0.25	0.4	0.98	1.02
2	0.25	0	0.25	0.2	0.7	1.43
3	0.25	0.33	0	0.4	0.98	1.02
4	0.5	0.33	0.5	0	1.33	0.75

$$\frac{1}{\sum_{i=1}^{n}\left(\frac{A_{ij}}{\sum_{j=1}^{n} A_{ij}}\right)}$$

Fig 02: Results of Axial Map
Retrieved from http://spacesyntax.comering

Integrations and Segregations: The final measurement of this theory will be the integration and segregation of the spaces; connectivity between social and spatial structures called as integration and less connectivity called as segregation. Line number 2 as seen in Fig 02 above has the high spatial integration while Line number 4 shows the low spatial integration.

"These measures are essentially formal interpretations of the notion of spatial integration and segregation, and it was the formalization of these terms, which first seemed to identify structures which linked the social and the spatial. Providing a measurable scale from segregation to integration, enabled statistical comparison of different spatial forms across cultures, and hence provision of a platform from which social origins and consequences might be investigated." (Hillier & Hanson, 1984).

Spatial depths (Deep spaces and shallow spaces)

Spatial configuration has two sides. One is deep spaces which are segregated spaces that encourages the privacy and second is integrated shallow spaces which encourages social interaction(Hillier, 2007). Deep spaces in a neighbourhood are protected. Shallow spaces can be reached by any one from outside.

4.0   Objectives

The main two objectives of the research would be to understand the spatial configuration patterns of the two settlements, and the effect of spatial configuration on privacy and social interaction.

- o   Identify the spatial patterns of both low rise and high-rise.
- o   Identify the effect of spatial configuration on privacy and social interaction.

5.0   Methodology

A case study method was used for the study in order to conduct an in-depth analysis of a selected case relevant to the objectives of the study.

5.1   Case Selection

The study explores ongoing community housing project in Colombo-Thotalanga which is named as "MuwadoraUyana". The resettlement process in this case is planned in two phases. The first phase is completed where part of the housing is demolished and resettled in the high-rise and the second phase is still underway. The original settlement and resettled high rise is located in the same site (fig 03). The advantage of this case is that the memories of the previous living environment are very much alive among the resettled community. The data was collected from the original and the resettled community.

The original settlement has less infrastructure and other facilities. They are small single storey studio type houses. The pathways, alleyways and small transition spaces from public to private spaces can be observed in the outdoor spaces. Most of the houses are made of impermanent construction material. Part of the community was resettled in the new high rise blocks in January 2015 as the first phase. Comparing with the infrastructure of original settlement this one has better facilities and the physical qualities of houses are better. The outdoor spaces are minimal with hardly any public and semi-public spaces. Houses include a living, 2 bedrooms, kitchen, toilet and a verandah unlike the single space studio houses in the original settlement.

Fig 03: Satellite images of Original low rise settlement (left)
& new high rise settlement (right).
Source: Google earth

Fig 04: Layouts of the original and New settlement
Source: UDA, Sri LAnka

5.2   Data Collection and Analysis

Objective 01- Understand the spatial configuration patterns of the two settlements

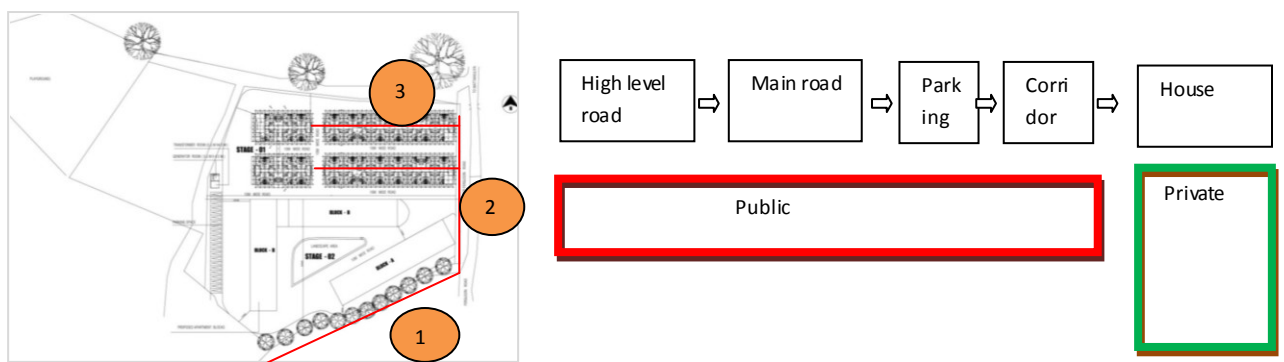**Observations made on the hierarchy of spaces to approach the housing units:**

The outdoor spatial arrangements were observed in both settlements and observations were made as follows:

There is a significant hierarchy of spaces to reach the houses in case 1 with a dear indication of entry into the settlement. A hierarchy of roads, streets, alley ways, public space, semi public spaces and private spaces are observed as shown in figure 05 below. Houses are protected by semi public spaces "Midulla" or front yards and series of spaces with a variation in scale and function. There is a variation in the hierarchy of spaces into houses located in the periphery and houses within the center of the settlement. Tree shades create a sense of protection and intimacy in housing dusters.

Fig 5: Hierarchy of spaces to access the houses in the original settlement
Source –Author

In the case of the new settlement in the high-rise; there is a significant difference in the formation of the layout from a cluster to a linear layout. There is no clear feeling of entry into the settlement or the external areas of the settlement. The entry is demarcated at the entrance to the building rather than the entry into the site and the building is in isolation from the site. There is no significant horizontal hierarchy in paths from entry to the houses. The vertical connectors play an important role. The concept of a hierarchical entry and a spatial sequence of approaching the houses are not observed. The single corridor creates a monotonous linear single outdoor space rather than a series of spaces with variations in scale and function. No major public or semi-public spaces are created. The role of vegetation, trees to create a sense of place and security to the houses is not present. Corridor act as the only form of public space. The concept of "medulla" or yard or even a front verandah space is non-existent. There is hardly any hierarchy in spaces observed in the settlement (Fig 06).

Fig 6: Hierarchy of spaces to access the houses in the new high-rise settlement.
Source –Author

Observations made on spaces for interaction & privacy

Observations were also made on the functions that took place along the pathways to the houses. In the case 1, three types of spaces were observed as spaces where interaction took place. Also such spaces show an impact on privacy levels. The spaces were Public space, Semi-public spaces and Connectors spaces. Each of the identified spaces have significant characters which either enhances the interaction or privacy.

The pocket spaces were identified as public spaces where most of the interaction happens. These are small open spaces shared by a group of houses and which is used as a gathering space as well as for commercial activity. Small front yards can be defined as the semi-public spaces where visitors are met and greeted and the leisure activities among families take place. Alleyways always act as connectors which create the linkage between spaces and also form functional spaces for interaction and separating spaces for preserving privacy between one space and the other.

In the case 2 the only space that could be identified as an interaction space was the shared corridor. Rests of the common spaces are totally misused or are inappropriately designed. Those are the staircases, bottom of the light well, corridor ends of the upper floor.

Objective 02: Evaluating satisfaction of privacy and social interaction in the neighborhood with respect to spatial hierarchy

Axial Calculations: First the Axial maps were done and the high integrated and low integrated spaces are identified based on the axial calculations (values). In the low rise – three high integrated spaces namely locations; 14, 19 and 6 are identified and two low integration spaces, locations 5 and 13 are identified. In the high-rise case three high integrated spaces namely 3, 6 and 7 and two low integrated spaces namely 1 and 9 are located (Figure 7). The locations with the activities of people are then verified, using in-depth interviews of selected owners of houses. Results are marked in an activity map where general observations are also conducted when drawing the activity maps.

Activity Maps: in addition to axial maps, activity maps were constructed using questionnaires to understand the most used spaces within the settlement. Figure 8 below shows the areas where high and low levels of activity takes place and hence the selected zones for further interviews on user perceptions of social interaction and privacy among residents living in such zones. This selection is done based on axial maps and activity maps.

Interviews: In order to identify how the spatial arrangement makes an impact on their social interaction and their privacy. The interview is done for 5 families for each case. The families are selected from the high and low integration zones as shown in table 2 above. The semi structured interview questionnaire focus on arrangement of private spaces and public spaces, its spatial integration and its impact on their social interaction and privacy. The questionnaire is based on information in four areas; 1. General (Age/Gender/Occupation/Education); 2. Residential (Living in the city/Change the environment of the residents/house appearance) ; 3. Interaction (sharing/houses open to public/satisfaction about the building/satisfaction about the outdoors/ Satisfaction about the circulation/neighbourhood safety); 4 Privacy (personal/family/visual/community/safety). The interview results were presented and analysed using word clouds as shown in figure 09 below.
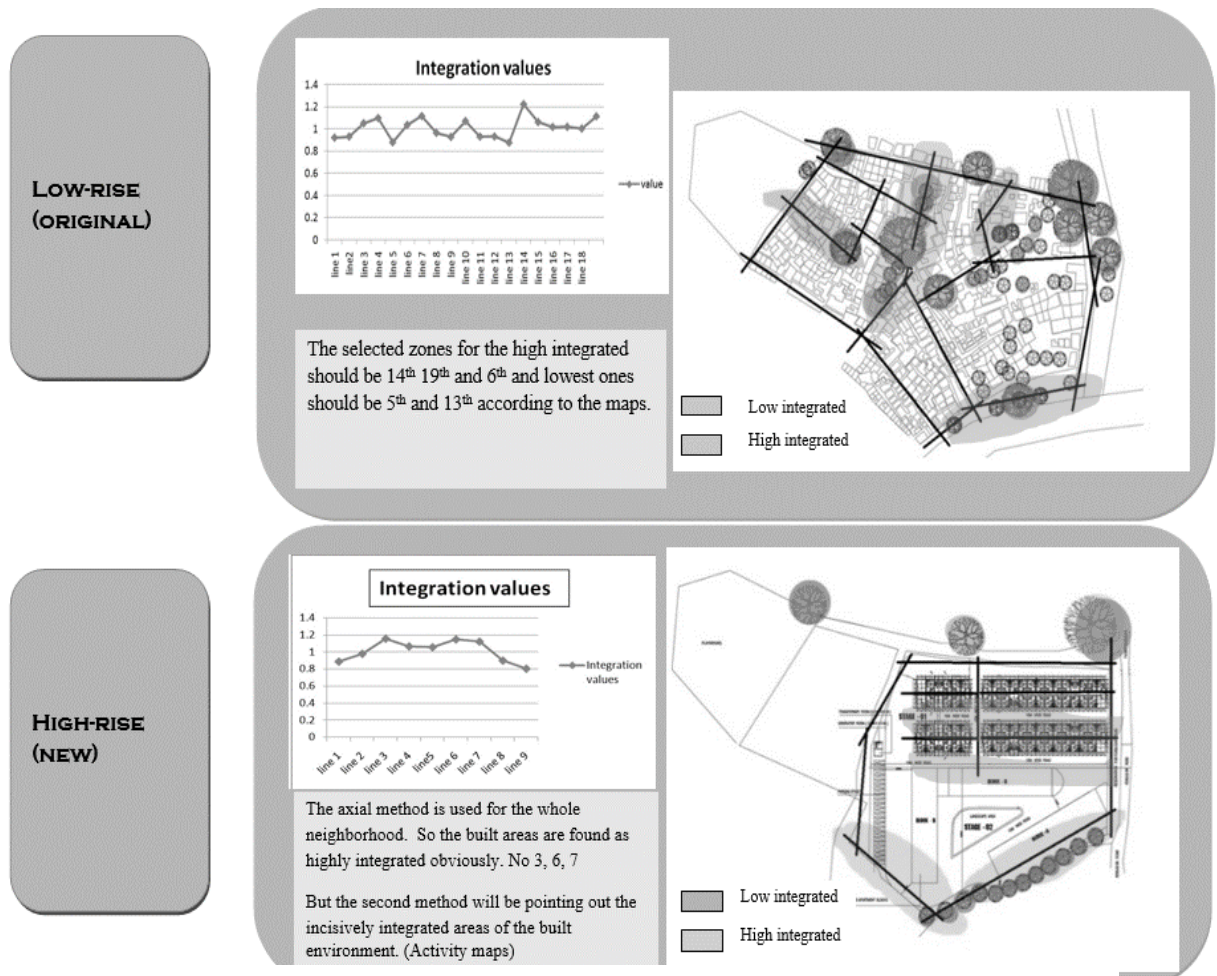
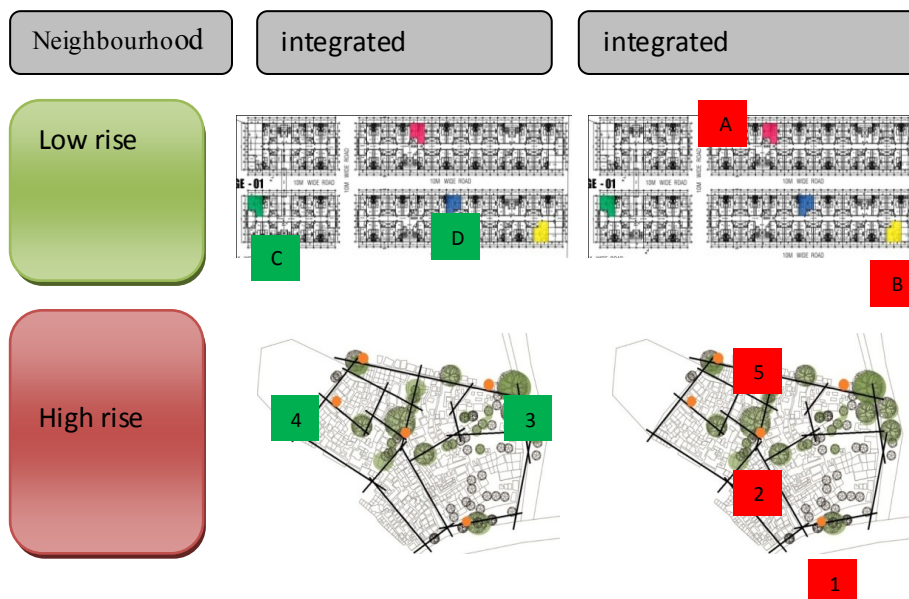**Fig 07-** Analysis of integration and segregation with the results from axial maps

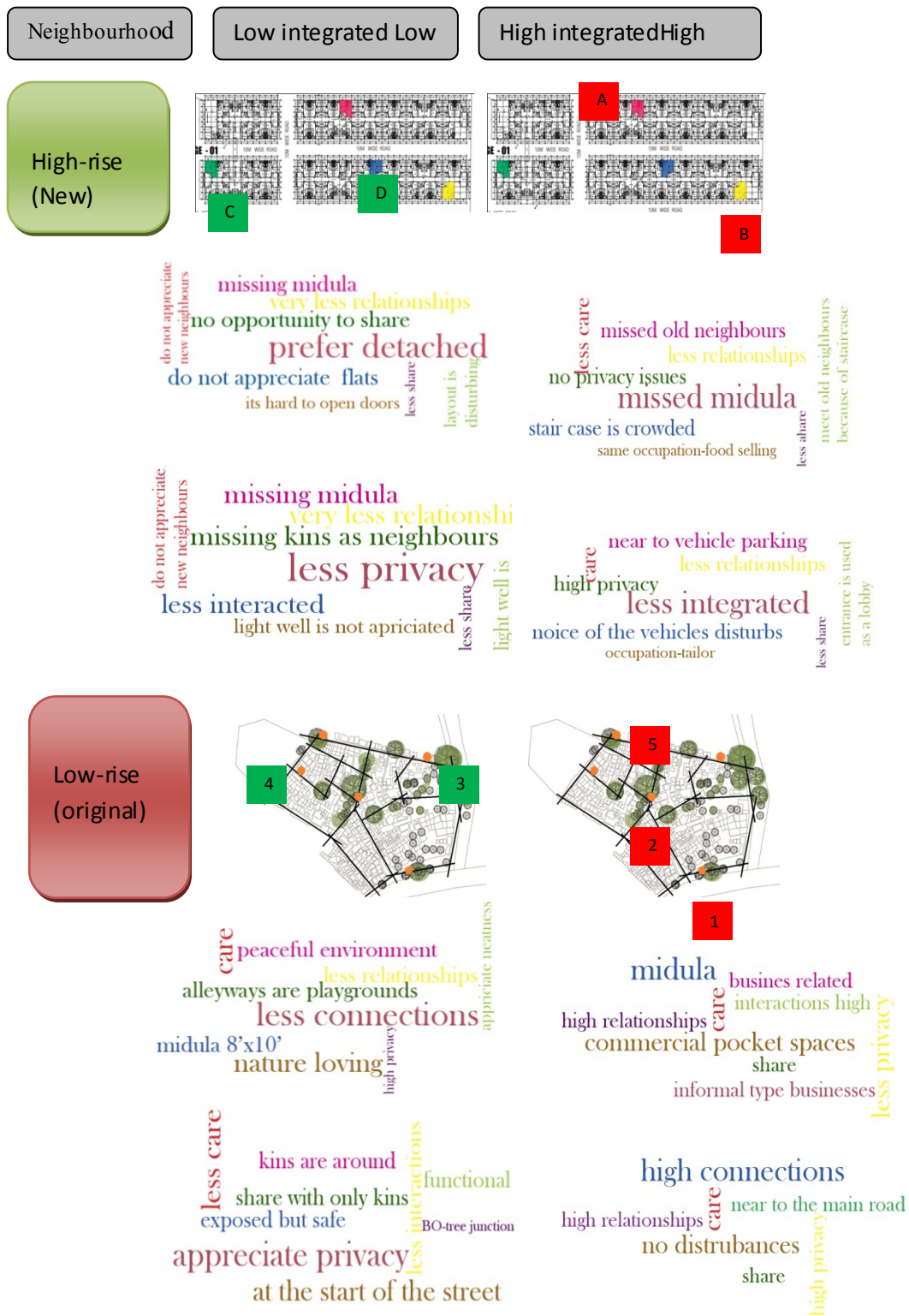**Fig 08**- Selection of zones for interviews based on integrated and segregated zones

Fig 09: Word clouds of interviews done in the selected high & low integrated spaces

According to the study, the objective 2 has finally resulted with some findings about places in

the original user generated neighbourhood. Some of these places have significant characters which help to enhance social interaction and some of these help to increase the privacy. The places are mentioned by the occupants live here. Spatial characteristics such as Shared open spaces, Pedestrian circulation, Corridors, pathways or alley ways and Centrality of the common house observed in the original low-rise settlement result in functional characteristics such as better Permeability, Safety, Flexibility, Adoptability for change, Richness of activities, Connectivity and Accessibility. Such characteristics encourage sense of interaction among the community which is also represented in the interview analysis. The spatial observations such as Territory building, Personal space building observed in the low-rise original settlement further encourages better sense of privacy.

The important spaces are Pocket spaces and Small front yards "Midulla a commented and mostly mentioned space by the occupants. This is more towards private territory. This space is used for gardening, visitor meetings, leisure activities and semi private type gatherings like talking with neighbours. In addition Alleyways: connector spaces are small pathways which are divided even further when going into the deeper spaces of the settlement and Public spaces also play a major role in enhancing a spatial hierarchy in this settlement.

The new settlement which is a high-rise is absent of the above spaces and spatial arrangements. There is no spatial hierarchy and hence the interviews also represent a sense of dis-satisfaction in privacy level, interaction and relationships with neighbours. The only opportunity to interact is shared corridors. Other identified spaces such as staircases, light wells and corridors are totally misused and inappropriately designed. A summary of findings are show in table 1 below.

Table 01: important spaces for spatial hierarchy in low income settlements

SPACE	POSITION IN THE HIERARCHICAL ORDER	EFFECT ON INTERACTION	EFFECT ON PRIVACY
1. Pocket spaces	Semi public	• Pocket spaces creates room for communicate with each other. • Connectivity, accessibility, permeability, safety, adoptability to change are the qualities identified in these spaces. • Verbal intercourse is prominent.	• This places limits who enters to the space. • The spaces are shared with group houses. • Small grocery shops, tea shops are significant elements in these spaces. • Spatially it is organized. This limits privacy around.
2. Small front yard (midula)	Semi private	• **Most commented space. Most of the houses have this space.** • Verbal and non-verbal connections are both used to communicate. • Very adoptable. • Safety factor is high. • Visual connectivity is another medium to communicate in this space.(can communicate with the neighbours who are passing by)	• Built to convey the territoriality. • Helps to keep the personal space safe from outsiders by creating an semi private space to interact with neighbours(outsiders cannot see inside through the windows) • Less accessibility to the outsiders(margined by a a fence)
3. User generated court yards Based on trees	Public territory	• These spaces corporate for high connectivity and interaction. • Accessibility, safety, flexibility, richness of activities, adoptability for changes are the significant qualities. • Mostly verbal communication is prominent.	• Minimum privacy in the space. • Most of the houses complain about privacy issues near to their places. • But they tolerate that considering the advantages.
4. Alleywas	Connectors (public)	• Flexible than a concreted corridor. • Safe • Richness of activities are high. • Very good connectors (have short cuts) • Accessible from very point. • Interaction is high. (Used as a play area sometimes.) • Verbal connections are mostly happened.	• These "connective alleyways" is a positive effect for privacy because every occupant lives in this community has a barrier space which is called "Midula".

3.0 Conclusion

The social relationships and ties between individuals in a community, is reflected in the spatial structure and vice versa. Such implications are most significant in the case of the urban poor, where the community bond and interdependency is very high. This study is focused on the critical need for understanding such relationships and enhancing such relationships when relocating and resettling the urban poor.

In the case of the original low rise neighborhood, the informal nature of outdoor spaces, alleyways, streets and lanes, break down the spatial structure and creates a spatial hierarchy. This informal spatial organization regulates privacy levels while encourages social interactions. The pocket spaces and the alleyways enhance social contact through informal activities such as commercial ventures and social gathering, etc. The alley ways regulates the connectivity, visibility, utilization of the community. Respondents show positive feedback on their settlements and connections with the community. In the new high rise, the informal spatial structuring and the hierarchy are absent. There is a lack of spatial structuring. The analysis of integration levels also shows that the 1st case which is the original low-rise settlements has a higher number of integrated spaces due to the large number of alleyways that connects one space to another as oppose to the high-rise option with single corridors as connectors. The results confirm that inhabitants find the original settlements and its spatial structuring, more conducive to their living patterns compared to the resettled neighborhood spatial structure. Negative spatial structuring such as; functions being disconnected with corridor; corridors not allowing for social activity is not conducive for the community.

It is suggested that the ends of corridors can open up to common spaces and gathering spaces. Major circulation nodes such as stairways and lifts are to be designed as gathering and social spaces; nodes for interaction and commercial/economic activity etc. Most blocks are linear and formal in its spatial layouts. A more clustered form and layout can generate more opportunity for contact and avoid long linear corridors. Centralized spaces with volume and space for social activity can enhance the community spirit. The scale of the neighborhood is also suggested to be more fine grained where the community is able to contact with their neighbours at human scale and build relationships rather than anonymity; connectedness rather than disconnect. Upper levels also can be nourished with public gathering spaces. To achieve privacy from public to private in the high-rises is also an issue. Creating small front yards (semi private spaces) is also a solution. The suggestions will be helpful as a knowledge base to improve future projects when housing the urban poor in mid-rise or high-rise housing. It further highlights the importance of the intermediate spaces such as a variation in semi-public spaces and pathways. Such spaces must be demonstrated in any development that is housing the urban poor.

Only the outdoor spatial hierarchy is discussed in this research and the indoor spatial hierarchy is not examined. The indoor spatial hierarchy is another area of study that can be perused in the future. Understanding the preferred spatial patterns and relationships in the indoors of houses can generate optimal layouts for future resettlements. Such can enhance the family relationships, and build more engaging communities as well as avoid dissatisfaction of housing layouts, modifications and changes and unnecessary misuse of resources. Living and the lifestyles of the urban poor can be uplifted by the spatial organization; so further studies can be set out to study the impact of spatial hierarchy on social mobility.

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