Independence and Interdependence of Sustainable Spaces

SPATIAL CONFIGURATION AND NEIGHBOURHOOD CHARACTERISTICS' IMPACT ON ACTIVITIES IN INFORMAL SPACES: A CASE STUDY OF BADULUPITIYA INFORMAL SETTLEMENTS IN BADULLA

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Abstract. Spatial configuration plays a role in the formation and types of neighbourhood activities. The common in-between spaces in an informal neighbourhood plays an important role in sustaining socio-economic networks and activities within the neighbourhood. The spatial configuration can create and enhance these activities and networks among its residents. This research investigates the spatial configuration of urban, dense, self – organized (informal) neighbourhood in Badulla and the activities generated within these spaces. It explores the positive social networks and interactions impacted by spatial configuration. Systematic observations, user perceptions, and space syntax is used to explore activities in space, the quality of space and the spatial configurations . Research findings show that necessary and social activities are dominant in spatially integrated space which are also visually and physically accessible, connected to the neighbourhood and commercial activities with high levels of surveillance. While optional activities dominate the spatially segregated spaces study also shows that these spaces are also socially disconnected with poor land use mix, links to residences, and low visual connections with other buildings. Physical characteristics further deterred these spaces from being socially and physically active. Even though functions that encourage social and active activity types are located in these spaces, such as play areas, playgrounds, these spaces are underutilised. Study shows that the physical chracteristics of the spaces also play a role in generating different activity types and nature of activity. Generating spaces with more surveillance, connectivity to other land uses such as shops, and houses and higher visibility can encourage more social activities even in the segregated spaces. The ad-hoc street side spaces and streets, lanes, alleys have become the major social spaces in the neighbourhood. Designated social spaces must be spatially integrated with a higher visibility, and accessibility to residential, commercial functions for better utilisation of those spaces.

Keywords: Spatial Configuration, Neighbourhood activities, Space syntax, Open common Spaces, Urban, informal neighbourhoods

1. Introduction

The informal spaces, in-between spaces within informal neighborhoods plays many roles and contributes to the socio-economic, social interaction, safety within the neighbourhoods. It facilitates the activities within the neighbourhood that fosters good neighbourhod ties. These spaces act as vessels and catalyst for sustaining the communal spirit of the neighbouhood and serves even functional purposes. When communities from such neighbourhoods are shifted into formal designed neighbourhoods, often hese spaces, their relationships and requirement for spaces that facilitate neighbourhod ties, social interactions and socio-economic activities are ignored and overlooked. The layouts, the informal spaces, the inbetween spaces are completely changed, and most often communities are unable to adapt and continue their day to day activities, social, economic networks within the new neighbourhood. Hence the careful study an understanding of these unique relationships is important especially when housing underserved informal communities in urban mass housing. By understanding of the relationship between neighbourhood activities and spatial configuration, design consideration guidelines can be generated for future mass housing.

1.1. AIMS & OBJECTIVES
This study aims to explore the spatial configurations, neighbourhood charateristics and activities in informal spaces within neighbouhoods, to shed light on the impact it makes on the nature and tyes of activities.

OBJECTIVE   1: The spatial configurations are done through space syntax mapping,

OBJECTIVE   2: neighbourhood charactersitics and activity types, its nature are explored by a systematic observations and resident's perceptions.

OBJECTIVE   3: The highly segregated and integrated spaces are compared across the types and nature of activity present and the oservatiosn made on the neoighbouhood characterstics. Further residents responses are explored to establish the spatial configuration and charcatersitis conducive for geerating and sustaining activity in informal neoighbourhood spaces.

Findings will contribute to a better understanding of neighbourhood informal spaces and activities and the important neighbourhod charaterstics to sustain neighbourhood activity.

2. Outdoor open spaces and neighbourhood activities

Outdoor open spaces play an important role in cities and neighbourhoods as a facilitator for urban activities, and a link between buildings and infrastructure. When effectively designed and managed they offer opportunity for interaction and exchange in places where people live and work. The urban design, planning and Architecture plays an important role in creating these outdoor spaces and making them secure, inviting, encourage social interactions and enjoyment. According to Zhang & Lawson, (2009) social interaction in high-density residential communities is beneficial to local communities and assumed to help them cope with stress. People turn to each other in coping with stress, and open spaces can facilitate that. According to Gehl (1987), if people spend more time outdoors they meet and interact more frequently. The physical contacts between people are dependent on the frequency of visits and the duration of stay in public space. Research findings of Zhang & Lawson, (2009) shows that social contact is a critical problem in high-density residential communities and community design can influence the level of social activities. They also state that activities in residential communities differ from general public outdoor space.

These outdoor spaces may have a private or public or semi-public nature to it. Semiprivate space is commonly defined as outdoor area surrounding and in-between buildings in residential areas (Ford, 2000). But these spaces can also be used by a large number of people and because the word public refers to a large number of people, such spaces have the characteristics and principles of public space (Madanipour, 2003, p. 1109). Shonfield (1998) expands the notion of public space as "any site that persons use when they are not at work or at home,". In this study, 'public outdoor space' is defined as; outdoor spaces near residential units which are open to residents and may or may not be patronized by the general public.

2.1. ACTIVITY TYPES
The activity that takes place in public spaces plays an important role in the making of a successful urban space. Gehl (1987) classifies outdoor activities into three groups, based on their levels of social contact, namely: necessary, optional and social activity.

Necessary activities: activities that are necessary in day to day life such as, getting to public transit, strolling across open spaces etc. When considering the everyday tasks, walking to work or school, getting the mail, or walking a dog can be identified as examples. According to Gehl (1987), these activities would take place in all types of weather and throughout the year since the participants have no option but to attend in this specific category of activities.

Optional activities: these are activities that people engage based on their choice such as going for a walk to get some fresh air or standing or sitting outside to experience the city. Optional activities compared to required ones are unlikely to take place in bad weather. Rather, optional activities take place when outside conditions are ideal, especially if the weather is nice. In here, the frequency of optional activities can also be impacted by factors other than the weather. Low-quality optional activities are available at a minimum in densely populated urban areas.

Social activities: when the quality of the outdoor area is environmentally conducive and of high quality, people will stop, sit, and play. Children playing, friends conversing, and passersby briefly recognizing each other are examples of these types of activities. These particular activities are frequently spontaneous and can be occurred in several circumstances. Further, according to Gehl (1971), such activities are "resultant" because they frequently evolve from the other two categories as people in the same place interact, even if only momentarily. Social activities, like optional activities, are influenced by the physical context of the area. Social activities occur when necessary and optional activities are given better conditions in public spaces (Moirongo, 2002).

Activities are also divided as "active" and "passive" activities. The difference between the two is that active activity requires a lot of energy and movement while passive activity is calm, less energetic and a relaxed activity.

3. Factors that influence neighbourhood activities

3.1 SPATIAL CONFIGURATION:
Spatial configuration is defined as a progress of self-build process here shows how cultural living patterns distinguish both the built shape and the spatial configuration." (Hasgul, 2019). Configuration of space has a cultural meaning which relates with the everyday life living patterns. The objective of the spatial configuration becomes fundamental to understand the social logic of a settlement (Hasgul, 2019). While examining the physical configuration of the space, the other way is to see the social configuration of the space which has a two-sided relation.

Kim (1999) has divided the spatial configuration into two groups: one is the spatial cognition and the other is the spatial behavior. The theory's cognition work is concerned with how the configuration of space affects human perception, whereas the behavior study is concerned with how the configuration affects human behaviors in space (Kim, 1999). Spatial configuration interacts with humans. This can be separated into two categories: physical space development and social experience of the individual self (Hasgul, 2019). In relation to these two subjects, the issue of patterns of space and patterns of culture arises. As a result, some designs have been evaluated and comparisons have been performed using space syntax diagrams. The relationship between spatial and cultural trends can be studied by spatial configuration. These findings can be presented in light of the space syntax research, which defines spatial configuration as the comprehension of the social dimension in the human context.

3.2 SPACE SYNTAX METHOD

The use of space syntax to identify and read the spatial configuration of urban environments has been described by B. Hillier & Hanson, (1988). Rather than a generic definition, the method of spatial arrangement explains the patterns of space in more complex terms. Space syntax is a program that investigates the relationship between human societies and space. It explores the structure of inhabited space and diverse forms of buildings, settlements cities or even landscapes. Patterns of connection, differentiation and centrality of urban systems and relationships can be analyzed through space syntax (Bafna, 2003; Peponis, Ross, & Rashid, 1997). "Space Syntax is a system of understanding the social relation in human environment." (Hasgul, 2019). According to Husgul (2019), space syntax is known as a geometry-based analysis of the spatial layout of environments and can be utilized to assess the configuration both at the city and interior levels.

Using space syntax method, the spatial configuration of the neighbourhood and the relationship between different spaces can be explored. In the first step the analysis represents the urban fabric as a pattern of spatial relations, particularly direction, incidence and connectivity (Peponis et al., 1997). All parts of the urban fabric are covered using axial maps that comprise fewest and longest lines. The number and length of lines indicates the degree of connectivity between parts of the system in terms of accessibility and visibility.

Peponis et al., (1997) describes Space Syntax in three essential steps:

(1) Spatial patterns are represented as linear elements of potential movement or convex elements of potential togetherness.

(2) Systems of relationships are described according to the permeable adjacencies of convex spaces, the overlap of convex elements, or the intersections of lines -linking elements according to the intersections of their "isovist" has also been practice, following an adaptation of Benedikt's (1979) ideas.

(3) Graph-theoretic measures, such as "connectivity", "integration", "intelligibility", and "choice" are applied to the systems of relationships thus established.

"Space syntax is a set of approaches for the representation, quantification, and interpretation of spatial configuration in structures and settlements," Hillier, Hanson, and Graham (1987, p. 363). In general, configuration is described as "at least the relation between two spaces that considers a third, and at most, the relations among spaces in a complex that consider all other spaces in the complex" (Peponis et al., 1997).

The spatial structure of cities and communities is investigated in space syntax by modeling their network of spaces, or land area not designated as structures, like streets, squares, roads, pedestrian routes, and parks, among other non-built-up places in a specific location.

3.3. INTEGRATION & SEGREGATION

3.3.1. Integration:

The key property of axial maps is integration. 'Integration' is the basic idea of space syntax. Integrating spaces enables different activities and categories of people to function together or side-by-side. These spaces are located in a manner that it provides linkages between other spaces. One space will have access to another with more than one route between he spaces. These spaces are able to receive a big share of activities from the neighbouring spaces (Moirongo, 2002). According to findings of Moirongo, (2002)human activities are more prevalent in integrated spaces and they encourage the flow of same activities throughout the urban structure, with continuous human surveillance unlike in the segregated spaces.

The distribution of integration throughout an urban region is thought to be related to the travel pattern in that area. Various levels of integration can be used to differentiate and compare urban areas. For urban areas, integration is utilized as a quality indicator. Integration measures the relationship of each line to the network as a whole. The integration value of a line is a function of the minimum number of other lines that must be used in order to reach all other parts of the system. Differences in integration can be shown visually and possible to represent in numeric numbers (Peponis et al., 1997).

3.3.2. Segregation:

The term "segregation" refers to the separation of functions and groups that are distinct from one another. This separation can be in the visual or physical form (Moirongo, 2002). These spaces are known to be "hidden" in the settlement or "deeply located" in the settlement and has no direct links with area surrounding the settlement where one has to pass through one space to the other. such spaces are deeper and segregated from the system (Moirongo, 2002).

A segregating space refers to one that has the ability by virtue of its location or definition to separate functions and groups that differ from each other, for instance, the inhabitants from the strangers. The separation can be in visual or physical terms.

3.4 NEIGHBOURHOOD CHARACTERSITICS

According to the study on public spaces and human distribution by Moirongo, (2002), he shows that the physical environment has influence on the mix of outdoor activities. It can influence the activities to a varying degree in many different ways such as assemble or disperse, integrate or segregate, invite or repel and the quality of outdoor space determines and influences the type of outdoor activity, its duration of use, frequency of use etc.

Zhang & Lawson, (2009) show that the relationship between buildings and outdoor spaces has an impact on the level of social activities generated in those spaces. The connected functions such as cafes contribute significantly to social activity in the outdoor space as oppose to location, landscape, size and form of the outdoor space. The number of buildings adjacent to the open space and also accessible and those not accessible to the space will also impact the activity types in the open space (Moirongo, 2002). Adjacency and accessibility of buildings to the open space will play a role in generating activity. Often the focus is on form making rather than the activities in public outdoor space and does not emphasize on social activities (Lozano, 1990). Mixed-use public space, will not only recognizes social variety but also encourages citizens to participate in productive ways (Jacobs, 1961). Although zoning is popular in modern urban design it separates people into homogenous groups resulting in poor social activity (Zhang & Lawson, 2009). The land use mix, urban ecology or formation, density, urban furniture and infrastructure also determines the human activities in open space(Moirongo, 2002).

4. Methodology

A mixed method approach is used for the study. A single case study was selected for the study. Within the case three zones namely; Zone A, Zone B and Zone C were identified for the field work and data collection (Figure 02). These housing settlements were picked because they feature a variety of layouts and designs, and they are located in the same context of Badulupitiya, Badulla, Sri Lanka. Especially in zone A, there is a unique character compared to the other two zones. According to the literature review, zone A can be identified as a row housing settlement. Zone B and zone C can be discussed under the cluster housing settlements. All these three zones have been identified as urban dense self–organized settlements.

Figure 02, Zone A: Satellite view of the case study location (Source: https://maps.google.com)
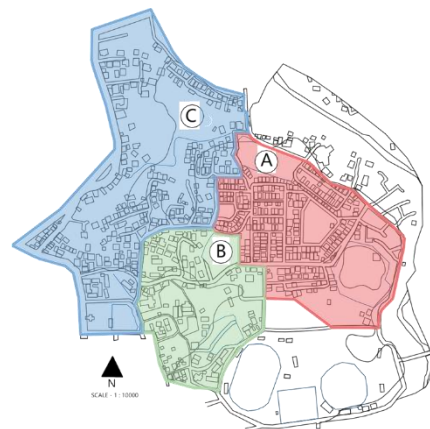

Figure 03, Selected Zones A, B and C (Source: Author)

4.1. DATA COLLECTION

The below diagram is identifying the key data that will be explored through the study. The theory defines the type of data such as "integrated" and "segregated" spaces are identified through the space syntax mapping. Further activity mapping was done to identify "passive" and "active" types of neighourhood activities taking place in the outdoors. The activities were further divided as necessary activity, optional activities and social activities under the "passive" and "active" activity types. Walk through interviews with residents were done to understand the use of space, the nature of user groups etc. Observations of the neighbourhood was done using a checklist to explore the physical

variables such as adjacency, land uses, impermeability, average height to width ratios of the space, presence of direct sunlight.
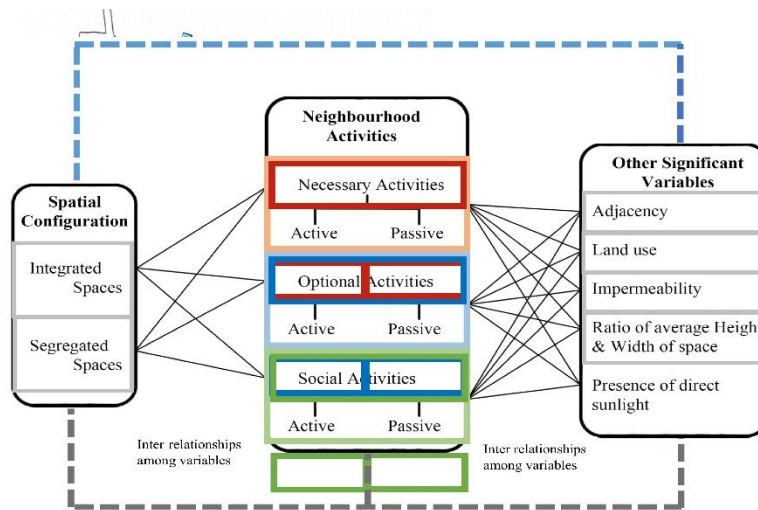

Figure 01, data types (Source: Author)

Table 1 below shows the data types and the appropriate data collection tools for the respective data.

Table 1: Data and data collection tools

Description of Data	Data collection Tools
Integrated and Segregated Spaces (spatial configuration)	• Space syntax mapping
Type of activity – necessary, optional or social activity. Nature of activity – Active or Passive User groups engaging in activity- male/ Female Age groups	• Activity maps • Observations and discussion with the residents • Walkthrough Interviews
Physical Characteristics of the Integrated and Segregated Spaces	• Systematic observations

5. Data Analysis

5.1. ZONE A- DATA PRESENTATION

The integration map is analysed to identify the hot spots- integrated and segregated space. Red colour shows the highest integration and dark blue shows low integration and high segregation. The colours in-between are light blue, green, and yellow, orange which shows a gradient of segregation-integration levels. The high integration and high segregation spaces, zones, streets are located on the map by referring to the space syntax map. Spaces A-1, A-2, A-3, A-4 and A- 5 are identified as significant noteworthy spots for analysis. There is a combination of both integrated and segregated spaces.
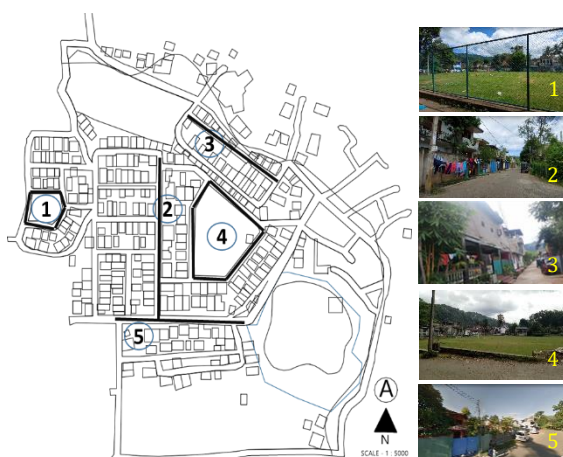

Figure 04, Zone A: Photo Study through systematic observations

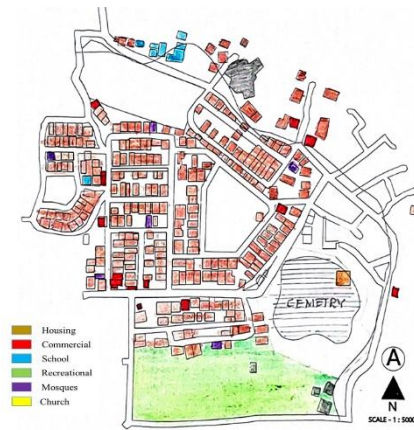Figure 05, Zone A: Integration & Segregation map (Source: Author)

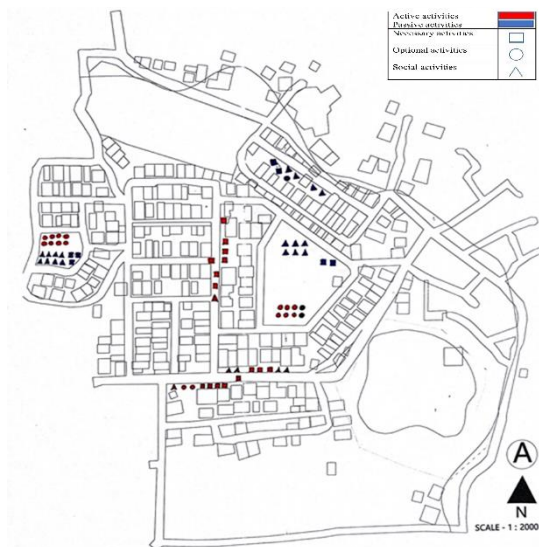Figure 06, Zone A: Land use map (Source: Author)

Figure 07, Zone A: Activity Map (Source: Author)

Identified space	Identified Activities	Activity	Type	Symbol
		Based on Liveliness	Based on Jan Gehl	
Space 1	Playing football	Active	Optional	●
	Playing cricket	Active	Optional	●
	Sitting on a bench	Passive	Necessary	■
	Sitting on a tree	Passive	Necessary	■
	Sitting together	Passive	Social	▲
	Watching towards ground	Passive	Social	▲
Space 2	Cycling	Active	Necessary	■
	Walking alone	Active	Necessary	■
	Walking together	Active	Social	▲
Space 3	Chat with neighbor	Passive	Social	▲
	Sitting together	Passive	Social	▲
	Playing carom	Passive	Optional	●
	Sitting on the half walls	Passive	Necessary	■
	Sitting on the bench	Passive	Necessary	■
Space 4	Playing football	Active	Optional	●
	Playing cricket	Active	Optional	●
	Sitting on a bench	Passive	Necessary	■
	Standing	Passive	Necessary	■
	Sitting together	Passive	Social	▲
	Lying down	Passive	Optional	●
Space 5	Jogging	Active	Optional	●
	Walking alone	Active	Necessary	■
	Walking together	Active	Social	▲
	Riding bicycles	Active	Necessary	■
	Shopping	Active	Necessary	■

Figure 08,, Zone A: Activity Categorization (Source: Author)

5.2. ZONE B- DATA PRESENTATION

Below mentioned two hot spots have been identified according to the integration map which is done according to the zone B. We can see the integration levels of this zone B as well. According to the integration map, slightly red colour shows the maximum integration and blue shows the segregation. With that understanding the above mentioned hot spots have been identified as Space B-6 and space B-7. A combination of both integrated and segregated spaces are present.
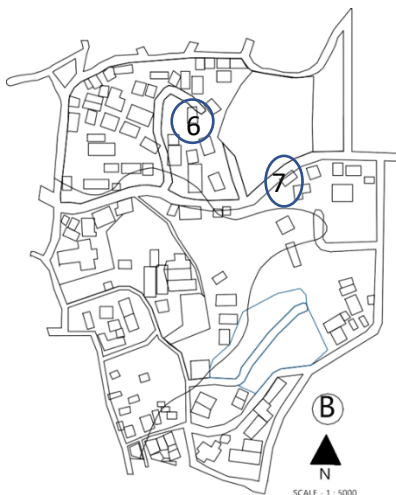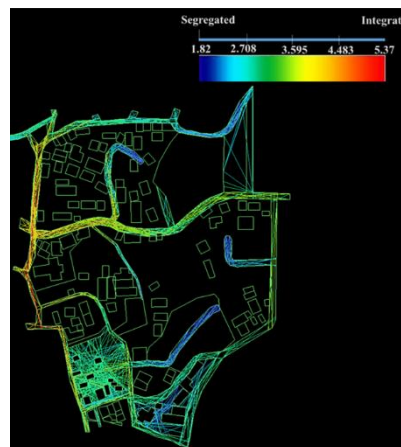

Figure 09, Zone B: Layout
(Source: Author)

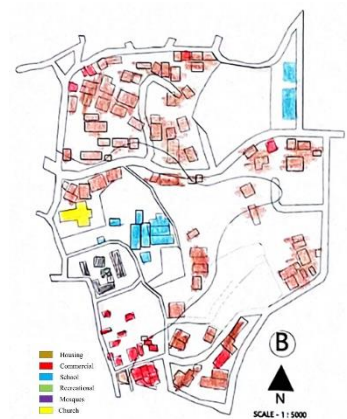

Figure 10, Zone B: Integration Map (Source: Author)
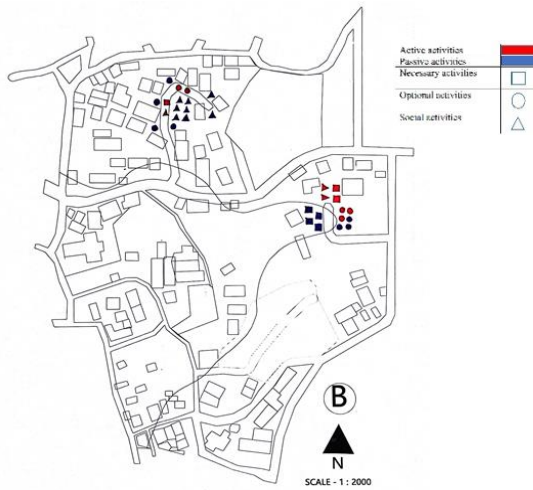

Figure 11, Zone B: Land use Map (Source: Author)

Identified space	Identified Activities	Activity	Type	Symbol
		Based on Liveliness	Based on Jan Gehl	
Space 6	Playing on the road	Active	Optional	●
	Cycling	Active	Optional	●
	Walking alone	Active	Necessary	■
	Walking together	Active	Social	▲
	Sitting on a tree	Passive	Optional	●
	Chat with neighbor	Passive	Social	▲
Space 7	Cycling	Active	Necessary	■
	Walking alone	Active	Necessary	■
	Walking together	Active	Social	▲
	Playing badminton	Active	Optional	●
	Sitting on a bench	Passive	Necessary	■
	Sitting on a tree	Passive	Optional	●
	Sitting and studying	Passive	Necessary	■

Figure 12, Zone B: Activity Map (Source: Author)   Figure 13, Zone B: Activity Categorization (Source: Author)

5.3. ZONE C- DATA PRESENTATION

The spatial integration of Zone C has been observed. According to the integration map, slightly red colour shows the maximum integration in this zone and blue shows the segregation. With that understanding the below mentioned hot spots have been identified as Space C-8 and space C-9 and space C-10. A combination of integrated and segregated spaces are present.

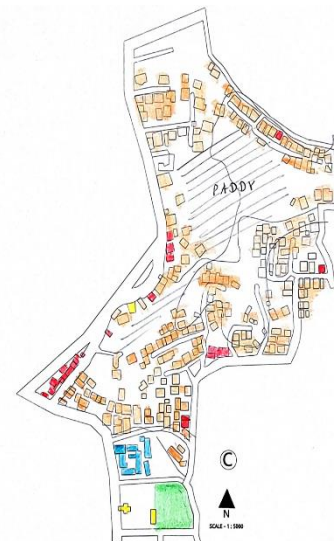Figure 14, Zone C: Layout (Source: Author)   Figure 15, Zone C: Integration Map (Source: Author)   Figure 16, Zone C: Land use Map (Source: Author)

Identified space	Identified Activities	Activity	Type	Symbol
		Based on Liveliness	Based on Jan Gehl	
Space 8	Playing football	Active	Optional	●
	Playing cricket	Active	Optional	●
	Sitting on a bench	Passive	Necessary	■
	Sitting on a tree	Passive	Optional	●
	Sitting together	Passive	Social	▲
	Watching towards ground	Passive	Social	▲
Space 9	Cycling	Active	Necessary	■
	Walking	Active	Necessary	■
	Chat with neighbours	Passive	Social	▲
	Sitting on bench	Passive	Necessary	■
	Sitting on trees	Passive	Optional	●
Space 10	Walking with dogs	Active	Optional	●
	Walking with kids	Active	Optional	●
	Playing badminton	Active	Optional	●

Figure 18, Zone C: Activity Categorization (Source: Author)

Figure 17, Zone C: Activity Map (Source: Author)

When comparing the overall zones A, B and C, the spatial integration maps shows that, zone A is more compacted with row houses and the other two zones are more dispersed with row houses and cluster housing with large in-between open areas. A higher level of social and necessary activities are observed in zone A, which is more socially integrated while a higher level of optional activities are observed in zone B and C which are more socially segregated.

A total of 10 both integrated and segregated spaces has been observed in all zones. Based on the above presented data it shows that out of the 10 spaces 3 spaces namely A2, A5 and C9 are spatially integrated while spaces A1, A3, A4, B6, B7, C8 and C10 are segregated space.

As shown in figures 19 & 20 below when comparing the distribution of optional, necessary and social activities across the integrated and segregated spaces the results show that, integrated spaces have higher percentage of necessary and social activities while segregated spaces have higher percentages of optional activities.
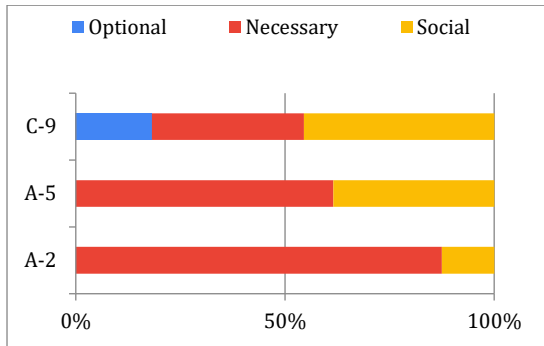

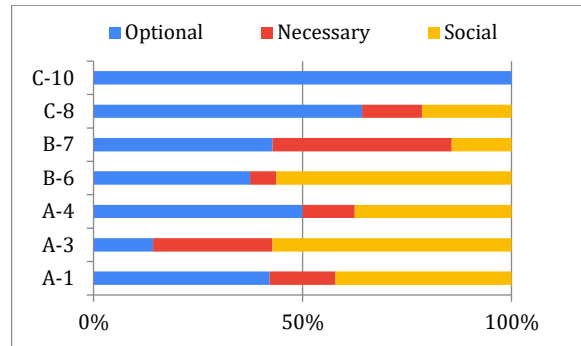Figure 19. Distribution of Activity types in integrated spaces (Source: Author)

Figure 20. Distribution of Activity types in segregated spaces (Source: Author)

As per figure 21 and 22, a comparison of the nature of activities show that "active" activity types are mostly distributed in integrated spaces, while "passive" activities are distributed mostly in segregated spaces.
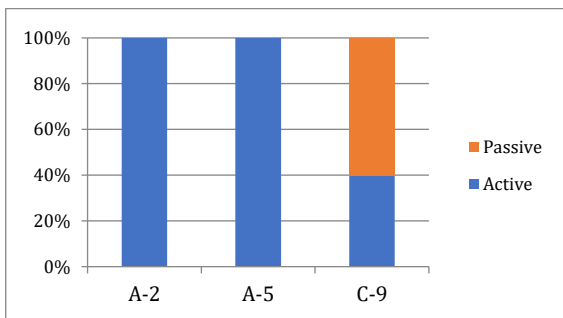

Figure 21. Distribution of the nature of activity in integrated spaces (Source: Author)
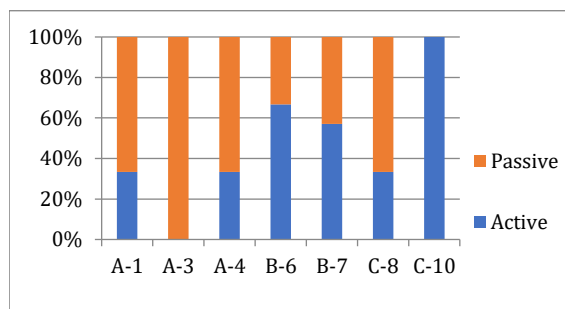

Figure 22. Distribution of the nature of activity in segregated spaces (Source: Author)

The study further observed the physical character of the spaces and the residents' views of the selected spaces. The table 2 below shows the characteristics and views of residents.

The social and necessary activities have thrived in the integrated spaces, which are also accessible physically and visually. They are also connected to shops and residents and offer a high level of surveillance throughout the day and nights. The integrated spaces have also created an environment for "active" activity types. Although such spaces are not designated for such "active" nature of activity or "social" activity the study shows that such spaces with a combination of an integrated spatial structure, land use, quality of spaces has encouraged these activities.

The segregated spaces are not only spatially segregated but also socially disconnected with no land use mix, links to residences, abandoned land and low visual connections with other buildings. Hence the physical characteristics have further deterred these spaces from being socially and physically active spaces. Even though functions that encourage social and active activity types are located in these spaces, such as play areas, playgrounds, these spaces are underutilised.

Generating spaces with more surveillance, connectivity to other land uses such as shops, and houses and higher visibility can be made to encourage more social activities even in the segregated spaces. The playgrounds located in some of the segregated spaces are spatially disconnected and isolated from the housing, hence it doesn't have the necessary accessibility and links from the core housing locations. Such spaces have become spaces that people will

use only as "optional", and they have not become spaces for day to day use of the community. Instead the ad-hoc street side spaces and streets, lanes, alleys have become the major social spaces in the neighbourhood.

When locating designated activities such as parks, pocket meeting areas, play grounds etc such spaces must be spatially integrated and a higher visibility, accessibility to residential and commercial functions are required, for better utilisation of those spaces.

Table 2: Characteristics of integrated & segregated spaces and views of residents

Integrated spaces	Segregated spaces
There are shops located in the vicinity. Wide roads are observed. The spaces are surrounded by row housing and the houses are in a compact form. The visibility and surveillance is high due to spaces accessible to residential and commercial functions and the activities in the area. The space is conducive for street related public activity and easily accessible to residents. The spaces are active with people at most ties of the day.	Commercial functions are not located in the vicinity. The area is mostly designated for recreational activities such as play grounds and parks. The spaces are surrounded by row houses as well as cluster housing. Several plots and areas are abandoned. There is less connection between those spaces and other road ways, alley ways and functions. The place feels unsafe and lonely due to the passive nature of activities, and people are observed in the space only at certain times of the day. Due to a lack in the links to other functions there is less surveillance and visual access from other buildings etc.

6. Conclusion

Spaces, spatial links, geographic distribution, and spatial order represented various people's attitudes, and it is beneficial for individuals to interact in accordance with their behavioral patterns. In general, spatial integration used space syntax to communicate the meaning of space and the value of the spatial architecture. There are some critical facts to be concerned about neighbourhood activities other than the spatial configuration, such as adjacency, land use, permeability, surveillance, accessibility, links and connections with residential areas. A combination of these has impact on the way inbetween spaces are used within a neighbourhood.

There are lessons one can learn from an informal neighbourhood, the types of spaces and activities in such spaces. Such an understanding will allow for future directions in the planning and design of formal neighbourhoods.

Most often in formal neighbourhoods spaces for recreation are located, with not much attention given to how such spaces will be used, or can be used. The ease of access and the attractiveness of such spaces for all age groups, at different times of the day etc are not considered. The study highlighting that designating spaces and area for recreation itself does not suffice, but its spatial configuration with other spaces within the neighbourhood and its physical qualities need to be addressed and thought through. If not the investment on recreational spaces maybe of a waste in the neighbourhoods where they becomes isolated, inaccessible spaces. Also large land parcels are used for these spaces, and if underutilised, it is not a sustainable manner to create neighbourhoods. Not only being unutilised, but also such spaces can result in, illicit, criminal activities and such factors will further isolate such spaces not only physically but also socially. Such spaces need to be patronised by all user groups, including women and children, the accessibility, safety must be enhanced. Being isolated from the rest of the residential areas makes such areas, lonely, unsafe and invariably deters the majority of the residents patronising them.

Study further highlights the importance of the integrated spaces, which will often be the spaces that are most connected, physically accessible to the residents and very much in the core –areas of the residential zones. Such spaces need more attention in terms of its habitability. The spatial configurations ensure that such spaces are spatially conducive, but improving the quality of these spaces, responding to the needs such as habitability, usability and provision of facilities encouraging social activity hence can further enhance these spaces making them ideal for social gathering, and use. Such spaces can be capitalized for its value as spaces for binding, creating communal values,

solidarity, and safety within communities which are very important for sustaining urban neighbourhods. Such social ties become the links between keeping neighbourhoods and its communities together, which is as important as the quantitative, physical requirements in terms of area allocations, etc.

7. References

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