

**CRITICAL ANALYSIS OF THE RELATIONSHIP BETWEEN
CRIME, SAFETY AND THE PHYSICAL ENVIRONMENT IN
NEW LOW-INCOME, HIGH-RISE HOUSING IN COLOMBO**

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Sri Lanka

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Dissertation submitted in partial fulfillment of the requirements for the
Master of Urban Design

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Sri Lanka

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Declaration of the candidate and supervisor

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Abstract

In Sri Lanka after year 2000, Many Low-income, high- Rise housing developments have being built to reclaim some of the scenic places in the city and to satisfy the housing demand for the growing Urban population. These houses are mainly concentrated in the north and east of Colombo metropolitan area. Due to the high concentration of low-income houses in these areas, and poor maintenance etc., these LIHRHs have developed a stigma. Most number of Crime Incidents of the city are also reported from these areas. Due to these Many residents who can afford it, move out of these newly built LIHRH worsening the situation due to these vacant premises been rented by gang leaders and drug lords. In the past Internationally, due to such problems, many such housing developments were demolished.

Extensive research work and theories were also developed in other countries as to how to avoid such crime breeding grounds in housing developments. Of these defensible space by Oscar Newman is the most accepted and widely adopted in controlling crime via environmental design. He discusses how this can be achieved under four main categories. First is via increasing territorial control by residents over their premises, second by increasing the natural surveillance of residents over their premises, third by improving the image of the housing development and thereby attracting users of higher income categories to the area and fourth how the proximity to safe places can increase the safety of the LIHRH. Jane Jacobs and some others theoreticians have also talked about different aspects that contribute towards reducing crime in housing schemes such as the presence of children playing in sidewalks and shops that keep natural surveillance over the streets in a neighborhood.

As a measuring tool for Crime occurrences and safety levels in selected case studies four main headings of Territoriality, Natural Surveillance, Image and proximity to safe and non-safe places were adopted. Under these other 29 subcategories were utilized to measure crime and safety levels in the case studies. Using these, Objectives of the study are to see whether there is a relationship between built form and crime in Sri Lankan context and if there is to see what can be done to the built form and the environment to reduce the crime rates and increase the safety in LIHRH.

Selected three case studies are Muwaduru Uyana, Sirimuth Uyana and Randiya Uyana. Ninety residents from the 3 case studies answered a questionnaire and drew mind maps of safe and unsafe areas of their LIHRH in the given maps. There were interviews of residents, UDA officials and police personnel and photographic survey was also conducted see how the three case studies fared in terms of the four developed main categories for crime and safety. In addition to these, a cartographic analysis was also carried out about the nature of built form. Crime data relating to the three case studies were obtained from the relevant police stations.

Police data indicated that Muwaduru Uyana was highest in crime second is Randiya Uyana and Sirimuthu Uyana had a smaller number of crimes. Sirimuthu Uyana was considered as the safest by residents. Survey observations also supported this data. Therefore, it was concluded that

- a. When the territoriality, Natural surveillance of the residents increases over their premises and image of the improves and LIHRH is located in proximity to safe areas crime decreases –Inversely Proportional relationship
- b. When the territoriality, Natural surveillance of the residents increases over their premises and image of the improves and LIHRH is located in proximity to safe areas Safety Increases –Proportional Relationship

Based on survey findings, possible improvements to the built form and surroundings of the three existing case studies and future recommendations to adopt in LIHRH were proposed under the four main categories of Territoriality, Natural Surveillance, Image and proximity to safe and non-safe areas. Under these 4 categories, 33 recommendations were proposed.

Acknowledgements

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I appreciate very much the assistance given by the UDA professionals, especially Archt. Udyani and Engineer Rajitha in providing cartographic information and data relevant to case studies and the three project managers of the case studies. Assistance given by OIC's of Dematagoda police station and Mihijana Sevena police station is much appreciated.

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LIST OF ABBREVIATIONS

LIHRH – Low – income, high- rise housing

CPTED – Crime prevention through Environmental design

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INTRODUCTION

Background to the study

After the Independence and the open economic policy in 1978 population of Colombo has grown due to local migration. This migration was mainly due to the better employment and educational opportunities that exists in the city. Land scarcity, Rapid urbanization and the lack of affordable quality housing for the blue-collar workers lead to development of slum/shanty dwellings in the city. This has led to development of “watta” – a Sinhala term defining a district of low income community. There are different types of “Wattas” in Colombo. Some are very clean and well-organized with active community-based help while others are full of crime and is made of unhealthy environment. But one common factor in these areas is the overcrowding. The ratio of no of people to square area of the house. Many of these “Wattas” were located within the city’s most scenic areas such as edges of oceans, rivers, lakes and rail roads. The government recognized in the 1990’s that this population is essential to the smooth running of many urban services since many of these residents were employed as house maids, drivers, as workers in the cleaning services, harbor activities etc. Therefore, a policy discission was made by the then government to relocate them within the city itself and free the land for urban and economic development. This led to a series of high-rise , low income housing to be built in Colombo, Sahsarapura in Borella being the first of them.

Subsequent studies have revealed that these high-rise housing have many short comings. Such as lack of space, no place for rituals, non-working of public amenities such as lifts, loss of economic generating space, loss of quality education, Lack/loss of community relationship and increase of crime and loss of safety. Of these, my study focuses on the aspect of crime and safety.

“The gigantic catastrophes that threaten us today are not elemental happenings of a physical or biological order, **but psychic events**. To a quite terrifying degree we are threatened by wars and revolutions which are nothing other than psychic epidemics.”

- Carl Jung

Above statement by Carl Jung illustrates what plagues today's urban societies. Crime that arises from a breakdown of mental, social and environmental relationships.

Habitat for humanity statement for the world housing day also illustrates that providing the space requirement for dwellings is not adequate. That they need to be Safe, decent, and affordable.

“I believe that everyone has right to safe, decent, affordable housing.”

- Habitat for humanity pledge 2012

Therefore, it is necessary to evaluate how safe are the high risers constructed so far for the low-income communities and whether there are ways we can make them safer in the future.

To make a place crime free and safe there are multiple factors that affect it. Such as the income group, number of perpetrators in the area and other political and social factors. While these exists, crime cannot be completely irradiated due to the human nature, certain changes to the physical environment can be made to make places they live to be safe for residents.

In the western countries many of the high-rise buildings that were built in the 1950, 60 were demolished due to a myriad of problems with crime been the main issue. Ex. Pruitt- igoe. They have resorted to mid-level housing from the lessons they learned from their high-rise development projects for low-income people. However, in Sri Lankan housing, we seem to be repeating the same mistakes those western countries made. Middle- and upper-income category people can afford to have door men and other security facilities installed in their high-rise apartments and these places do not have high crime rates and residents are generally satisfied with their housing developments. We do not have to make the same mistakes other countries made. We can learn from their mistake how to do things properly. Therefore, understanding those theories that were used in preventing crime in high rise apartments in other countries will be useful for Sri Lanka.

Most of these low-income, high-rise projects are located in the Colombo metropolitan area and future ones are also planned to be constructed in and around Colombo. Therefore, the projects from the Colombo area will be used as case studies.

The study will critically analyze the theories of physical environment and crime and safety in relation to Sri Lankan low-income, high-rise context and attempt to come up with what remedial measures can be made make the environment safe and crime free.

Research Gap

- a. Many studies on Low-income high-rise housing scheme have been carried out recently. They include a vast number of subject areas such as suitability of them as living spaces, placelessness, quality of building, sense of belonging in high-rise buildings, defining the edge, urban housing policies etc.
- b. Crime and safety in relation to neighborhoods has been carried out
- c. But a study of relationship between crime and the physical environment in low-income high-rise buildings have not been carried out.
- d. Many studies in this subject have been done in the international arena and many theories have been developed. But whether these are applicable in Sri Lankan context has not been looked at.

Research Question

Is there a relationship between crime/Safety and the physical arrangement of places and
If so what can be done to improve the safety for residents?

Research Aim/Objectives

The main aim is to Identify possible spatial arrangements, elements in the physical environment and procedures and considerations that will lower the crime rate in an area and make it safe.

Objectives -

1. Identifying whether in Sri Lankan low-income, high-rise housing (SL LIHRH) there is a connection between the created physical environment and the crime rates.
2. Evaluate SL LIHRH in the light of international accepted theories on creating a safe environment.
3. Recommend possible improvements to the existing physical environments
4. Propose a way forward in creating safe SL LIHRH.

Research methodology

Methods

Methods used to gather data are Data from the department of police, Photographic surveys, Questionnaire/survey of residents – descriptive analysis, Personal Interviews, Maps drawn by residents – evaluative analysis and correlations, Direct observations

Local case studies, Study of successful methodologies via literature, Analysis of internal and external plans in terms of crime occurrences and their, physical characteristics, Literature review of both published and unpublished work.

Methodology

This will be conducted as a two-way study. First part is a pilot study carried out by asking residents both qualitative and quantitative questions via a survey and mind maps, whether crime occurs in these developments and what are the areas that these crime happens. Crime data too will be collected from police to verify this data.

Second part is a development of a theory base to measure crime and safety via a literature survey and analysis of the physical environment via observation of actual situation and plans as per that. Then to find whether a correlation exists between the pilot study and the theory base. As per this outcome, Possible remedial measures to the physical environment will be recommended to lessen crime and to increase safety.

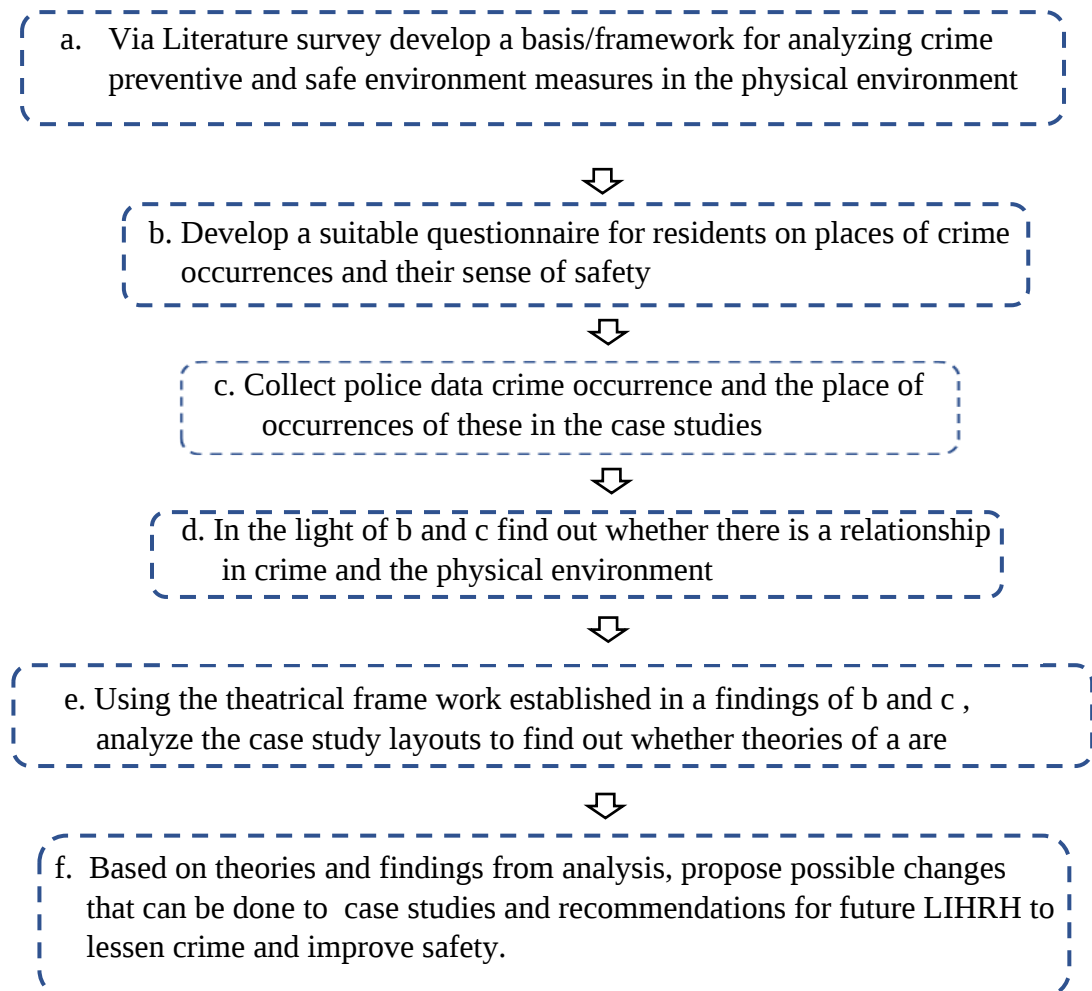


Image 0.1 Structure of Methodology

Research Scope and Limitations

Scope

- Study would be concentrated on Low-income, high-rise housing done in the 21st century in Colombo, Sri Lanka.
- On literature surveys there is wide range of discussion on the subject, therefore most accepted and proven theories will be taken into account.

Limitations

- New covid situation and its effect on built environment and criminals will not be considered.
- Crime records of last 2 years in the police will be less/more due to the covid situation.
- Interviews, viewpoints of Perpetrators will not be included in this study due to the difficulty of identifying and meeting a substantial number of them though this would have been a very enlightening to the study.

CHAPTER 01- LOW-INCOME, HIGH -RISE HOUSING

1.1 Global perspectives of the Low- income, high-rise housing.

In the 19th Century Europe and America went through the industrial age and with that, laborers flocked into the cities to work in new factories. This created a low-income community in very unhealthy housing conditions. Many Architects and planners that were dismayed by these conditions proposed alternative urban planning proposals. Urban planner, Ebenezer Howard's Garden city concept is one of the most influential among them and shaped many later thinking as to how housing should be provided. During the World War 11 many cities were destroyed and after the World War 11 there was an acute need for vast number of affordable housing units in healthy environments. Le Corbusier 's Radiant city concept was adopted by many government bodies and architects in fulfilling this need. But by the 1970s Many social problems occurred in these high-rise affordable housing towers due to their physical configurations. Many residents vacated these and most of them became places of crime and of uninhabitable condition. With the demolishing of the Pruitt – Igoe, as Charles Jenckes pronounces that “Modern movement died at July 15, 1972 at 3:32 PM (or thereabouts)” Many of these high rise, isolated towers were demolished in 1970's and 1980's. In Europe and America Walks up of 4 floors or medium rise housing blocks were built.

In America, under real estate entrepreneurs, American suburbia developed with infrastructure development and heavy reliance on car. Ills of LIHRH continued to plague American cities and subsequently the same problems occurred in some of the suburban developments. These developments and research work led to the understanding that there is a relationship between the physical environment and the frequency of crime occurrences. At present, America and Europe follows Various guide lines from CPTED (crime prevention through environmental design) handbooks when planning housing developments.

In southeast Asia urbanization accelerated after the war 11 in gaining independence from colonial rule. Inadequate awareness of new governments and multitude of other reasons led to vast areas of slums to develop in 1950s and 1960s in many south Asian

countries. Many countries launched resettlement of these communities and regaining some of these spaces. India has adopted many different approaches to this and of recent many high-rise developments were built.

Singapore, when housing Low-income communities has had strong political leadership and a heavy hand in handling landownership. Cohesive and ethnicity ratio-based housing has eliminated most of the crime and stigma that is associated with the public housing programs. Singapore carried out many cycles of housing. From 4 to 5 stories to 13- 14 stories and then to higher densities. Which allowed the residents to gradually get used to living in higher levels.

In comparison to other south Asian countries Sri Lanka's low-income housing conditions and available facilities are far better as reported in UN habitat country report of 2016. (UN habitat, 2016, p. 3)

1.2 Evaluation of high-rise Housing development in Sri Lanka.

Sri Lankan urban population has grown in the recent years exponentially. In 2011 it was 3.69 million people and now it is close to 4 million people as the below graph indicates.

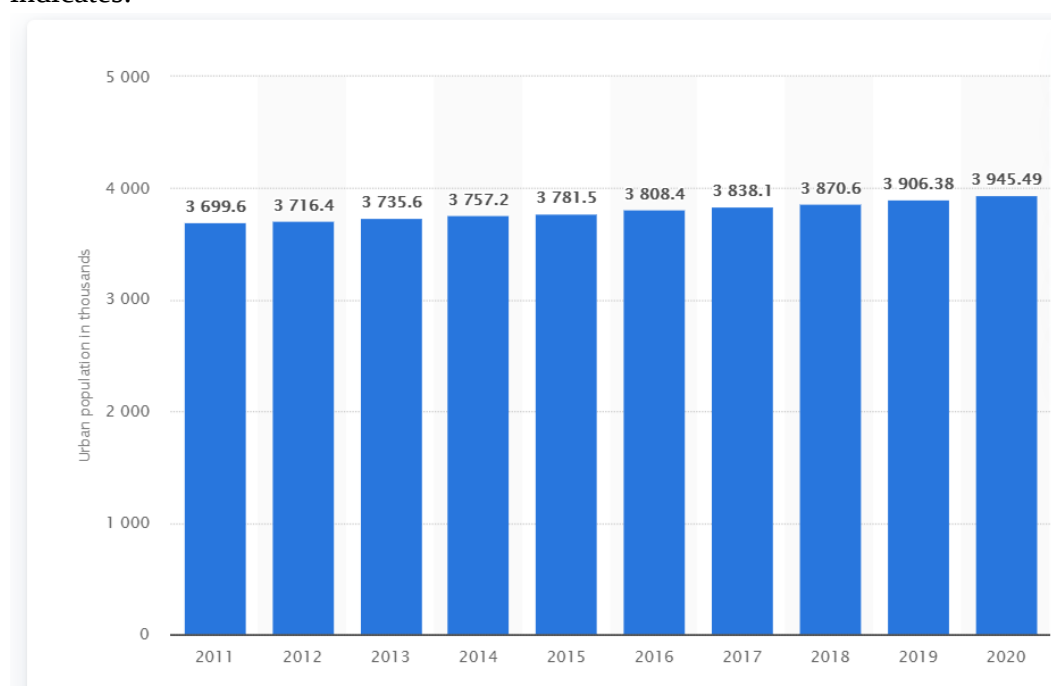


Table 1.1 – Urban population in Sri Lanka from 2011 to 2020 (in 1,000s)

(Department of Statistics, n.d.)

Of this population in Colombo city's population 51% lives in underserved area amounting to 68, 812 households in 2011.

As the demand for urban housing has increased in Sri Lanka, many methodologies were adopted by commercial banks to fill this need for the middle income and higher income groups via a series of bank loans. But for the low-income people these were not available due to pay back unaffordability, banks deeming them as high-risk category, non-availability of legal land for them, etc. Therefore, the Government has in the past used many methodologies to solve this problem.

At present, Sri Lanka plans to construct 35,000 urban high-rise dwellings within the next 3 years. This will affect the lives of many city inhabitants and the urban environment. Therefore, it is important to understand the possible pit falls of this and come up with possible methodologies to be adopted when constructing these developments.

First such intervention in Sri Lanka was in 1942 via the Rent Restriction Act (RRA) which curtailed the landlords from exploiting the tenants. Between 1948 to 1969 with the establishment of the National housing fund and the Department of National housing many housing developments of walkup and mid-level rise urban housing developments were carried out. Well known developments such as Anderson flats and Bambalapitya flats belong to this era. Most of these were for the middle-income families.

In 1970s many low-rise housing projects were carried out in the rural and fisheries areas with government's self-help schemes. In 1977, the summit flats were built as a middle-income housing project that was utilized for the Non - Aligned Summit Conference and later utilized as government executives housing and is one of the successful urban housing projects of this time.

In 1978 with the economic reforms in the country under the then prime minister R. Premadasa a new wave of housing development spread across the country. Housing ministry and the UDA were also established during this time. Projects such as Hundred Thousand Houses Program and One Million Houses Program were prominent housing initiatives that were carried out during this time. But most of these also targeted the

suburban and rural areas. EX: Raddalugama housing scheme. (1982) Mathethgoda housing scheme. Gunasighepura housing scheme (1985) was one urban housing scheme done in Colombo during this time which is a mid-level riser for lower middle-income families.

1.5 million housing program introduced in the 1990, Gam Udaawa of 1992 were other main housing initiatives taken by the government. With the intention of reclaiming some of the canal edges of Colombo and resettling the slum dwellers of the city, in 2001 'Sahaspura', the first high-rise low-income housing project was completed by Reel. This was the first high rise for low-income families with 671 housing units in 14 floors.

Thereafter many urban high-rise low-income community housing schemes has come up in the east Colombo metropolitan areas. Ex. Sinha pura, 'Mihindusenpura', 'Methsara Uyana', 'Sirisara Uyana' and 'Lakmuthu Sevana' (Mayura Place)

1.3 What is low-income housing

Sri Lanka's minimum wage is Rs. 10,000.00 per months as per the wages board in 2016 and is proposed to be increased to 12,500. (news.lk, 2021) Though this is considered the minimum wages, when considering the low income category it is much

Institution	Low Income	Lower Middle-Income	Upper Middle-Income	High Income
ADB	< \$2,000	\$ 2,000 to \$ 7,250	\$ 7,250 to \$ 11,750	> \$ 11,750
World Bank 2012 (WB Atlas method)	< \$1,035	\$ 1,036 to \$ 4,085	\$ 4,086 to \$ 12,615	> \$ 12,616
World Bank 2011	< \$ 1,005	\$ 1,006 to \$ 3,975	\$ 3,976 to \$ 12,275	> \$ 12,276

Table 1.2 - Classification income classes in year 2011 – income levels for one year ¹

¹ Wijesinghe Anushka, 'Sri Lanka's Middle Income Transition', Talking economics, 2013 <<https://www.ips.lk/talkingeconomics/2013/10/19/sri-lankas-middle-income-transition-thinking-beyond-the-optics-to-the-mechanics/>>.

Poverty line as defined by World bank is 3.20 dollars (670 SL rupees) per day. This is an average of 20,000 Rs. Per month. In these housing developments many families have an income level far above this defined cut offline. “Low income” is a termed used by many government agencies and development companies and in Sri Lankan context it does not really mean low income, rather a group of people that does not have adequate healthy housing and does not have savings. Their actual income levels sometimes may be even as higher as upper middle income. But it is their economic habits that makes them without surplus money for future events. Their housing is overcrowded, of unhealthy standard, visually unpleasant and there is stigma attached to the housing district. Sometimes there are very healthy housing environments that is not over crowded as well. But these housing are grouped together in what is called most times a “watta”. Some of these housing also occur in edge areas of the city such as railways and canal. Ownership of land has sometimes been given to them by the government and at other times they are squatters. There is also a wide disparity in the square footage of houses, from a 90 sq ft to 500 sqft and more even. But 2 common factors can be seen. They are the stigma and the visual unpleasantness attached to the overall housing area. This term “Low income” will be used in those terms.



Image 1.1: Disparity in low-income houses, a. two storied house in Vanthamulla. b. smaller house in Bodhirajamawatha

1.4 Problems associated with Low- income, High- rise housing in Sri Lanka

First People to be resettled in the Shasrapura housing scheme awaited eagerly to for their new homes. But after the novelty period had passed, residents faced the reality of the high-rise housing scheme and many found that the new housing did not facilitate their familiar life style. The adaptation to this new lifestyle was hard for many.

Subsequent housing developments also displayed the same shortcomings. Many of the people to be resettled had live stocks in their homes, mostly as chickens and some even had cows and pets. They found that there is no place for them in the new housing scheme and they had to be sold off. One elderly resident in the Sashrapura took the cow by elevator in the evening to be tied outside his apartment for fear of it been stolen.

Garbage disposal was another problem they encountered. They were not used to carrying garbage a long distance for disposal and with crowded elevators, garbage was thrown from upper levels to lower floors. This created an unpleasant environment for residents. People avoided such places. Some of the places dedicated for nurseries etc. did not function. Such things led to many isolated places in these housing schemes and crime and drug dealing were rampant in many of the new housing schemes.

Some of the people that were resettled, earlier had access to good schools due to their location and distance-based school admission system. This was lost to them in their new locations. These housing schemes also did not have places for their cultural activities and their known community bonds were also broken due to the system that was adopted in allocating houses.

Lack of maintenance and vandalism led to elevators been broken and residents of these apartments still has a hard time accessing the upper levels. Specially the elderly with broken elevators has become prisoners in their own apartments.

Previous Government policy has been to locate many of the LIHRH together and this with bad living conditions had led to stigma been attached to new housing schemes, discrimination in schools and when finding job opportunities. Due to the Stigma attached to LIHRH developments many residents move out as soon as possible by selling their properties. This has been a vicious cycle that keeps repeating.

Another alarming factor in recent LIHRH is inadequate light and ventilation for the public areas of lower levels. There is also no play area for children. Dark corridors and the sheer verticality of some of the new housing creates a very alien environment to that of which they were used to, thereby reducing social interaction with neighbors and venturing out into the neighborhoods.

Crime and lack of safety is one of the major issues of new LIHRH . There are many strangers or known offenders that roam freely in housing schemes. But residents are unable to prevent them from coming to their front door since many LIHRH corridors, lobbies are all public and residents have no right to ask why a particular person is waiting there. In Shasrupura , at the beginning of the project , at night time teenager rode on bikes along the ramps making it a noise and a security nuisance for residents. They were unable to say teenagers cannot be riding in their path.

There are also many hidden, dark corners also where a crime can occur unseen by others. Many strangers hangout around and residents are subjected to mild and severe harassment from them on their way and to from the apartment. This makes their living environment unpleasant for residents and when people can afford to find an alternative place, they move out. This in turn creates a population that is constantly in transit with very few permanent residents and permanent social bonds. Such housing schemes are full of crime and in society has stigma attached to them. Prevention of these is essential in providing a good physical environment for LIHRH.

Summary-

LIHRH is a recent phenomenon in Sri Lanka and Low-income communities are defined by the stigma and unpleasing visual conditions associated with them and not by their income levels. Newly built LIHRH in north and east of Colombo has reported many problems and among them crime and drug dealing are main concerns.

CHAPTER 02 – CRIME AND SAFETY

2.1 What is crime

Definition given by Websters dictionary for crime is as follows

“An act which violates a law, divine or human; an act which violates a rule of moral duty; an offense against the laws of right, prescribed by God or man, or against any rule of duty plainly implied in those laws. A *crime* may consist in omission or neglect, as well as in commission, or positive transgression.

Any great wickedness; iniquity; wrong.”

As per the above It is a criminal act. Sri Lankan Police records 26 types of crime. There are number of offenses that happen in a neighborhood Such as pick pocketing, Drug dealing, threat, extraction of money by force, Robbery, Murder, rape, vandalism, verbal abuse etc. These are of varying degree of seriousness, and all are not accepted by law as a crime. But such incidents create an environment for perpetrators to freely carry out their activities.

Though Minor vandalism and graffiti are generally ignored by police as minor offences they lead to an overall environmental decay.

Therefore, even if some of the above mentioned are not taken seriously by the police, this study shall take as crimes acts that a person willfully does to harm a person physically or emotionally or to a physical object and robbery.

2.2 What is Safety

Definition given by Websters dictionary of safety is as follows

”free from harm, injury, or risk; untouched or unthreatened by danger or injury; unharmed; unhurt; secure; whole “

This is the type of environment that the residents require for a safe neighborhood.

While safety is about the actual physical danger it also has a perceived aspect to it.

Words “Perception” and “cognition” are interlinked and confusing therefore confused as psychologist have defined the meaning properly.

Perception- process of being aware of the stimuli in our surrounds.

Cognition – categorizing the stimuli, distinguishing between them, and recognizing them. ²

Therefore, the sense of safety is something both perceived via a stimuli in the surroundings and this stimuli is categorized via cognition as a belonging to a safe structure.

David Canter talks of ways how this internal cognition process can be recognized via descriptive answers and mind maps.

Therefore, to arrive at an existence or nonexistence of safety in their housing schemes, mind maps, descriptive answers will be obtained from residents.

2.3 What is Physical environment

Oxford dictionary defines the environment as “the natural world in which people, animals and plants live” . Environment can include both tangible and intangible things. Tangible things such as furniture, bricks, trees, space etc and intangible things such as sound, light, shadows etc.

For this study, physical environment would mean tangible spaces and areas relating to housing both externally and internally.

Externally it would include areas such as streets, shops and other institutions close by, parks and playgrounds in and adjoining the development, vehicular parking lots, landscape of the site the development is located in, external corridors , overhead balconies, overhead walkways ,Gates and entry ways .

Internally it would mean the main entry way, other internal public entry ways, Lobby spaces, Elevators, staircases, Fire escape, Internal corridors, Roof top, balconies, windows and the door to the individual unit.

² David Canter, *The Psychology of Space* (The Architectural press LTD, London, 1977).

2.4 Existence of a relationship between crime and safety and physical environment.

From international research work that has been carried out in LIHRH, it has been found that inappropriate design of the physical environment and system of distribution of apartments have led to many of the problems associated with LIHRH.

Oscar Newman in his book “creating defensible space” proves with case studies from Classen point scheme; Ny, The five oaks; Ohio and public housing in Younkers;NY, how the changes made into the physical environment can reduced the crime rates. (Oscar Newman, 1996)

Below chart shows this relationship in terms of how the housing scheme is located in proximity to street, the lobby visibility and the crime rates.

<i>Surveillance (Building in Relation to Street)</i>				
<i>FMO's* in Lobby</i>	<i>All Projects</i>	<i>(a)</i>	<i>(b)</i>	<i>(c)</i>
		<i>Projects Where All Buildings Are Facing and within 50 feet of Street</i>	<i>Projects Where All Buildings Are Facing and within 50 feet of Street and Having Good Lobby Visibility</i>	<i>Projects Where Less Than 30% of the Buildings are Facing and within 50 feet of Street</i>
<i>Rate per 1000 Population</i>	7.5 (140 projects)	5.3 (22 projects)	4.4 (12 projects)	9.7 (21 projects)
<i>* Felonies, misdemeanors, and offenses.</i>				

Table 2.1 – Surveillance (Building in relation to Street)

(Oscar Newman, 1973, p. 84)

Subsequently many researchers have tested his theory and it has proven that there is a negative relationship ship between certain physical environmental attributes and crime rates. What these attributes will be discussed later.

Many changes to the physical environment were done both in America and in USA to keep out crime. Below example shows in Dublin changes done to the streets to discourage the loitering of unknown strangers in the streets.



Image 2.1 – Example of street in Dublin that has tried to control crime via environmental design.

(Inspector Niall Featherstone, 2017)

This study will attempt to see whether this is true in Sri Lankan context also and if so, what can be done to improve these conditions and to decrease crime in LIHRH. All these conditions are interrelated and changes in one will affect the others.

2.5 Defensible theory

Oscar Newman in “defensible space” and in “creating defensible space” argues that as the Height of a residential building increases crime rates go up and the physical environment and the social profile of the residents affects the crime rates of a housing scheme and the sense of safety.

In social profile of residents, he argues that

- a. more teenagers that are there in a housing block, more crime will occur.
- b. More FDA funded families are together more crimes will occur.

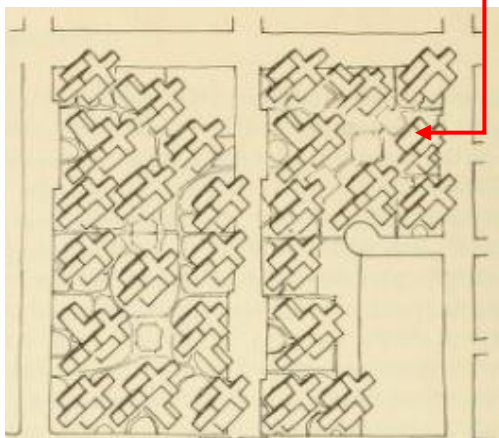
In Newman’s theory, more strangers have access to the housing units easier for crimes to be committed by them. Therefore, defensible theory is about eliminating strangers and increasing the residents right to defend their environment. In physical environment following attributes contribute to increase or decrease of crime rates

A. Territoriality – “The capacity of the physical environment to create perceived zone of Territorial influence” (Oscar Newman, 1973)

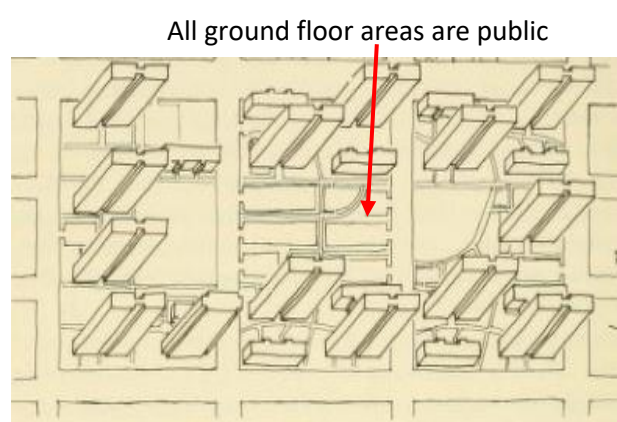
This is the perception the offenders have of a place as it belongs to somebody. This is increased by the amount of territory access the residents have of their surrounds. If the residents claim their surrounding public area as private space, then criminals do not have the freedom to easily come to that area since he would be answerable to people claiming this territory as his/her.

A1. Physical form of the building with the ground that allows territories to be defined and defended.

Physical form creates zones that residents can claim as theirs



Brownsville houses

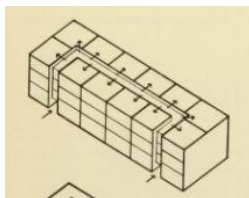


All ground floor areas are public

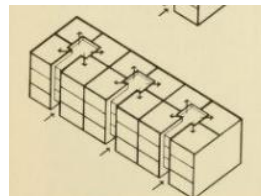
Van Dyke houses
(Oscar Newman, 1973)

Image 2.2 – facilitation of territoriality via the built form

A2. Lesser the number of units served by an entry way it is easier for residents to identify strangers in the entrance way and claim it as their entrance. Ideal number of housing units served by an entry way between 6-10 in mid risers.



Only 2 entry ways serve all 36 units- thereby at these entries residents will not know who a stranger is



3 entries serve 36 units – along with the cluster form an entry way servers only 12 houses and therefore easier for residents to identify strangers

Image 2.3 –Limiting strangers via entry way arrangement

A3. At ground level reduce public non claimed areas & increase territoriality of residents

A3.1 In front - give ground floor residents ownership to their immediate front to increase zones of influence

A3.2 In the Back of the block – eliminate public area by giving ground floor residents the ownership of the rear

A3.3 In common areas – Define and create zones for individual groups who will have claim over these. Ex. Children's play area, elder's sit out , etc.

A4. Street Design – throughfare across a housing scheme increases the possibility of offenders to hang around and escape easily. If they have to retreat from the same route that they came it is more likely for them to be caught and if perpetrators are aware of this they are more likely not to commit crime in such places. To achieve this following to be carried out

A4.1 Block off the number of main accessways

A4.2 create cul de sacs

A4.3 Reduce street size and Personalize streets to increase territoriality with parking bays and furniture.

A4.4 Use real and symbolic barriers to increase this

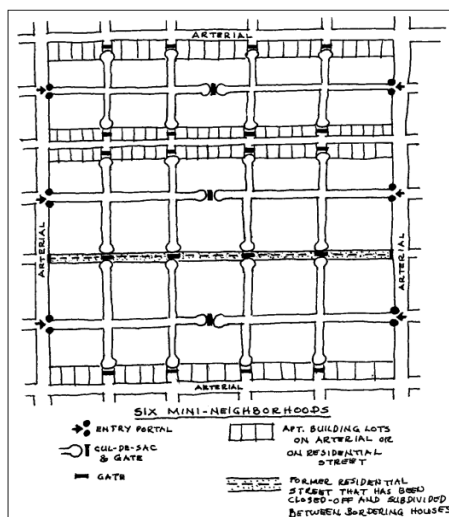


Image 2.4- Schematic showing ideal way to access mini neighborhoods

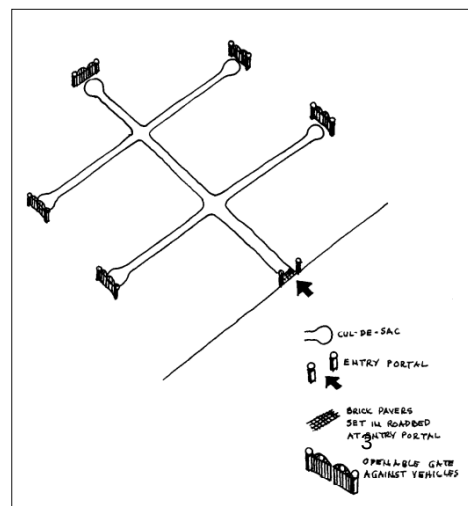


Image 2.5- Cross plan for an Ideal mini- neighborhood

(Oscar Newman,1990.)

³ (Oscar Newman, 1996)1996.

A5. A gradation of hierarchy of spaces which enables people to understand territoriality.

He also advocates slight elevation in the ground floor plane to increase the identification of private space.

B. Natural Surveillance – “Capacity of Physical design to provide surveillance opportunities for residents and their agents “ (Oscar Newman, 1973)

Newman argues that if perpetrators are more likely to be seen from others, then they do not attempt crime in those locations.

B1. External spaces – the amount of visibility of road and surroundings from houses

B1.1 Entrance distance from the road to be within 50'-0”

B1.2 Maximum length facing the road

B1.3 Good Lobby visibility from the road

B1.4 No hidden corners in the access route individual unit

B2. Internal spaces – How well the internal public spaces can be seen by other residents to provide assistance, incase of an emergency

B2.1 – Location of lobby and elevators without hidden corners and good visibility

B2.2 – Good Visibility of access corridors

B2.3 - Good visibility of the fire escape stairs and other areas

C. Image – “The capacity of design to influence the perception of a project’s Uniqueness, Isolation and Stigma” (Oscar Newman, 1973)

C1. – Image resulting from project size, location and shape and uniqueness

C2- Image resulting from quality of materials, finishes and maintenance, good lighting.

D. Milieu - proximity to other safe institutions and areas such as police stations, busy commercial area

E. Juxtaposition of residential areas with other” safe” functional facilities

E1. Entrance through a busy “safe” street

E2. Cross sectional plan Size of the adjoin safe area to be complete visible from end to end.

Oscar Newman also stresses the importance of police surveillance, community involvement from the beginning for this to be successful.

2.6 Other theories views on crime and safety

While Newman favors homogeneity in ethnicity, religion and economic level in the residents for their ability to come to agreement is easier due to shared interest, Jane Jacobs in her book “ Death and Life of Great American cities” prefers a mix resident profile. Her reasoning is diversified resident profile has many different people that can help each other and that it will also help in reducing stigma attached to LIHRH.

While Newman discourages strangers on the sidewalks and proposes to limit teenagers in a development, Jane Jacobs says for a live street life that is safe a flow of strangers are necessary to keep the shops(agents of natural surveillance) active and children on sidewalks is a necessity for safe street, so parents will keep eyes on them and thus street will become safe. In her book she proposes following to make a city safe

1. There should not be many closed off buildings/spaces because that increase the dilapidated state in an area and attract crime to such unseen vicinity.
2. Active streets in front of the blocks make residences safer.
3. Sidewalk should have children and elderly.
4. Sidewalks should have a diverse community and strangers.
5. Natural surveillance of the street should be possible from the upper levels of housing blocks with wide windows and balconies opening to the street.
6. There should be a mixture of Shops and institutes etc. in a neighborhood that would be constantly active 24/7 and with user groups during different times of the day.

7. Vehicular traffic is important as it provides a constant “eyes on the street” (Jane Jacobs, 1961)

Whereas Newman opposes vehicle passages as easy escape routes Jacobs encourages them as elements of “eyes on the street” and possible facilitators for commercial activity. Jacobs also proposes that there should be a clear demarcation between what is private space and public space for crime not to occur. Where this line is not clear it is most likely for crimes to occur.

Barry Poyner in his book “Design against crime- beyond defensible space” points out the need for wider sidewalks to prevent people from pressing against each other which would make it easier for pickpocketing and the need for appropriate surveillance cameras. He also proposes that nighttime activities such as bars and cinemas should be strategically located without being too far from the bus and other transport facilities to avoid drunken brawls and attacks on the way home. ⁴

In 1986 Alice Coleman in “Utopia on trial” examines 4099 residential blocks with observations of 6 criteria (Litter, Graffiti, Vandalism, Children in care, Urine, Faces) to indicate the frequency of offences along with records from authorities and interviews from 224 people. She comes up with 15 physical factors that would have an effect on crime and safety. Most of them are repetitive as in Newman’s theory. These 15 are as follows -Dwellings per block, Dwellings per entrance, Stories per dwelling, stories per block, Overhead walkway, Interconnecting exists, Vertical routes, Corridor type, Entrance position, Entrance type, Blocks raised above stilts, Blocks raised above garages, blocks in site, Access points and play areas.(Alice Coleman, 1986)

New findings in this study is that Overhead walkways, obstructions to the entrance and Blocks raised above stilts increase the crime rate.

C. Ray Jefferey in his book Crime prevention through environmental design talks about the psychology, physiology and biosociology of criminals. He was the first to coin the word CPTED (Crime prevention through environmental design).

⁴ Poyner, B, *Design Against Crime; Beyond Defensible Space* (University press, Cambridge, 1983).

He proposes 4 ways that the crime Can be reduced.

1. Physical security that involves doors and windows. This can be viewed as a hardware approach to design.
2. Physical security at a more sophisticated urban utilization level.
3. Social and educational programs aimed at the potential victim.
4. Physical- socio planning with emphasis on science and research. ⁵

CPTED that were later developed have these three main components in them.

- a. Natural surveillance
- b. Natural access control
- c. Natural territorial reinforcement

Broken window theory by James Q. Wilson and George L. Kelling (1982) proposes that if there is a dilapidated empty property with a broken window , that the surroundings will generally degenerate and crime is more likely to happen in such places.

Summery:

In international research work it has been proven that built form and the environment has a direct link with crime occurrences and safety. Therefore, many theories of how crime incidents can be reduced has been written about and among them defensible theory by Oscar Newman is the most popular and adopted one in many countries.

⁵ C. Ray Jeffery, *Crime Prevention through Environmental Design* (USA: Sage publications Inc., 1977).

CHAPTER 03 – THEORETICAL FRAMEWORK ON CRIME AND SAFETY

3.1 appropriateness of the existing theories

Many theories on crime and prevention of it exists as shown in the previous chapter. These approaches waiver between creating gated communities and opening the community to outsiders, vehicles, people and attracting commercial activities to liven up the street.

Sri Lanka is made up of multiethnic and multi religious community. We have experienced communal violence based on discrimination against race and religion. In this context when a majority of one community is in one location it is easier for them to be subjected to discrimination and they also do not learn to get along with other communities which in the larger context finally will threaten the safety of the society and country. At the same time if these existing ethnic communities are broken in resettlement in the hope of reducing crime by providing a more diverse ethnic profile their social bonds will be broken. This would impact negatively in reinforcing their territoriality in defending their environment. Another negative factor of reinforced territoriality is the possibility of development of gang mentality which can be seen in USA. Though this is not widespread in Sri Lankan low-income communities, there is the potential for this to occur when taking into consideration the existing social structures.

Sri Lankan government in the recent past has been crowding LIHRH in singular locations and plans to increase more blocks in some of these which would lead to these areas being stigmatized and gang development.

Therefore, when deciding which theoretical framework to be considered, repercussions in the larger national context also will be considered.

It was also found in many studies that there is a positive relationship with the number of children and the crime rates. In housing distribution in Sri Lanka this at present is not considered. Since this is about changes in the physical environment it will not be considered.

It was also proven that as the Height of the building increases, (Oscar Newman, 1973) crime rates increase. Since this study is about high – rise developments, these criteria also will not be used.

3.2 Derived theoretical framework for testing crime and safety

Taking into consideration local appropriateness of the above discussed theories following have been selected a measurement criterion to determine the relationship between crime and safety and the LIHRH.

This will be handled under four main categories these are Territoriality, Natural surveillance, Image and Proximity to other safe places. What each of these are have been described in the previous chapter. These can be further categorized as internal and external. The effectiveness of these four main categories can be checked by sub factors in them. These are listed below.

1. territoriality

Externally -

- 1.1. Physical form of the building with the ground that allows territories to be defined and defended.
- 1.2. At ground level reduce public non claimed areas & increase territoriality of residents

a. Street b. front c. rear

- 1.3. Number of units served by entrance
- 1.4. Demarcation public and private space by elements

Internally -

- 1.5. Access to roof top
- 1.6. Upper walkways
- 1.7. Sidewalks adequate width
- 1.8. Adequate size of elevators and corridors
- 1.9. Hardware security

2. Natural Surveillance

Externally -

- 2. 1. Entrance distance from the road to be within 50'-0"
- 2.2. Maximum length facing the road
- 2.3 Balconies or overhead corridors overlooking the surrounding and road
- 2.4 Windows overlooking the street and surrounding area
- 2.5. Good Lobby visibility from the road
- 2.6. No hidden corners in the access route individual unit
- 2.7. parking
- 2.8. Playground location, size, visibility cross width

Internally –

- 2.9. Location of lobby and elevators without hidden corners and good visibility
- 2.10. Good Visibility of access corridors
- 2.11. Good visibility of the fire escape stairs and other areas
- 2.12. Hidden corners en route to the front door

Both internally and externally

- 2.13. Good lighting – external and internal
- 2.14 . Coverage of areas via surveillance camaras

3. Image

- 3.1. Image resulting from project size, location and shape and uniqueness
- 3.2. Image resulting from quality of materials, finishes and maintenance, good lighting.
- 3.3. Existence of empty spaces
- 3.4. quality of Landscaping

4. Proximity to other safe places

- 4.1. Police stations and other safe residences and institutions or negative institutions
- 4.2. Busy shops and commercial establishments

**Theoretical framework for deciding how inductive the physical environment of
LIHRH
for crime and safety**

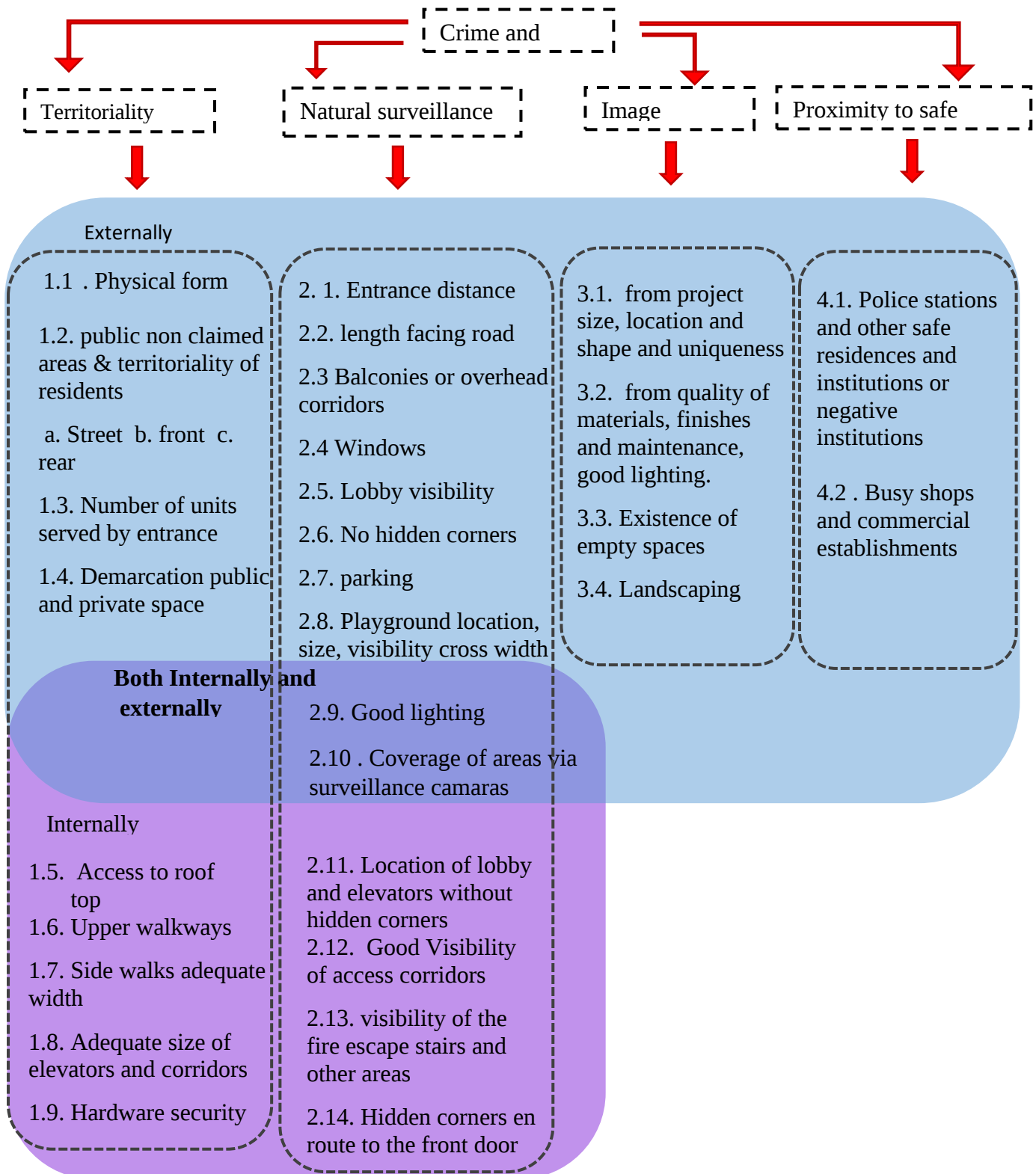


Image 3.1- Theoretical frame structure

Summery:

From many international theories available in 3.2 an appropriate theoretical frame work for Sri Lanka is developed to measure the crime and safety in Sri Lankan LIHRH.

These come under four main categories – territoriality, Natural Surveillance, Image and Proximity to safe and non-safe places.

CHAPTER 04 – CASE STUDIES

4.1 Identification of case studies

Three case studies have been identified in the northeast of Colombo where the most density of LIHRH is, as mentioned earlier. UDA has constructed LIHRH in three time periods. These are Phase 1,2 and 3. At present phase 3 LIHRH is under construction and have not been given to the people. Therefore it is possible to get projects from only phase 1 and 2.

4.1a Case study 1- Muwaduru Uyana

Muwaduru Uyana is located in Madampitiya , Thotalaga. This was selected due it belonging to the Phase 2 and its physical form of containing both smaller number of units per block and larger number of units per block. Another reason is access road is popular road used by many people.

Built in 2014 and at present has 872 units of which 2 units are occupied by UDA and as a police house. Though there was a police unit earlier at site, it no longer functions after an attack on it by residents.

Access is via the Ferguson Road and in close proximity to the Kelaniya bridge.

Most of the residents are from the “219 watta” and few from the “Kammall watta”. At present 50-unit owners have moved out after renting out their premises.

Physical form- Made of 4 blocks and of 11 stories. 2 smaller with 10 units per block and 2 big with 26 units per block. 2 smaller blocks are linked at third, sixth and the ninth levels via bridges. There is no fence or boundary surrounding the premises, Total number of lifts surveying 870 units are 6 nos. and at the time of the survey 2 lifts were not functioning. Units are arranged in 2 stack system along 2 main access ways.

Adjoin these main access corridors, small lightwells/courtyards are located to provide legal lighting for the units. South boundary consists of Sanken construction site while north has an unidentified, non-landscape area that has become a garbage dump now. Beyond this north boundary lies unauthorized settlements, whose garbage is also dumped into unidentified area.

Garbage is collected by the municipality once a week. But in addition to this, every other day garbage is collected by a group of residents (mostly drug addicts) for a nominal fee. They sometimes do not take these garbage bags to the dumping area but drop it down the court yards/light wells.

Ethnic profile: Sinhala, Muslim and Tamil communities are each in 1/3 ratios.

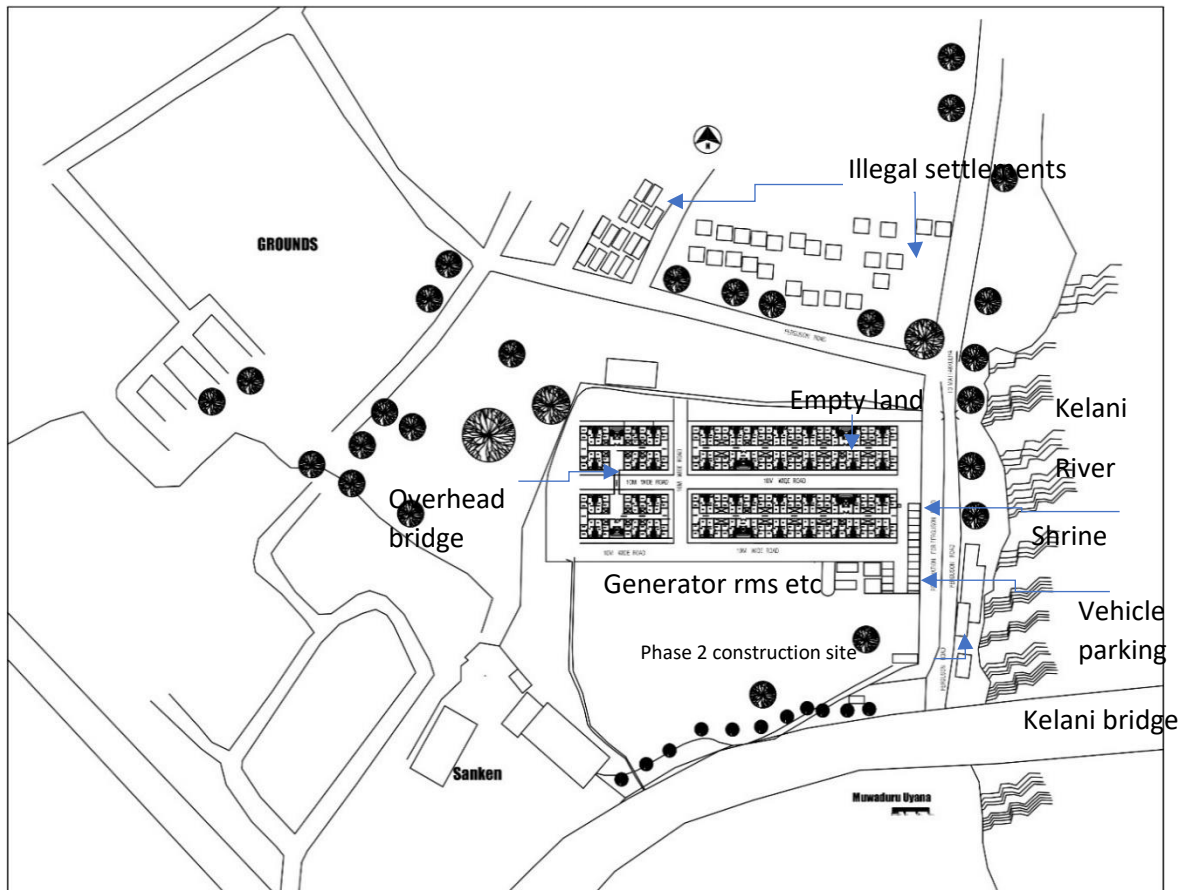


Image 4.1- Contextual plan of Muwaduru Uyana



Image 4.2- View of Muwaduru Housing scheme from the bridge

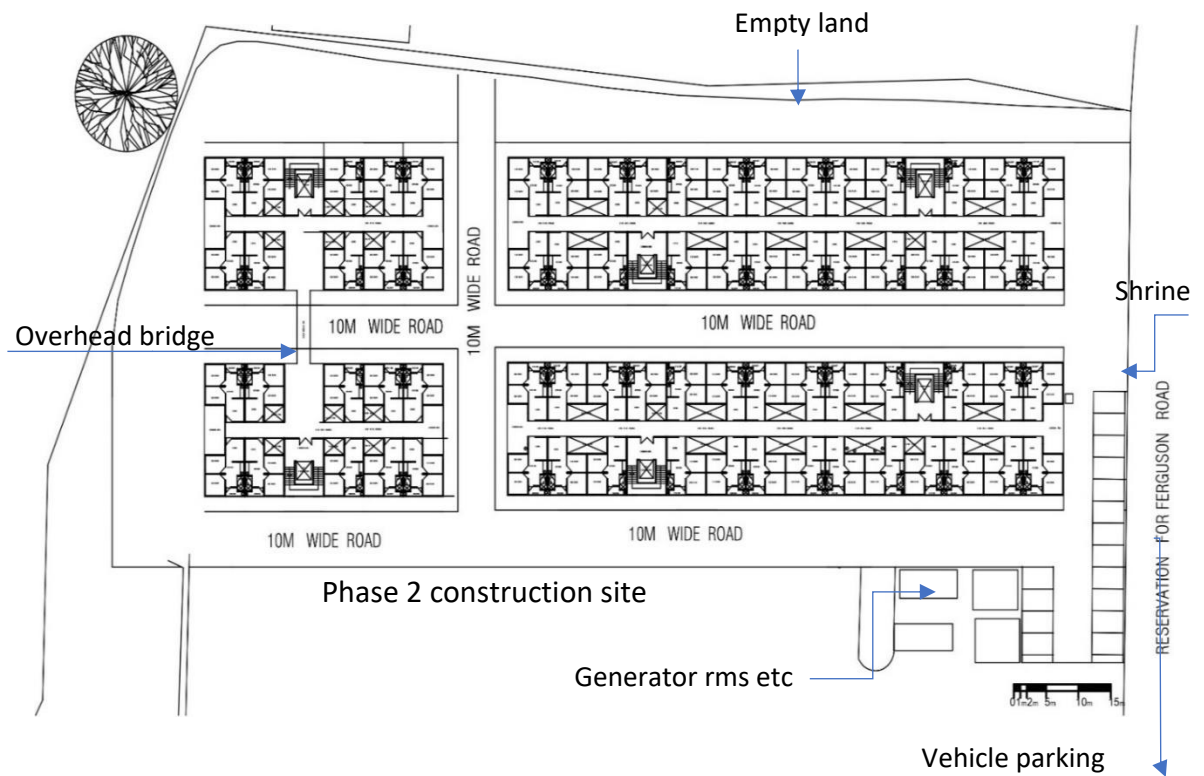


Image 4.3 -Ground floor plan of Muwaduru Uyana

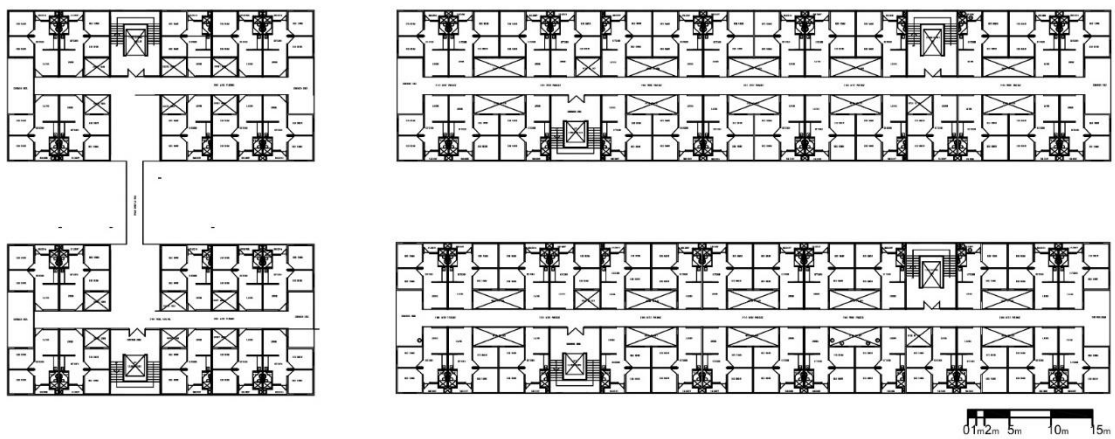


Image 4.4- Typical floor plan of Muwaduru

4.1b Case study 2- Sirimuthu Uyana

Srimuthi Uyana is in Grandpass next to the new harbor road which under construction.

This LIHRH was selected due to the smaller number of units per block and for having bigger balconies that opens to the surrounding roads. Other reasons for selection was one of it's boundary is an edge defined by the new harbor road and the main access road to the site is a cul de sac road. This LIHRH belongs to phase 2.

Physical form – Consists of 4 blocks of different shapes and each block consists of 11 floors. Arrangement is 2 stack and is in configurations of 12, 10,10 and 8 per floor in ground level per block. Total number of units are 546 nos. Of which 2 are given for UDA and police post, 1 nos for a preschool in ground floor, 1 no. for community hall and 2 nos. as police houses in the 11th floor.

Main community is from the “Grandpas watta”, 10 units were given to Minister Ravi karunayake's supporters and other 15 nos. to various communities that required housing. 250 units have been rented out by their original landowners.

Ethnic profile as per survey carried out during covid times, is as follows –

Muslim - 245 units

Tamil – 119 units

Sinhala - 175 units

There is a row of shops within the scheme but except for 2 shops others are generally closed and used as stores. There is a small Buddhist shrine with a bo tree at the premises and a new three storied mosque is been built at the entrance under minister Badurjeen .



Image 4.5-
Road view of
Sirimuthu Uyana

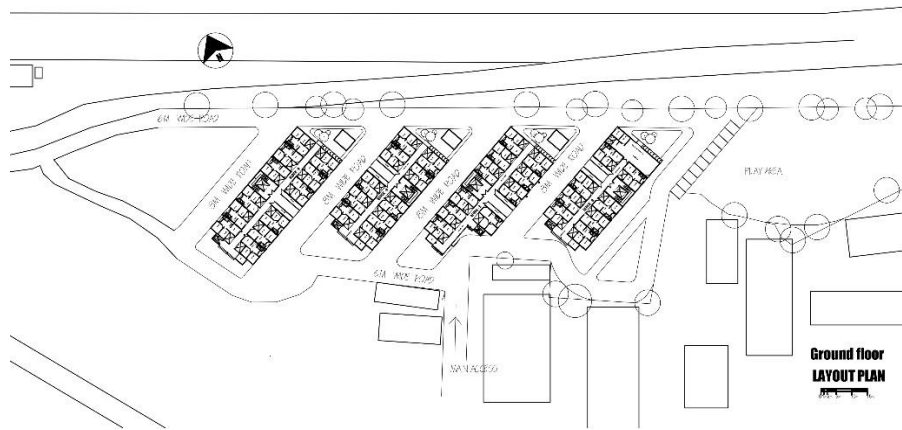


Image 4.6-
Contextual plan
of Sirimuthu
Uyana

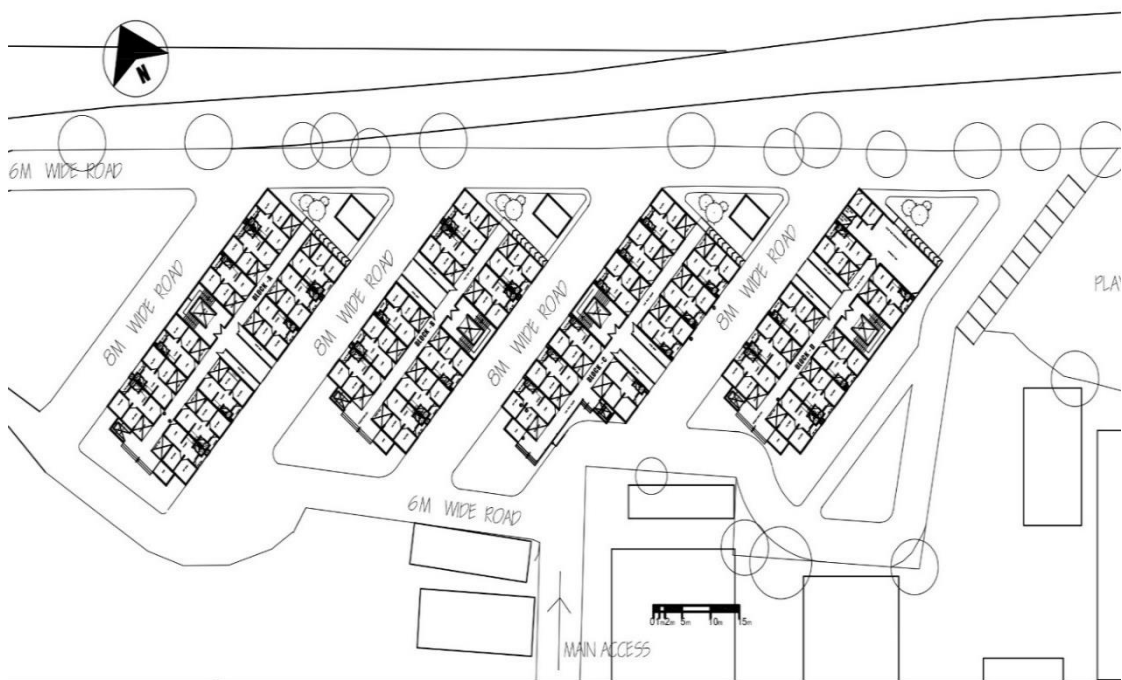


Image 4.7- Ground floor plan Sirimuth Uyana

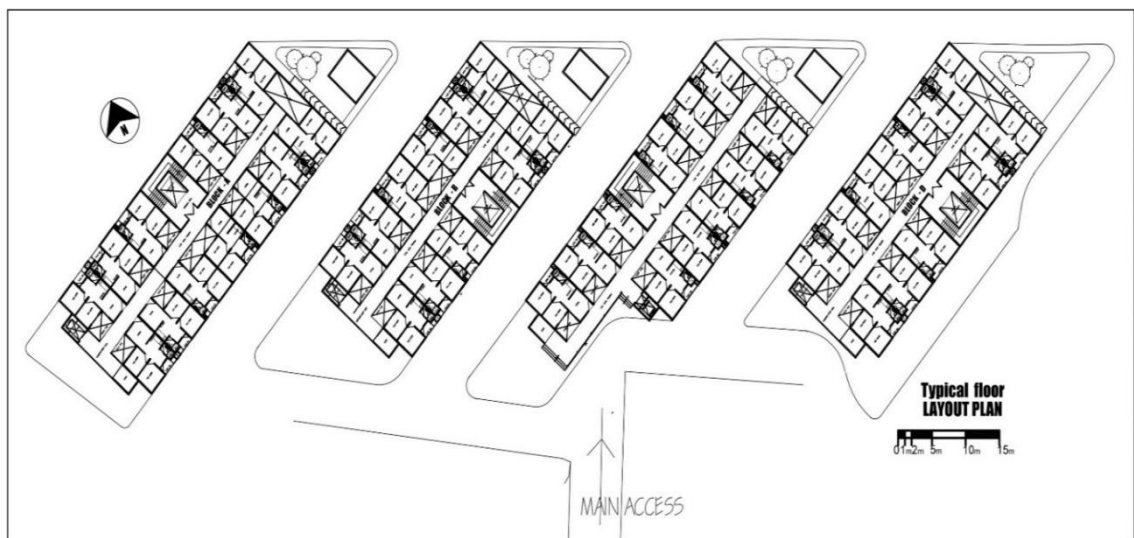


Image 4.8- Typical floor plan of Sirimuthu Uyana

4.1c Case study 3- Randiya Uyana, Heenamulla

This LIHRH belongs to the first phase of UDA driven urban housing settlements. This is located in the Heenamulla. At the time of survey Heena Mulla has 6,053 units in 6 housing schemes.

These are as follows – Methsada sevena – 941 units, Leelamuth - 1080 units, Mihijaya pura - 1647 units, Ranmuthu - 576 units, Sathhiru Sevana - 672 units and Randiya Uyana - 1137 units

This LHIRH was chosen for it been part of a large development and also for the physical formation of it of 1 stack units with central courtyards. There is no police station at present in the development. A common police station for all the Heenamulla houses were established in Mihijaya pura housing scheme.

Of the 1137 units available 2 units are taken by the UDA office and One unit for the police post which is closed now. In Randiya Uyana there are five blocks with a total population 5063 as per the survey done on September 2021.

Popultion has come from 318 watta, Bluemandel, Cyril C. Perera Mawatha, Furgeson road, Madampitiya road and Nagalan street.

Ethnic profile is Sinhala - 1470

Muslim – 1843

Tamil - 1750

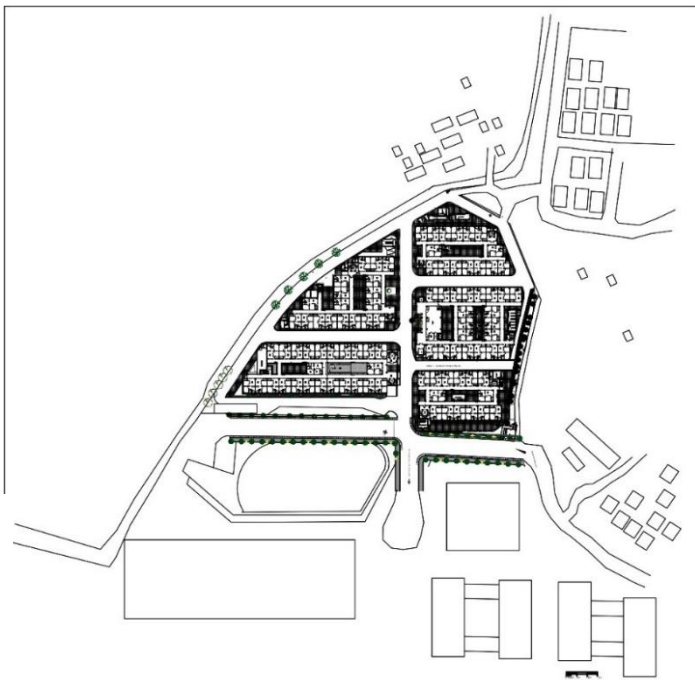


Image 4.9-
Contextual plan of
Randiya Uyana



Image 4.10 – View of Randiya Uyana from the playground



Image 4.11- Ground floor plan of Randiya Uyana

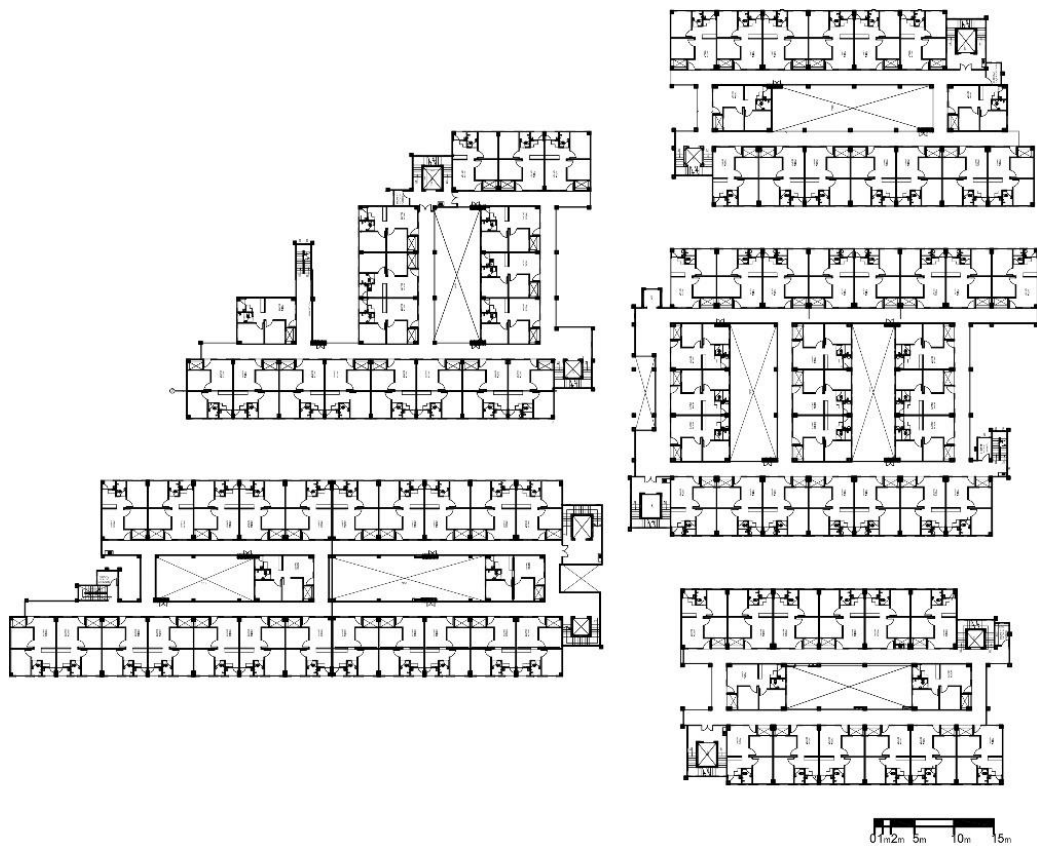


Image 4.12- Typical floor plan of Randiya Uyana

4.2 Surveys carried out

30 residents from each housing scheme were selected for their house location in the housing scheme and were given a questionnaire. It is attached herewith in the List of Appendices. Most residents answered the Sinhala translation of the English questionnaire attached as Appendix 01. Total number of participants were 90 numbers.

30 people X 3 schemes = 90 residents

Questions were based on territoriality, natural surveillance, the image they have of the housing scheme and their feedback on the amount of crime occurrences in the scheme and how much they feel that this is a safe environment.

Furthermore, project managers from UDA site office of each housing scheme was also interviewed.

In addition to this they were also given 2 maps containing the contextual map and the typical floor plan of each housing scheme as shown above in the explanation of the case studies. Then they were asked to draw a line surrounding

- a. Area that you feel safe
- b. Area that you consider to be unsafe

Photographic of survey of both external and internal contributing factors was also carried out .

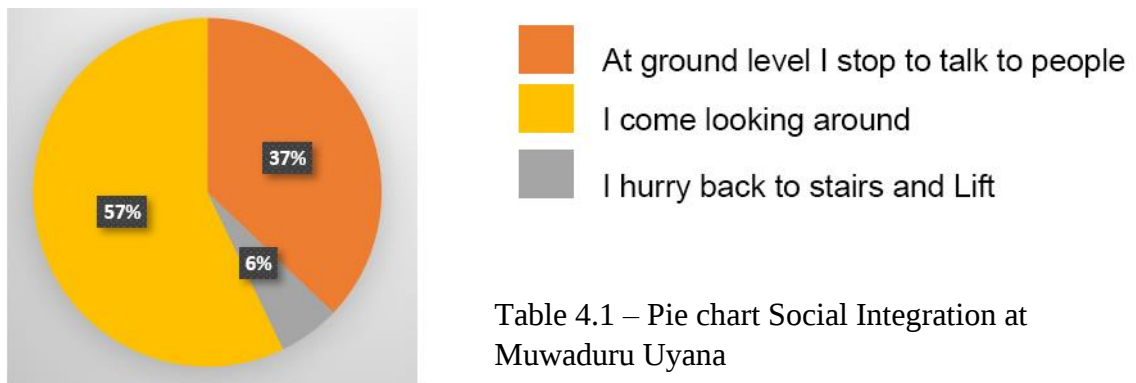
4.3 Case study 1- Muwaduru Uyana

4.3 a – Finding from the questionnaire survey

To determine the amount of safety that the residents felt in LIHRH of Muwaduru Uyana several questions were asked via survey.

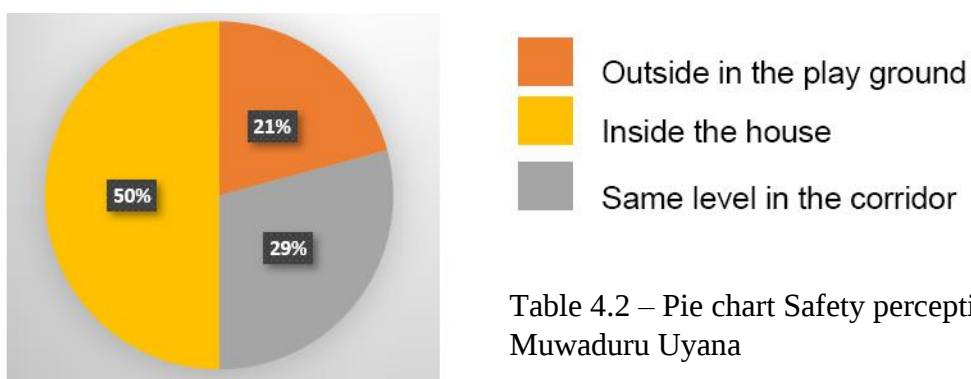
When asked about their routine of entering from the street to their house, 10 people said they stop to talk to strangers, 19 people said they hurry from street to the lift and only 1 people said they come looking around out of a sampling of 30 people.

When coming from Road to House



When asked about where they allowed their children to play 12 people said only inside the house and 7 in the corridor of the same level floor. Only 5 residents allowed children to go to the ground or other levels to play.

Where do you let your children play?



When asked about whether and where they allowed children to go to shops majority of 15 people said that they do not allow children to go to the shop while 4 people allowed children to go to shops in the same floor. Only 8 people allowed children to go to shops in other levels of this majority of the people were from block C and D. only 2 people from blocks A and B allowed children to go to shops in other levels. This indicates a sense of insecurity in block A and B in the public spaces.

Do you allow your child to go to shops alone?

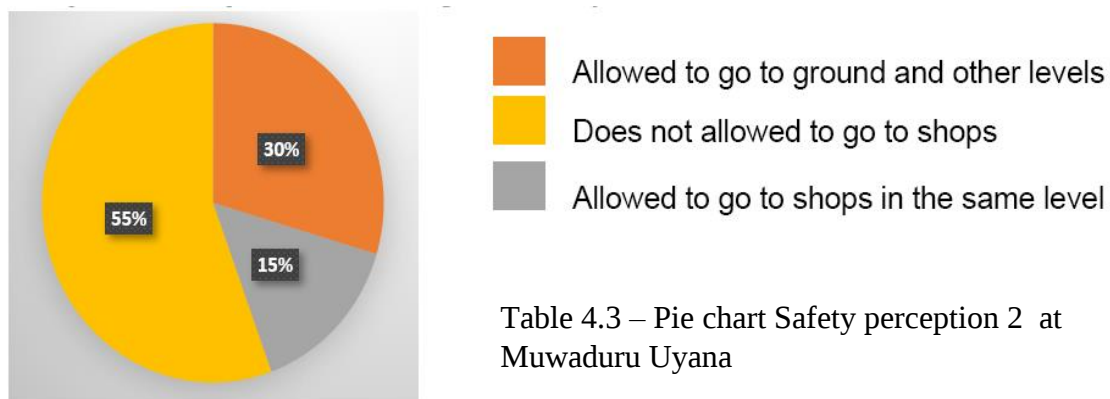


Table 4.3 – Pie chart Safety perception 2 at Muwaduru Uyana

To determine how residents felt about the criminal activities in Muwaduru Uyana several questions were asked. The following graphs shows what they thought. This shows that robberies have happened to a number of people while the answer to drug dealing shows an inconsistency. Sexual harassment and murder are rare occurrences.

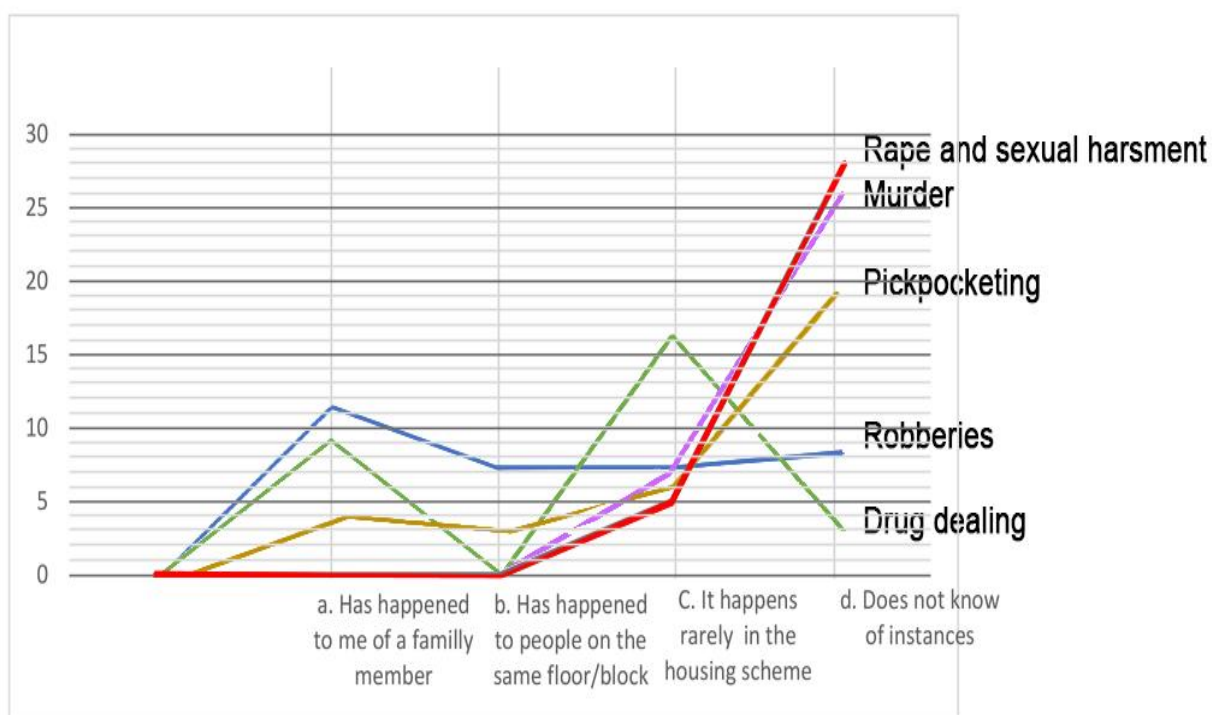


Table 4.4 – Graph of Perception of Crime by residents at Muwaduru Uyana

From residents of Muwaduru Uyana, how they felt about the adequacy sunlight, lighting at night and adequacy of lift facilities was asked. Since good lighting conditions create safer environments for residents due to good visibility and if adequate lifts are there crowding in lifts and lift lobbies does not happen which prevents pickpocketing. Inadequate lifts also indicate a large number of people present for a use of one lift, possibility for criminals to merge with the crowds and enter the building without been identified by the residents is high in such instances. Exits for them also is easier without been identified as a stranger.

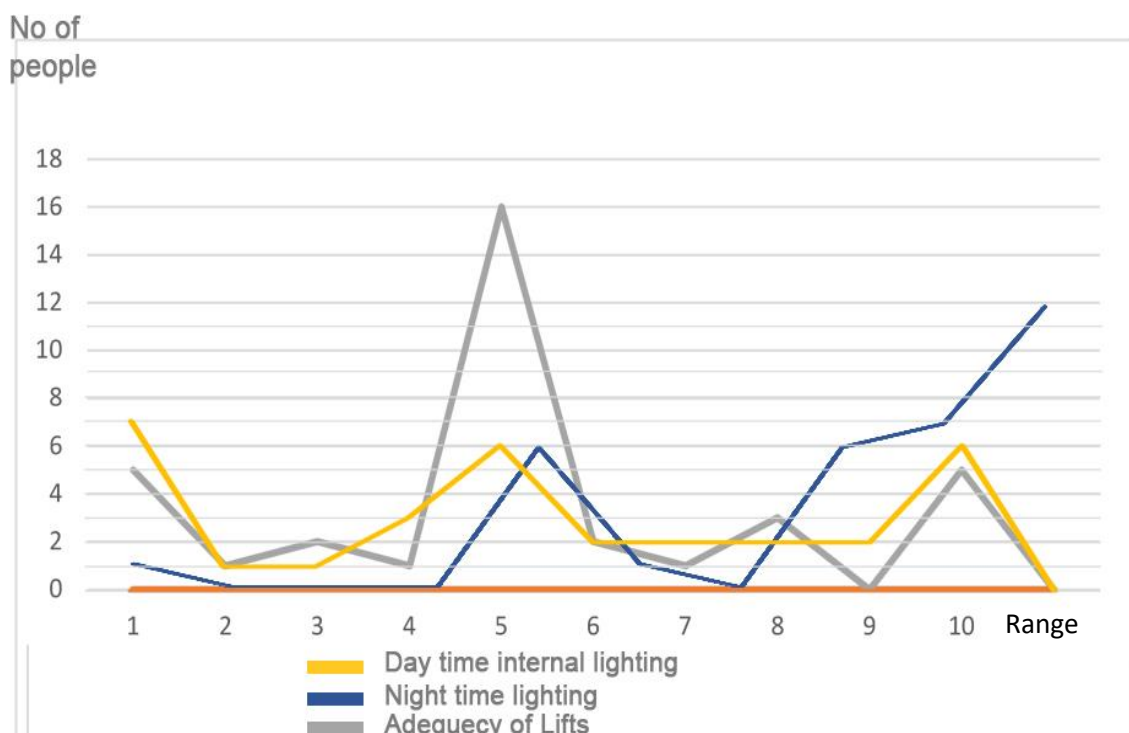


Table 4.5 – Graph of perception adequacy lighting and Lifts at Muwaduru Uyana

In this 1 is very bad, 5 is adequate and 10 is very good.

Summery sheets of these are attached in annexure 2.

Bellow are the Results of the survey carried regarding territoriality, Natural surveillance and Image.

Survey results - Muwaduru Uyana Block no		Ground fl		First fl				Third floor				5th floor				6 fl		7th floor		8th fl		9th		10th floor		11th floor				Total	%		
		A	B	C	C	C	D	B	B	C	C	D	B	A	B	B	A	C	C	D	C	D	D	C	C	C	B	C	D	D			
Territoriality																																	
1	Do you sweep outside your door and the immediate corridor area no 0 yes 1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29	96.67		
2	Do you sit outside in the corridor or in the balconies? no 0 yes 1	1	0	0	0	1	0	0	1	1	1	1	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1	20	66.67	
3	Do you keep things outside your house in the corridor or in the grounds no 0 yes 1 some times 1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	0	1	1	0	0	10	33.33	
4	Are you your family members of any social group in the development? no 0 yes 1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	6	20	
Natural Surveillance																																	
1	How many neighbour's do you know by name a. I know 2 families by name in my floor b. I know 5- 10 families by name in the floor c. I know half of the families by name in my floor d. I know all of the people by name in the fl e. I know 5-10 families by name in the block f. I know all the residents of my block by name g. I don't know nyone by name	1																													6 6 4 9 1 5		
2	Do you keep your front door slightly open at times to speak to neighbors or for some a family member to come in? no 0 yes 1	0	1	0	0	1	1	0	0	1	0	1	0	1	1	0	1	1	1	0	1	1	0	0	1	1	0	1	0	1	1	17	56.67
3	Do you leave your door key or something to be given to some one in a shop in any of the floors or ground level? no 0 yes 1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3	10.00	
4	Do you leave your door key or something to be given to some one in a shop in the same floor ? no 0 yes 1	1	0	1	1	0	0	1	0	1	0	1	1	0	1	1	0	0	1	0	1	0	1	1	1	0	0	1	0	0	1	16	53.33
5	Do you or your family members go to ground floor outside, at any time of the day to spend time or for leisure activities ? no 0 yes 1	1	0	1	0	0		0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	13.33	
6	Do you have some one that stays throught out the day at home ? no 0 yes 1	1	0	1	1	1	0	0	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	23	76.67
Image																																	
1	Do you know of empty houses or unused spaces in your floor ? no 0 yes 1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	5	16.67	
2	Do you know of empty houses or unused spaces in the block or t no 0 yes 1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	6	20.00	
3	Have you or your family posted photos of your block and outside the block in the social media? no 0 yes 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	4	13.33	
4	Do you see garbage and litter around the place ? Rate 1 - 10 1 to 2 3 to 4 5 8 10																														12 3 6 2 7		
		1																															

Table 4.6 – Summery sheet of Survey results; perception of Safety at Muwaduru Uyana

Territoriality

In this though 96% said yes to sweeping outside their homes and corridors, no one in block A and B swept along the corridors, only Infront of their own door. But in block C and D upper levels people swept the corridors as well. Though 33% people said yes to keeping things outside their homes, in the chart it can be seen no one from any of the blocks kept things in the corridors of the ground floor. Also from third floor 5th floor no one kept things in the corridors. The two people that said yes to keeping things in the first floor and third floor are also from Blocks C and D.

No one from 3rd to the 7th floor were part of any social or sports group in the housing scheme. This shows a non-involvement in the affairs of the housing scheme and a lack of feeling this as their territorial grounds.

Of the 66% that answered “yes” to whether they sit outside in the corridors and balconies, most of them sat in their house’s rear balconies. It can be also noted that in the ground and first floors number of people that sit outside is less and is better in the upper floors.

Therefore this survey indicates that Territoriality in the Long blocks of A and B are very weak from ground to the 5th floor.

Natural surveillance

More than half of the residents (56%) have said they would leave the door half open for someone to come in. While half of them (53%) would leave the key with some in their own floor. Only 10% said they would leave the key with someone in another floor. Only 13% would go to the ground level for reasons other than work. This indicates a lack of surveillance on the ground floor.

Only very few residents knew families in other floors. Even less than 1/3 rd of the people knew all the people in the same floor. This indicates that natural surveillance does not occur even in their own floor, since people are do not know who the inhabitants are.

Image

Empty non used places are relatively less (20%). Only 13% posted things on fb with their housing block as background which shows that they are not proud of the image of their living environment, therefore the image is poor.

21 people marked 5 or less than 5 regarding the cleanliness of the housing scheme. This is 70%, which indicates a bad environment due to the litter in the scheme.

Therefor the survey indicates that the image is low in Muwaduru Uyana.

4.3 B – PHOTOGRAPHIC SURVEY

Territoriality

- i. There was hardly any evidence of territoriality in the ground level and on the long blocks of A and B. Ground level corridors of blocks A and B are ill ventilated and full of people and there were no instances of residents privatizing them.

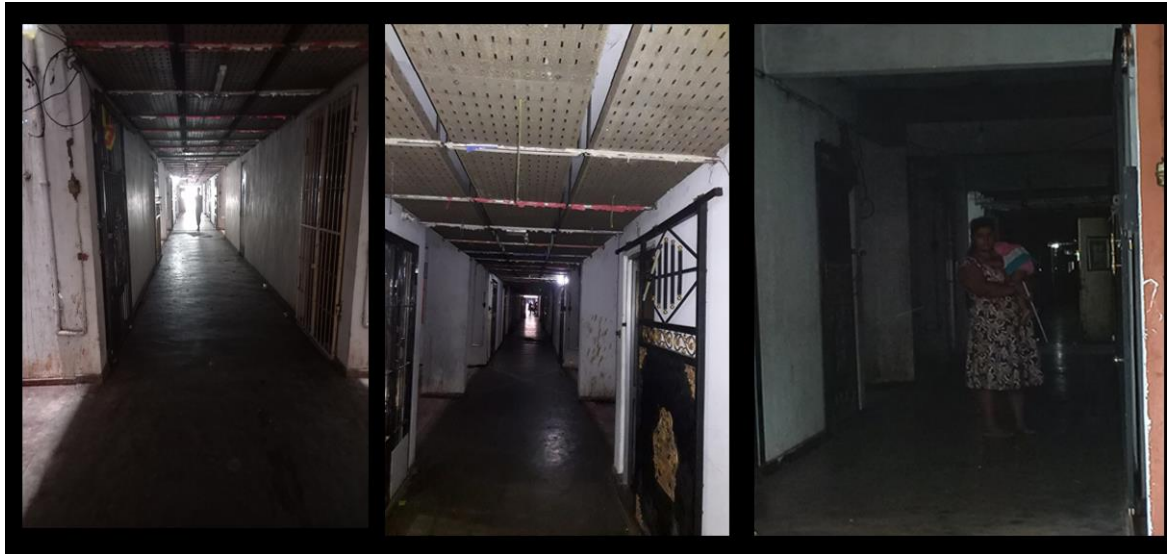


Image 4.13 – Inner Corridors of Block A and B in Muwaduru Uyana

- ii. While there were cloth racks on Blocks C and D corridors, they were chained padlocked to non-moveable property. In some floors of block C and D there were water bottles kept near the entrance doors to deter animals from urinating.

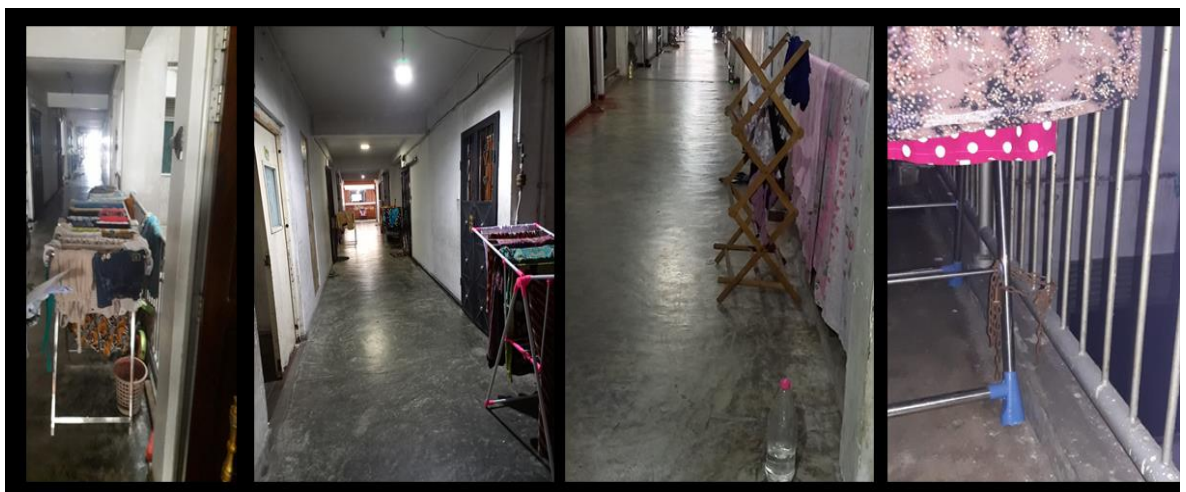


Image 4.14 – cloths racks in inner corridors of Muwaduru Uyana

- iii. Ground floor outside was also treated as no man's land with litter thrown into it. Roads went through out every were. From the surrounding roads there were no fence or obstruction that limited from people from freely approaching



Image 4.15 – Public external areas in Muwaduru Uyana

Natural surveillance

- iv. All of the doors on the long blocks of A and B were closed in all floors. No corridor activity was observed. Only in the upper corridors of short blocks C and D corridor activities were detected. But very rare.



Image 4.16 – Children playing in the inner corridors of block C and D in Muwaduru Uyana

- v. Balconies were not large and did not provide enough space for someone to stand and attend to work and there by provide natural surveillance. Windows were also mostly kept closed.



Image 4.17 – Exterior facade view of Muwaduru Uyana

Image

- i. Place was littered with garbage both internally and externally. Mostly Blocks A and



Image 4.18 – Garbage littered in Muwaduru Uyana

- ii. The upper floors of Blocks C and D displayed a greater degree of cleanliness.



Image 4.19 – Upper level Inner Corridors of Block C and D in Muwaduru Uyana

- iii. At the entrances where the shops are there are people but there are also gangsters that hangout at the ground floor entrances. Before taking this picture 2 gangsters were seated here and then they moved out.



Image 4.20 – Internal Entrance Lobby of Block A in Muwaduru Uyana

4.3 c – Via interviews and observation

Most of the residents said that they do not go outside of their houses. Residents who said they would go outside and talk to people along the way were the older people above 55 years that have come from the original watta. They seem to have confidence about safety whereas the younger people indicated they lived here because they have no other option.

It was observed that at the time of visiting 2 Lifts were broken. As said by the UDA site manager and some residents, these lifts are purposefully broken by gangs to isolate the lift area. When the lifts are broken people do not go into these lobbies. Then lobbies are used for drug dealing and the staircase behind the lift is used for drug consumption and hanging out by gangs. Though in the survey we did not ask about the gang fights, by interviews it was found that there are many gang fights that occurs within different groups in the housing scheme. There is money exertion for drugs that happens in the ground level. Therefore, residents are reluctant to send children for any ground floor activity.

Many residents also complained about domestic violence. After 11 am and the thin walls and middle courtyards carry the sound at night. These contribute to a sense of lack of safety.

UDA official complained that they have 3 full time cleaners to sweep the scheme, that by the time they sweep from one end to the other, garbage is back again in places. This was also mentioned by many residents.

Residents also complained about water leaks, sewer pipe leaks that have led to various cracks in the building, mold etc creating bad internal housing environment. They also complained that these are no one to attended to these though these were shown to officials many times. This allowance to deteriorate the place, makes residents want to look for better places to live and leave the LIHRH which promotes non-permanent users who do not provide territoriality and natural surveillance. (Jane Jacobs, 1961)(Oscar Newman, 1973)

4.3 d Mind Maps

Residents were asked to draw circle around where they felt or considered an unsafe area in their neighborhood. Below image show the summery of these results.

Muwaduru Uyana

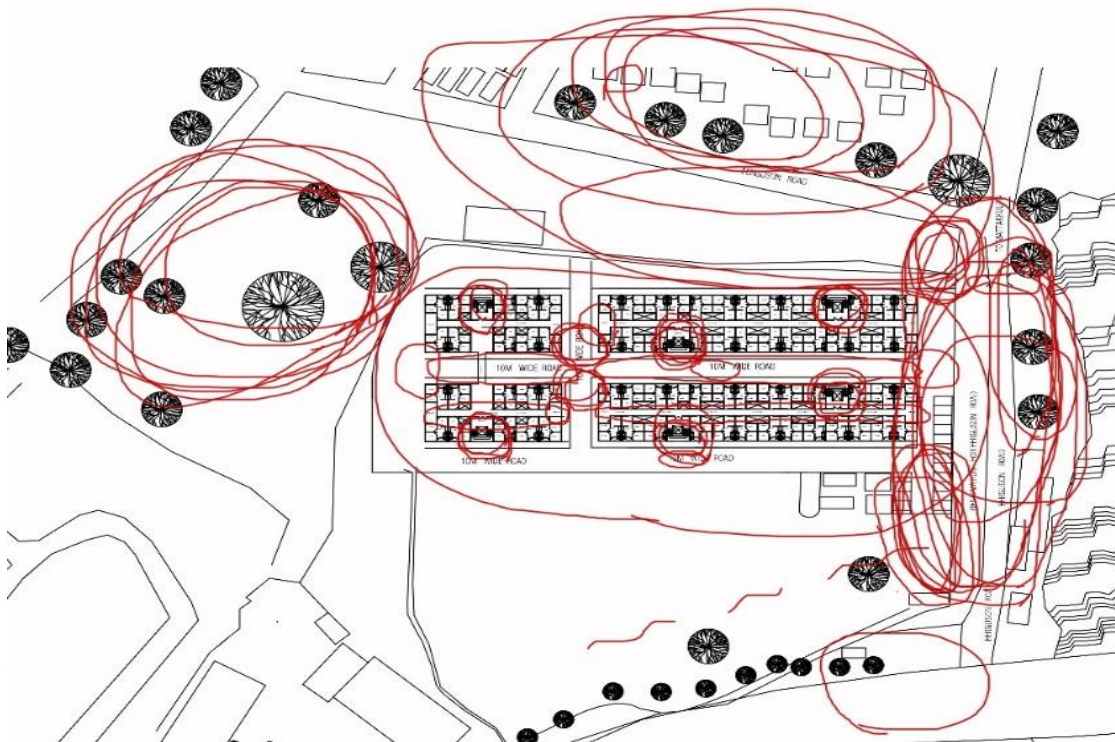


Image 4.21 – Minds maps by Residents indicating unsafe areas in Muwaduru Uyana

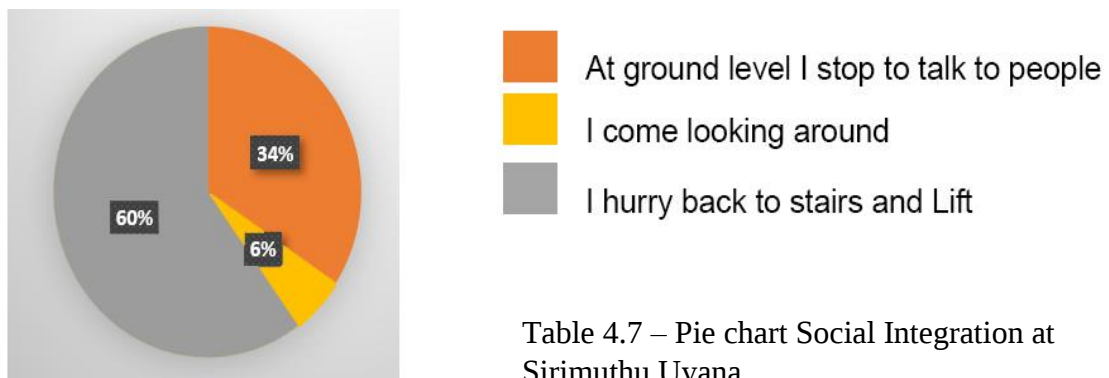
Residents of Muwaduru Uyana have identified following areas as unsafe. front area where the main road is , Block A ground floor corridor and staircases, Playground area adjoining no man's land where garbage is dumbled and the neighborhood low income settlement areas.

4.4 Case study 2- Sirimuthu Uyana

4.4 a – Finding from the questionnaire survey

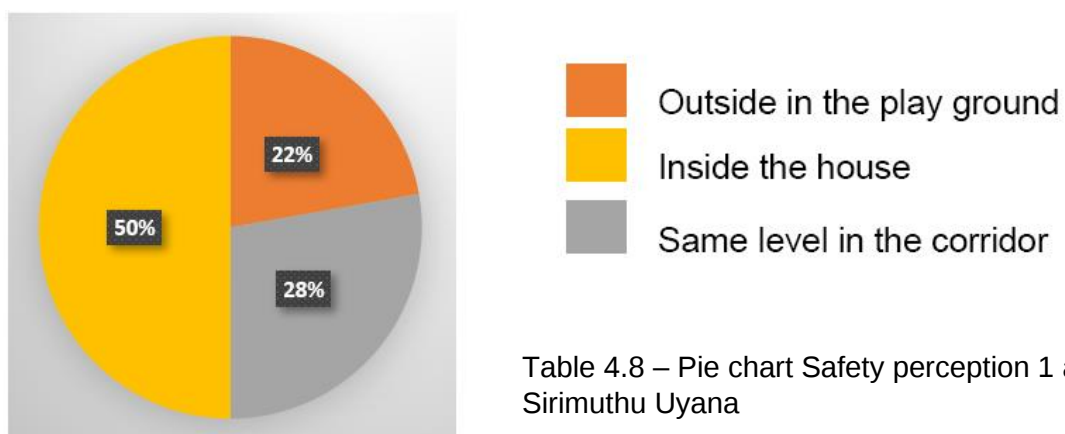
In finding how safe residents felt number of questions were asked. 40% of the 30 people had relaxed moods when coming from road to house. Majority of 60% of hurrying to the Lift may be a reflection of more than half of the population of this community were Muslims and the majority respondents to the questionnaire were women.

When coming from road to the house



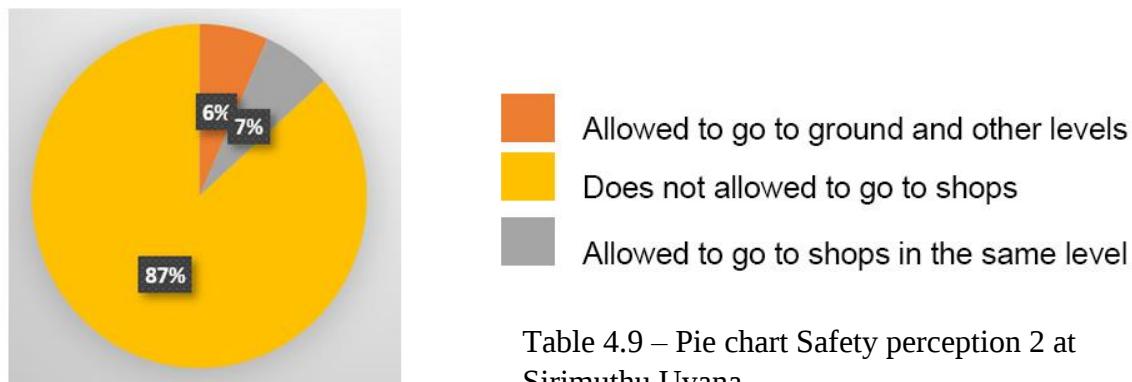
Where do you let your children play

In terms of where they let children play inside the house and outside is 50% for both.

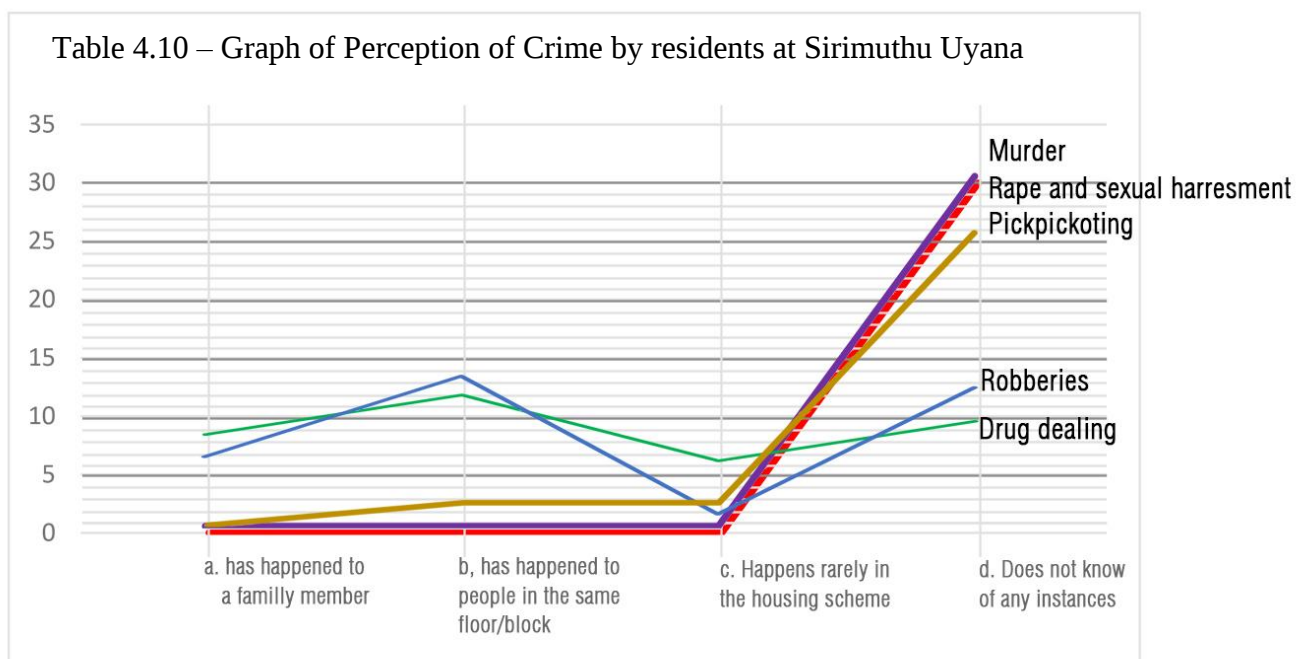


Overwhelming number of children are not allowed to go to shops.

Do you allow your children to go alone to shops

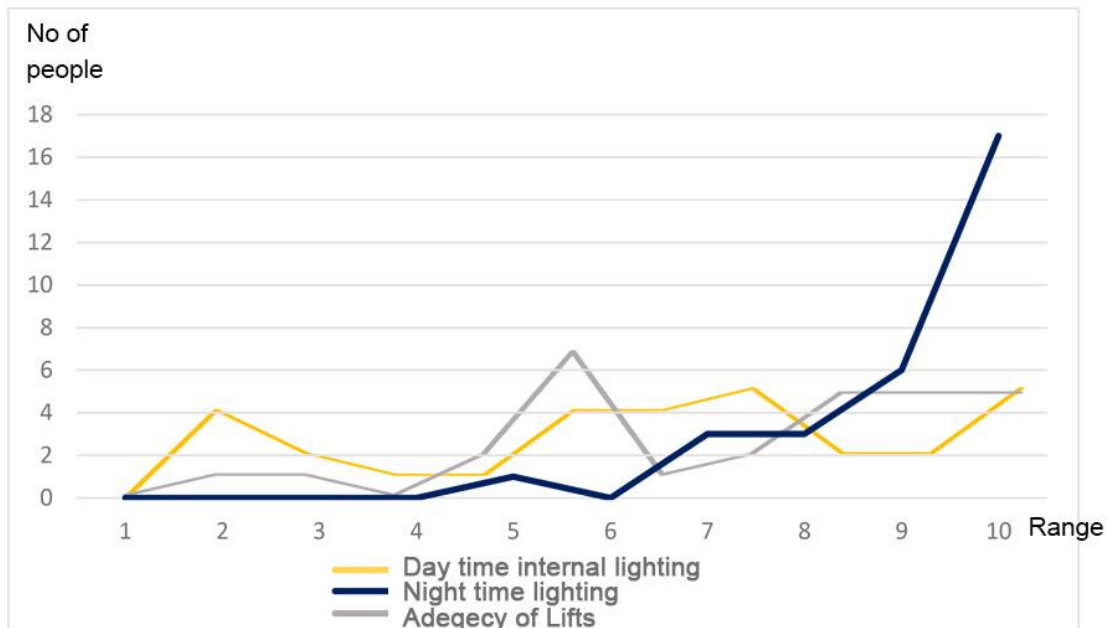


Below graph show what residents think of the frequency of different types of crimes. In this all residents have said there is no sexual harassment and murder in Sirimuthu Uyana. Graph indicates almost half of the people know of people who have been victims of robberies and are aware of drug dealing happening in the same floor or block.



To determine how other facilities contribute to safety, 3 questions were asked.

- Whether there is adequate daylight from the road the entrance of their unit during daytime.
- Whether there is adequate lighting from the road the entrance of their unit at nighttime.
- Whether number of Lifts are adequate



In this 1 is very bad, 5 is adequate and 10 is very good.

Table 4.11 – Graph of perception adequacy lighting and Lifts at Sirimuth Uyana

As per the graph more than half said there is very good night time lighting, however day time lighting is medium and adequacy of lifts is also in the medium range.

These conditions do not provide cover for criminals therefore, it creates a safer environment.

Below chart shows the summery of the survey done regarding territoriality, Natural surveillance and image.

Survey results - Sirimuthu Uyana			Ground floor				1st floor				2nd floor				3rd floor				4th fl				5th floor				6 floor				7th				8th				9th floor				11th floor				Total	%
Block no			A	A	B	C	C	D	D	B	C	C	D	D	B	C	C	D	D	A	D	B	C	D	D	A	D	B	C	D	D	C	A	B	C	D	D	B	C	D	D							
Territoriality																																																
1	Do you sweep outside your door and the immediate corridor no 0 yes 1		1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	100						
2	Do you sit outside in the corridor or in the balconies? no 0 yes 1		0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	1	1	0	1	1	0	9	30					
3	Do you keep things outside your house in the corridor or in no 0 yes 1 some times 1		0	1	0	0	0	1	0	1	0	1	0	1	1	1	1	1	1	0	1	1	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	1	1	0	1	17	56.67					
4	Are you your family members of any social group in the dev no 0 yes 1		0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	7	23.33							
Natural Surveillance																																																
1	How many neighbour's do you know by name a. I know 2 families by name in my floor b. I know 5- 10 families by name in the block c. I know half of the families by name in my floor d. I know all of the people by name in the block e. I know 5-10 families by name in the block f. I know all the residents of my block by name g. I don't know anyone by name																																															

Table 4.12 – Summery sheet of Survey results; perception of Safety at Sirimuthu Uyana

56% of people keep things outside in their corridors and all of them sweep and mop, not only the immediate front of their doors but the whole corridor. While more than $\frac{1}{4}$ of population sits outside in the corridors and balconies. This shows residents displaying an extremely high level of territoriality over the premises. Also almost $\frac{1}{4}$ of them belong to different clubs and groups run by the LIHRH. This also indicates their acceptance of residency in the place and the willingness to participate in common activities of LIHRH. We can say as per the survey, territoriality is very high in Sirimuthu Uyana.

Natural surveillance

More than $\frac{1}{2}$ of the respondents knew all the people in the floor by name. 86% had someone staying throughout the day in the house and more than $\frac{1}{4}$ of them left their house doors open for some to come in. These behaviors and knowledge they displayed shows that they know who their neighbors are and trust them. This trust of the neighbors is a very important in natural surveillance. That they will look after each other's back. This is what provides natural surveillance.

50% left their keys with someone in the floor. This again shows the same trust and therefore, we can say as per the survey that natural surveillance is extremely high.

Image

Only 3 people said there are unused places in their floor and 3 said they knew of empty spaces in the LIHRH. Where there are empty spaces, it degenerates the place and creates a bad image Which leads to increase of crime in the vicinity. (Jane Jacobs, 1961) Therefore, this low number of empty space good for its image. 30% of people posted images of the LIHRH in the social media which indicates that they are not ashamed of their living environment. Therefore, we can conclude that Srimuthu Uyana is very high in image.

4.4 b – Photographic survey

On Territoriality

- i. A unique feature is that in front of almost all the houses of the upper levels they have defined the threshold as their own. They have laid claim to part of the corridor by placing a carpet and keeping shoes and shoe racks outside. This displaces a confidence that no one will steal shoes kept in front.

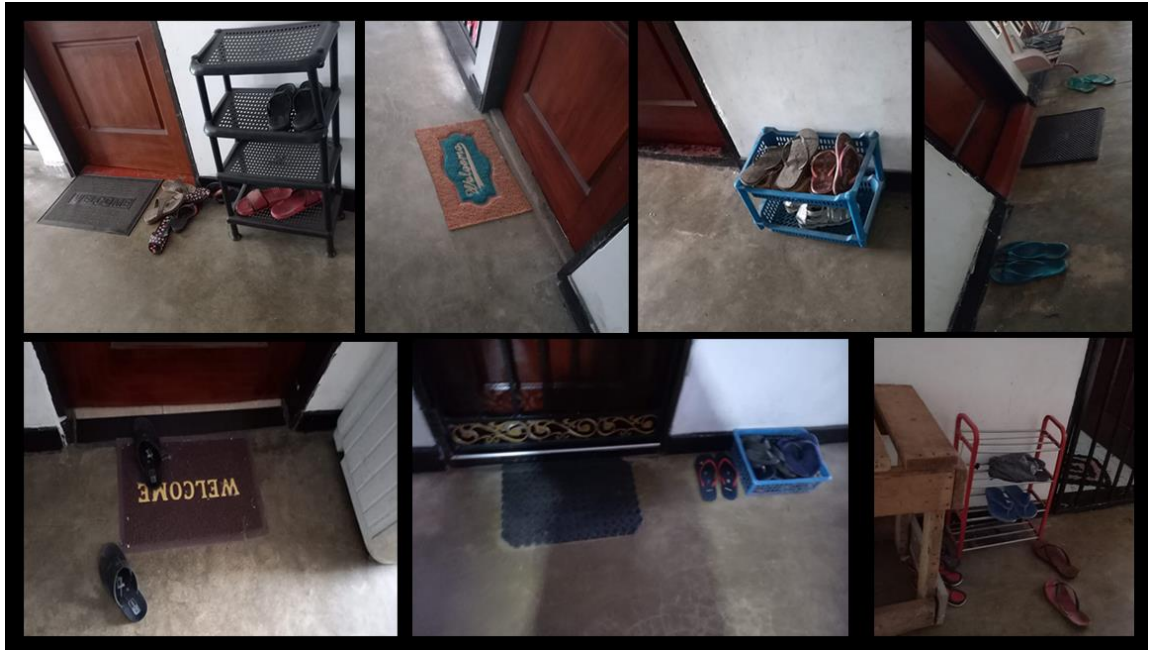


Image 4.22 – outside unit main door the territoriality can be seen with shoe racks and carpets

- ii. Doors and the wall area surrounding the entrances were sometimes decorated to indicated ownership and cultural beliefs of the residents. This was sometimes further extended to the floor lift lobbies as well.



Image 4.23 – Territoriality of the units shown via decorations and plaques etc.

- iii. Towels racks in the corridors was a common sight.



Image 4.24 – Expressions of Territoriality

- iv. In the corridors there were many chairs kept which indicated that public corridors have been converted into private living rooms.

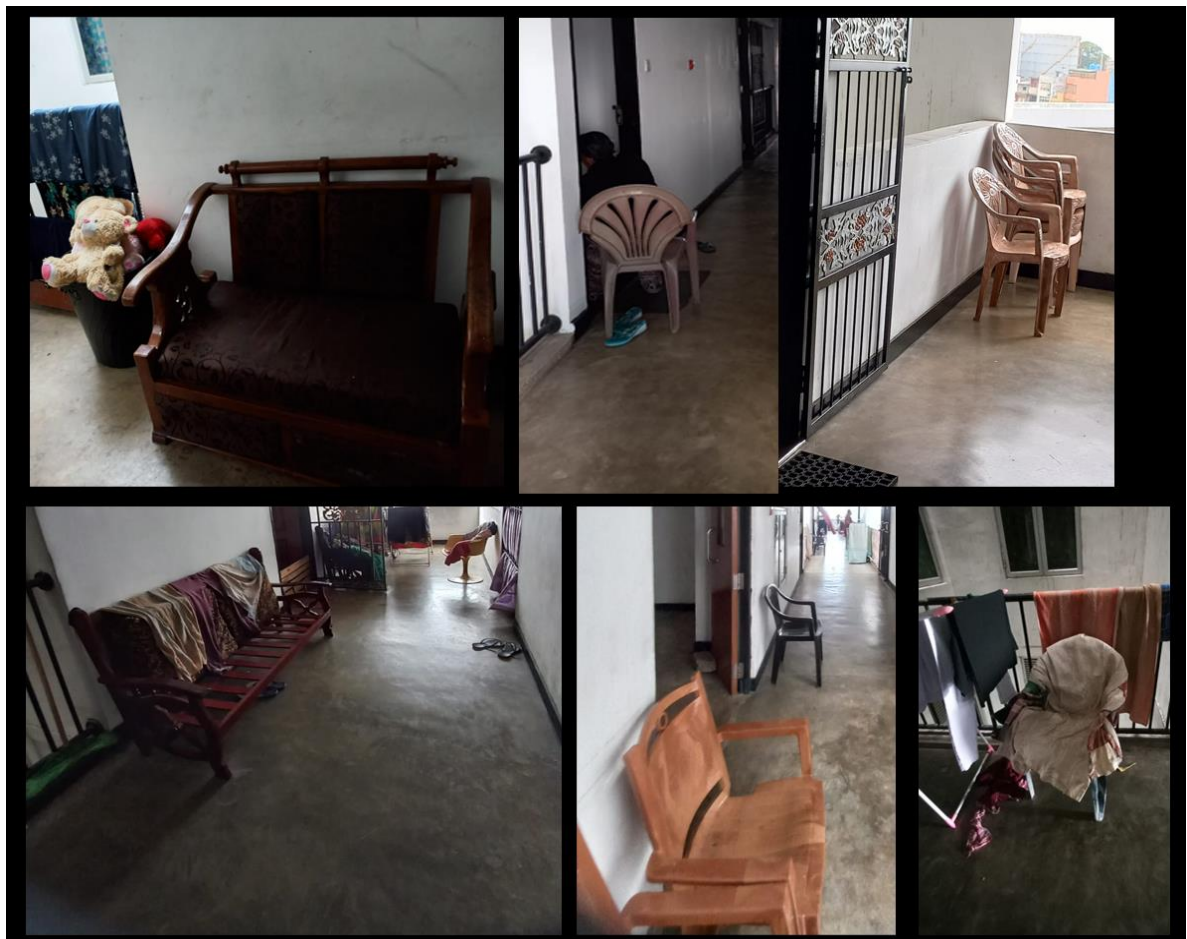


Image 4.25 – Territoriality displayed by chairs in the internal corridors

- v. Plants kept in upper level corridors and in ground level front yards

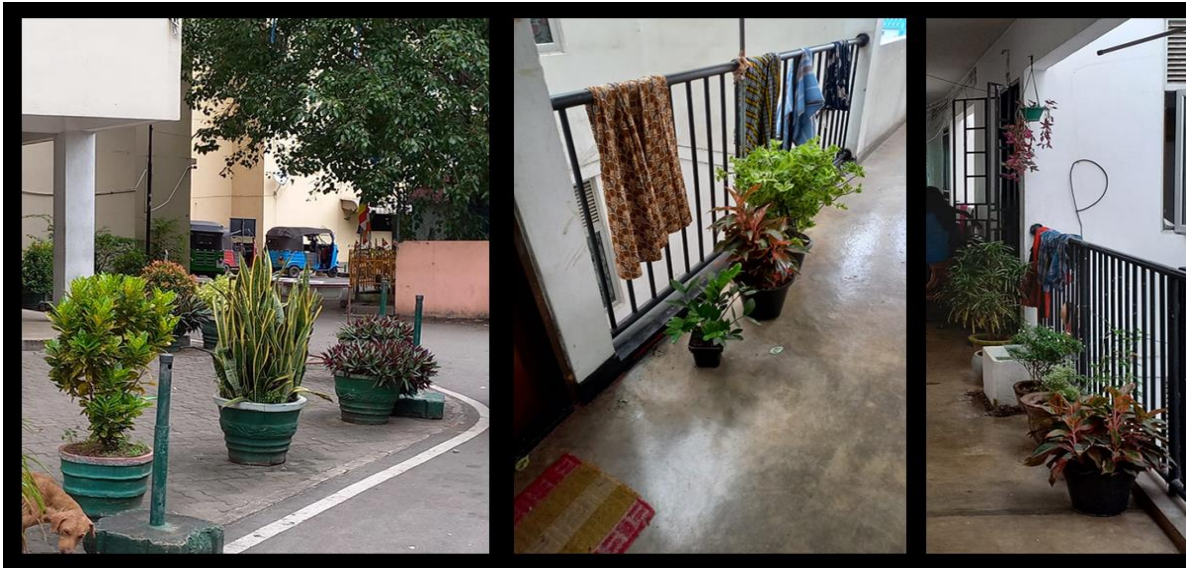


Image 4.26 – Territoriality of outside and balconies via placement of plants

- vi. Other equipment such as washing machines, fridges and many children's bicycles were in the corridors of the upper levels.



Image 4.27 – Territoriality of the internal corridor with household items

While these serve as functional requirements they also indicates the psychology of the inhabitants and a sense of security and that things would not be taken away. None of these objects in the corridor were chained or locked down to prevent theft. These placing of objects in the front corridor defines those residents of this development have claimed the immediate front of their door and the public corridors as their territorial grounds.

On natural surveillance

- i. In the corridors many neighbors come outside and talk to each other which indicates that residents know their neighbors and they can easily identify a Stanger and since residents talk to each other in case of an emergency neighbors can come or call for help. This improves the natural surveillance.



Image 4.28 – In the upper internal corridors young people and women socializing

- ii. On the ground floor also at the entrance there were gatherings of people that changed with the time of the day. Sometimes older people , then younger children and after school children playing at the entrances. There was a continuous good surveillance throughout the day.



Image 4.29 – In the ground floor people waiting and involved in recreational activities

- iii. Number of people looking outside from the balconies or spending time next to an upper level window were many.

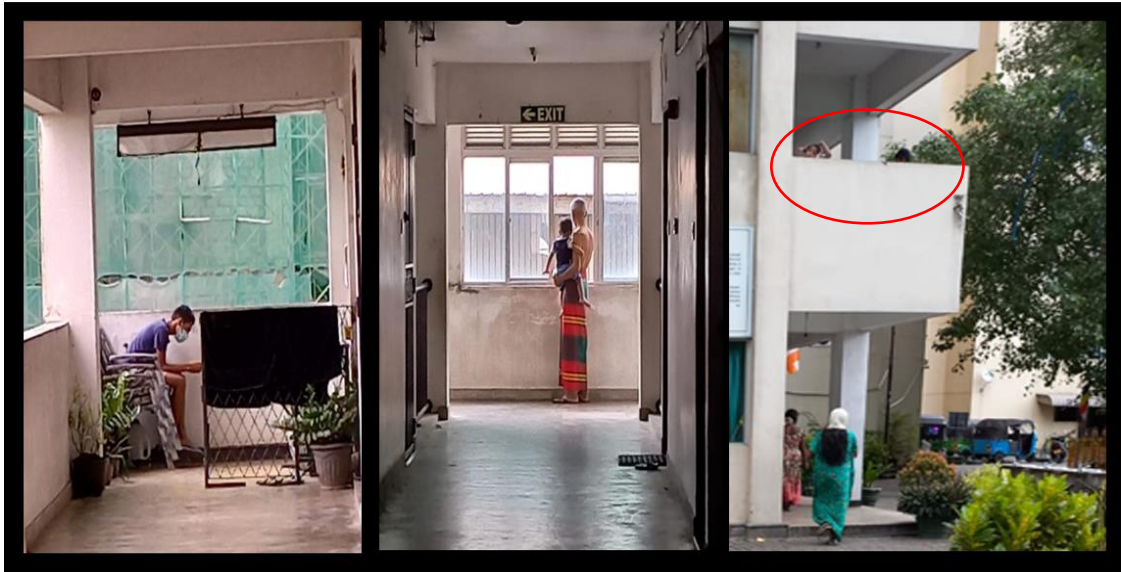


Image 4.30– In the upper balconies Residents in proximity for external natural surveillance

- iv. Rear balconies of the development were lengthwise long along the internal roads, they had kept many equipment such as washing machines, kitchen equipment, and clothes racks on these, which will provide constant road and the next block surveillance by the residents that use these.

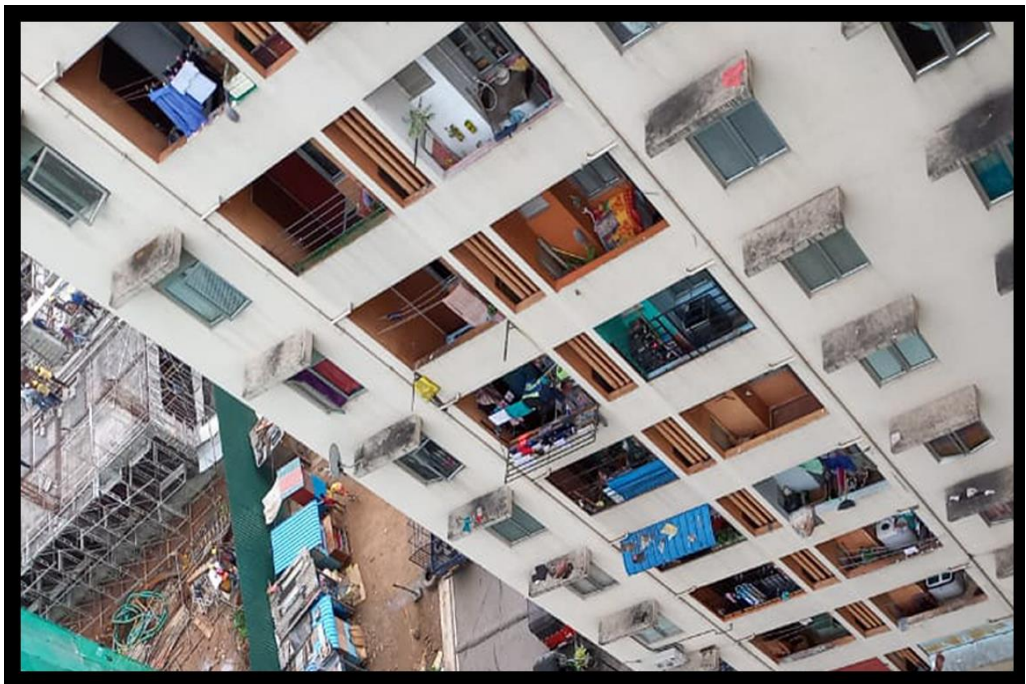


Image 4.31 – Large balconies in upper levels

- v. Number of doors kept half open is very high in this development. In some floors up to 5 doors were kept half open at the same time. In the internal courtyards also many windows were partially open which allows natural surveillance of each other's residences.

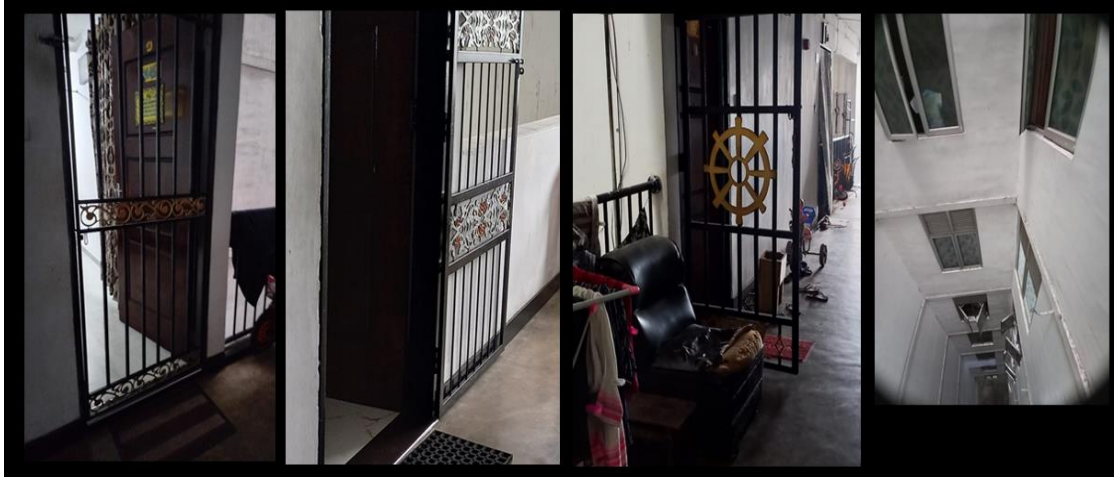


Image 4.32 – Open doors and windows in upper levels

- vi. Another unique feature was the lift lobby doors were always kept open by the residents with help of logs and rocks eliminating hiddenness of the lift lobby. House in front of the lift almost always had the front door kept open which was providing good surveillance of any unknown person entering their floor.



Image 4.33 – Front door of the house right opposite is always kept open

v. There were shops at strategic edge points of the development that provided natural surveillance over large open areas and entrances. In the row of shops in corner of housing development only two are normally kept open and others are used as stores. This area where the closed shops were, was identified by residents as undesirable place



Image 4.34 – Shops in critical axis of the premises

Vi. On shorter side of the blocks, there were blank walls that did not provide any surveillance of the adjacent road but long windows and balconies on the long side and the staggered form creating many surveillance points compensated for it.



Image 4.35 – collective Blank façades in the side



Image 4.36 – Large Windows and balconies

Image

- i. Evidence of better quality in some lift lobbies can be seen

Wood paneling

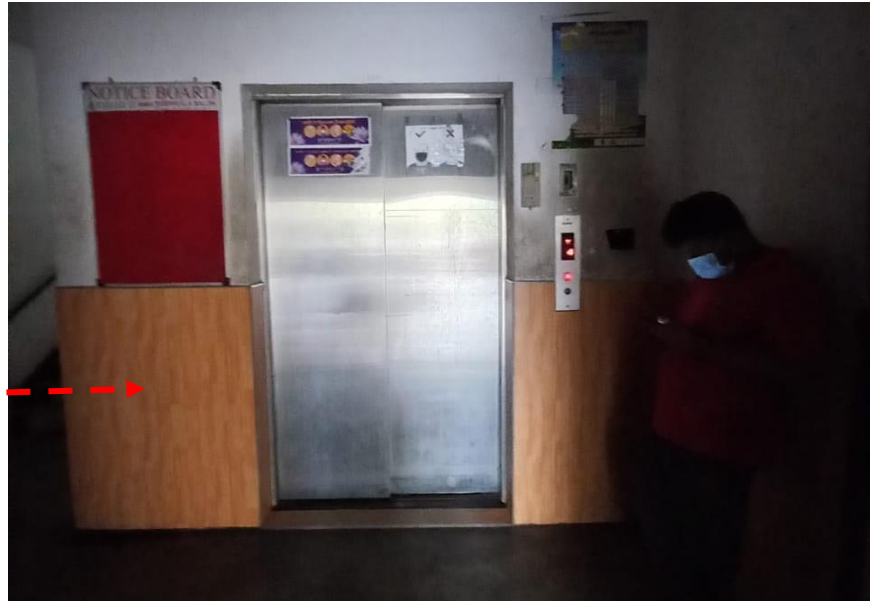


Image 4.37 – Some internal lift lobbies treated and maintained with better quality finishes

- ii. Premises were clean externally and internally, Lift lobbies had no graffiti or dirt marks except in block A. Some litter could be seen on top of the window awnings. But overall, an air of cleanliness and well maintenance prevailed.

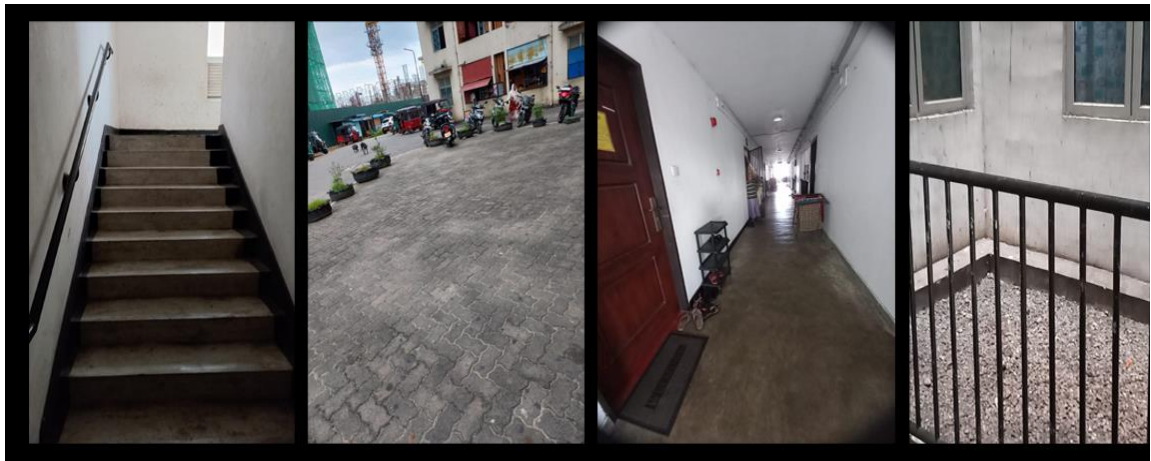


Image 4.38 – clean floor surfaces

4.4 c – Via interviews and observation

Main UDA office on the ground floor employs cctv camaras for the lobbies and the corridors. In addition to this, some private homeowners have installed cctv camaras in the ground floor next to where they park vehicles to avoid vehicle theft.

Police post in the ground level is not functioning due to lack of people in the police. But on the 11th floor 2 houses are given as residences for the police. Therefore, many residents said their presence in the night, deters criminal activity to some extent. Residents indicated a great desire for the police post to be made active again.

There were also large windows on the upper-level balconies that prevented water from entering with ventilation louvers. These brought in lot of light into upper levels as well as providing good surveillance points for residents.

Some houses also had see through steel gates in front of their main door. On the ground floor almost all the houses had steel grills.

4.4 d Mind Maps

Residents were asked to draw circle around where they felt or considered an unsafe area in their neighborhood. Below results show the summery of these results.



Image 4.39 – Summery of Mind maps indicating unsafe areas by residents of Sirimuth Uyana

Sri Muthi Uyana Most people considered the neighborhood as safe. Only the area in the rear where the closed shops are , were consistently identified as unsafe.

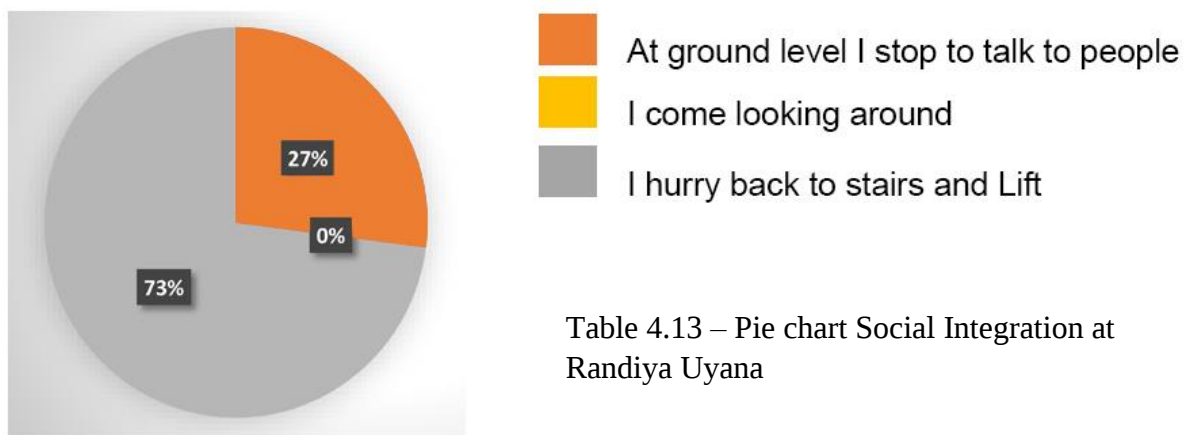
4.5 Case study 3- Randiya Uyana, Heenamulla

4.5 a – Finding from the questionnaire survey

To finding how safe residents felt number of questions were asked from residents and below is the summery of that

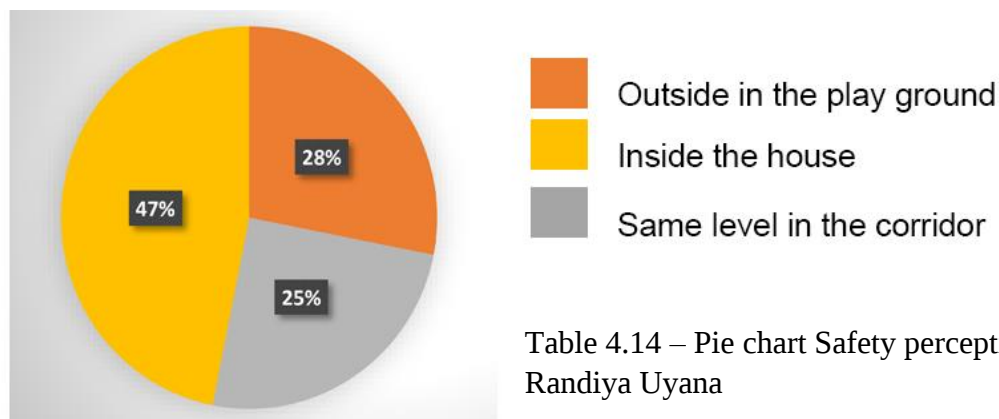
Overwhelming 73% of people hurried back from road to their houses when coming back.

When coming from road to house



A large percentage of children are allowed to go out to the playground to play. $\frac{3}{4}$ of the children are either asked to play in the corridors of the same floor or asked to play inside the house. This indicates extreme attitudes some do not encourage children to hang around in the corridors while others allow them to go to playground.

Where do you let your children play



More than half of the responds do not allow their children to go to shops but at the same time 32% allows the children to go to shops in other levels. This again shows two extreme attitudes.

Do you allow your children to go to shops alone

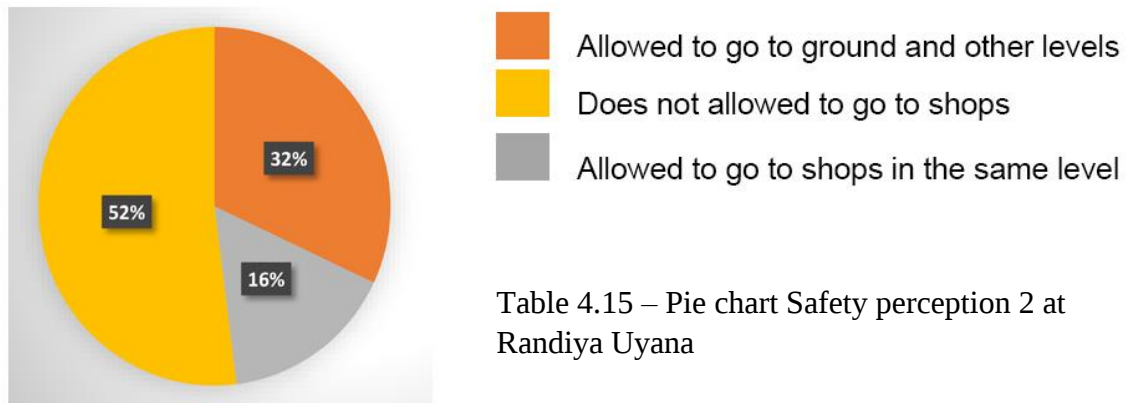
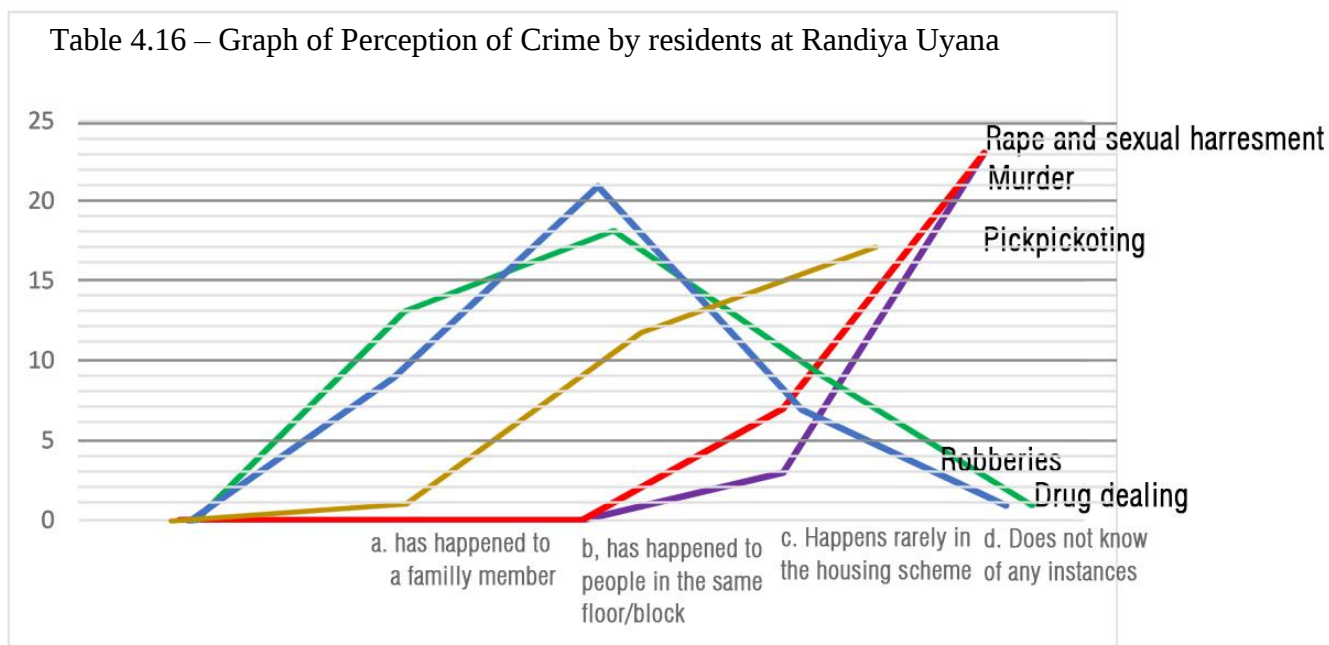


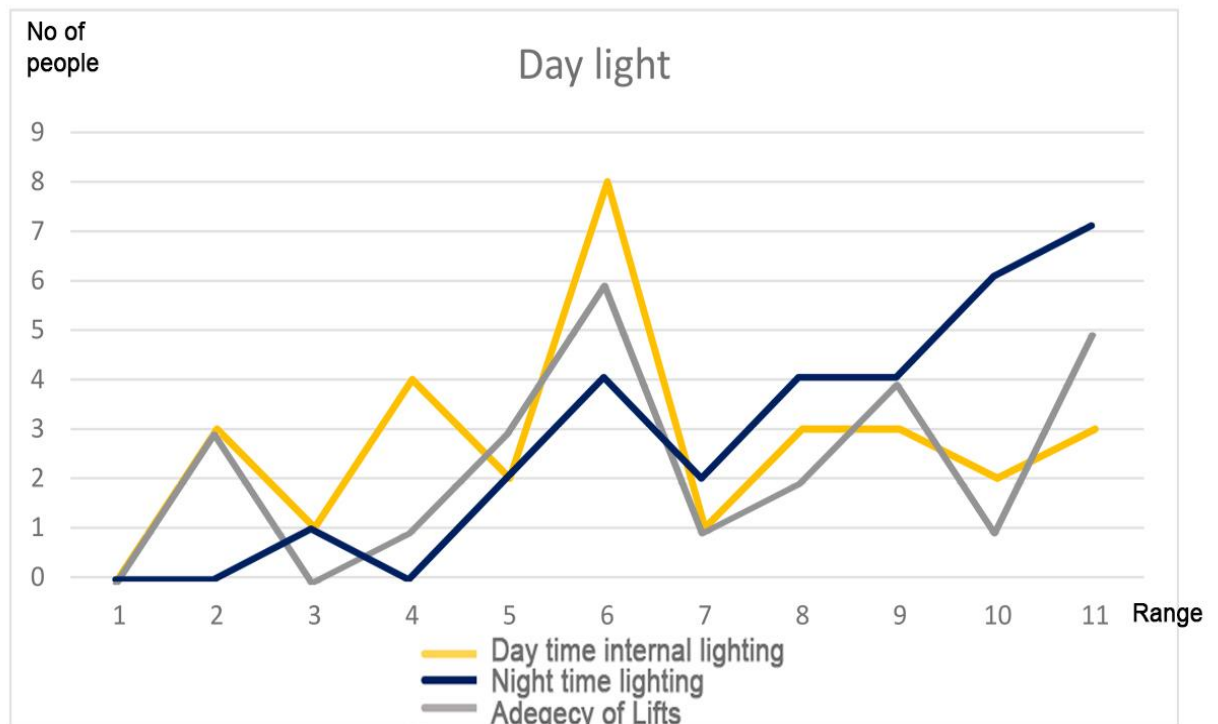
Table 4.15 – Pie chart Safety perception 2 at Randiya Uyana

As the below graph shows Pickpocketing and drug dealing seems to be very high in Randdiya Uyna. Furthermore, when asked about murder cases 4 people refrained from answering. It is interesting to note that all these 4 people who refused to answer that question come from block E.



From these two above surveys we can conclude that there are extreme behaviors of people and that majority does not feel safe in the LIHRH.

In examination of the existing facilities that can affect crime, the following chart shows the adequacy of them as per residents. The chart indicates that majority of residents thought that day light, night time lighting and lifts are on the mid-range of adequacy.



In this 1 is very bad, 5 is adequate and 10 is very good.

Table 4.17 – Graph of perception adequacy lighting and Lifts at Randiya Uyana

Below chart shows the summery of the survey done regarding territoriality, Natural surveillance and image.

Survey results - Randiya Uyana		Ground floor					2n 3rd floor					5th floor					6t		8th floor			10		11th floor			Total	%				
Block no		A	B	C	D	E	D	E	D	A	B	C	D	E	A	B	C	D	E	D	A	C	D	E	E	A	B	C	D			
Territoriality																																
1	Do you sweep outside your door and the immediate corridor area no 0 yes 1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29	96.67	
2	Do you sit outside in the corridor or in the balconies? no 0 yes 1	1	0	0	1	0	0	1	1	0	0	1	0	0	1	1	0	0	0	0	1	0	1	1	1	1	1	1	1	16	53.33	
3	Do you keep things outside your house in the corridor or in the balcony? no 0 yes 1 some times 1	0	1	0	1	1	0	0	0	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	17	56.67
4	Are you your family members of any social group in the development? no 0 yes 1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1	1	1	0	1	0	0	0	0	0	0	10	33.33	
Natural Surveillance																																
1	How many neighbour's do you know by name a. I know 2 families by name in my floor b. I know 5- 10 families by name in the floor c. I know half of the families by name in my floor d. I know all of the people by name in my floor e. I know 5-10 families by name in the block f. I know all the residents of my block by name g. I don't know anyone by name																															
	a. I know 2 families by name in my floor		1	1				1						1							1								5	16.67		
	b. I know 5- 10 families by name in the floor	1				1		1				1								1				1				1	7	23.33		
	c. I know half of the families by name in my floor													1						1							1	4	13.33			
	d. I know all of the people by name in my floor	1										1	1		1				1	1					1	1		1	9	30		
	e. I know 5-10 families by name in the block											1	1	1											1	1			5	16.67		
	f. I know all the residents of my block by name														1					1							1	4	13.33			
	g. I don't know anyone by name					1															1								1	3.33		
2	Do you keep your front door slightly open at times to speak to or for some a family member to come in? no 0 yes 1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	1	1	0	1	0	1	1	0	1	0	1	1	1	15	50	
3	Do you leave your door key or something to be given to some a shop in any of the floors or ground level? no 0 yes 1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	10	
4	Do you leave your door key or something to be given to some a shop in the same floor ? no 0 yes 1	1	0	1	0	0	0	0	1	1	0	0	0	1	0	1	0	1	1	1	1	0	1	0	0	0	1	0	0	12	40	
5	Do you or your family members go to ground floor outside, at any time of the day to spend time or for leisure activities ? no 0 yes 1	1	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	1	0	0	1	0	1	1	0	0	1	0	0	9	30	
6	Do you have some one that stays throught out the day at home? no 0 yes 1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	27	90	
Image																																
1	Do you know of empty houses or unused spaces in your floor? no 0 yes 1	0	0	1	1	1	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	23.33	
2	Do you know of empty houses or unused spaces in the block? no 0 yes 1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	16.67	
3	Have you or your family posted photos of your block and outside the block in the social media? no 0 yes 1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	8	26.67	
4	Do you see garbage and litter around the place ? 1 to 2 3 to 4 5 6 7 8 9 10																															
	1 to 2																															
	3 to 4																															
	5																															
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	20		
	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	13.33	
	8																															
	9					1																										
	10	1	1	1		1	1	1	1		1	1	1		1	1	1												2	6.67		
																													14	46.67		

Table 4.18 – Summery sheet of Survey results; perception of Safety at Randiya Uyana

Territoriality

53% and 56% sat in the outside corridors and kept things in the outside corridors. From the 8 people interviewed from ground floor 5 people did not keep things outside. It is also interesting other than in the top most floor of block C, in all interviewed floors of block C people kept things in corridors. This indicates that block C is considered by the resident of it as a safe environment and they have laid claim to the territory of block C

33% of them belong to various groups of the LIHRH and this indicates that they consider the housing scheme as their territory and willingness to get involved in its community activities.

Natural Surveillance

59% kept their doors open, 40% left their keys with someone in the same floor and only 10% left their keys with someone of a different floor. This keeping the door open is quite high and shows that they trust their neighbors and via this, corridors are naturally under good surveillance.

Leaving key statistics indicates that they trust people of the same floor and not of the other floors. This indicates their natural surveillance is floor based and not block based.

They also have 90% of people 24 hours a day in the house which enables someone in each unit to provide natural surveillance.

Image

Almost $\frac{1}{4}$ (23%) of respondents new of empty spaces in their floor. This is very bad in terms of image since criminal behavior can occur in proximity to such places.

Almost $\frac{1}{2}$ (46%) of them said, situation of garbage is very bad by giving 10 for it. This impacts very badly on the image of a place and can lead into people not wanting to go to such areas and thereby creating isolation which again is taken advantage by the criminal lords and gangs.

4.4 b – Photographic survey

On Territoriality

- i. Some corridors did not have any thing kept in them while others had. In the below pictures, both these can be seen. Bike in the photo 3 was stolen in the week before the survey by an outside 16-year-old boy while been parked in the same place and later recovered.



Image 4.40 – Corridors that lacked display of ownership by residents- bare corridors

- ii. Certain parts of some blocks had many things kept in the corridors. Specially near odd building forms opening to roadsides.



Image 4.41 – Corridors that displayed

- ii. It was noted that in ground level, where there was an extra piece of ground area next to their unit territoriality was extended to that. This happened mainly where there are odd nooks and corners that existed in the built form. In upper level also this is evident.



Image 4.42 – Residents claiming odd corners in Ground and upper levels

- iv. However where there are unclean conditions, this was not evident as in the block B rear area next to a road that flooded from a leaking sewer line, where as just up the road in block A people have claimed their edge.



Image 4.43 – Unclean Ground lvl.

V. Many people in upper levels had kept plants in their corridors. Thus, displaying their territoriality to the area. Once an internal wall was also colored.



Image 4.44 – Plants in internal corridors of ground and upper lvls.

On Natural surveillance

i. Open corridors around the courtyard allowed internal natural surveillance of different floors.

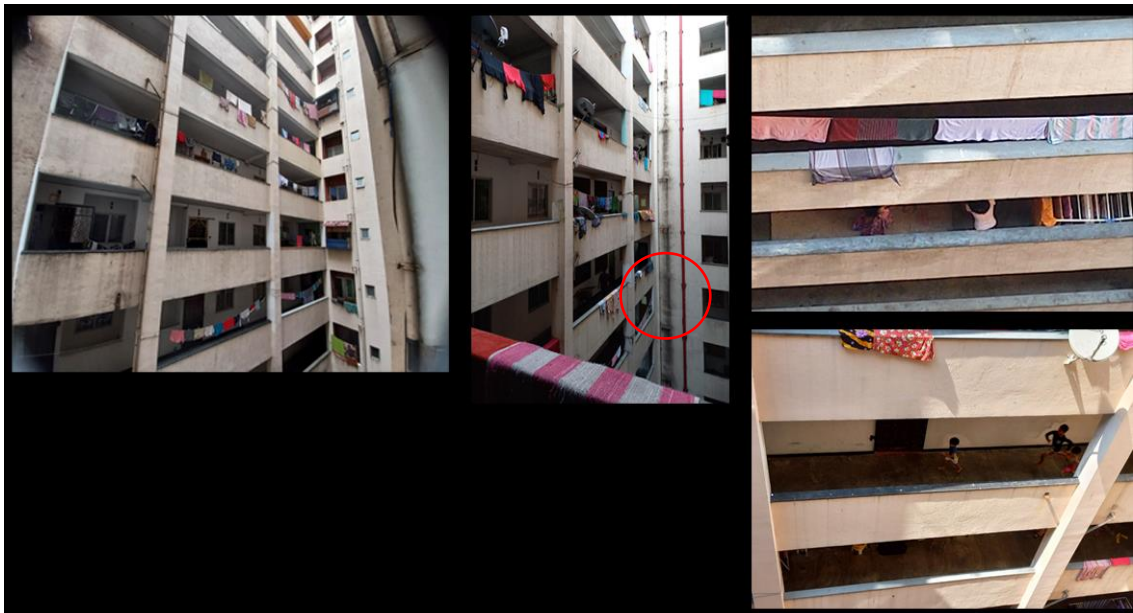


Image 4.45 – Corridors around the courtyard facilitating views of other levels

- iii. Odd corners that protruded out had many people gathering in them and that provided good natural surveillance. Different groups of people occupied this place during different times of the day as you can see in photos 1 and 5.



Image 4.46 – Odd corners in ground level occupied by residents

- iii. The same happened in the upper floors where these protrusions happened. Many gathered in those and talked from floor to floor due to visibility provided by the formation. This is very a good point of natural surveillance.



Image 4.47 – Odd corners in upper levels have become gathering points

- vii. There were many half open doors inside that provided good natural surveillance.



Image 4.48 – Half opened doors in upper levels of some of the housing units

- iv. Internal Streets were very wide and had dedicated wide pedestrian pavements that made the ground level streets full of people during daytime.

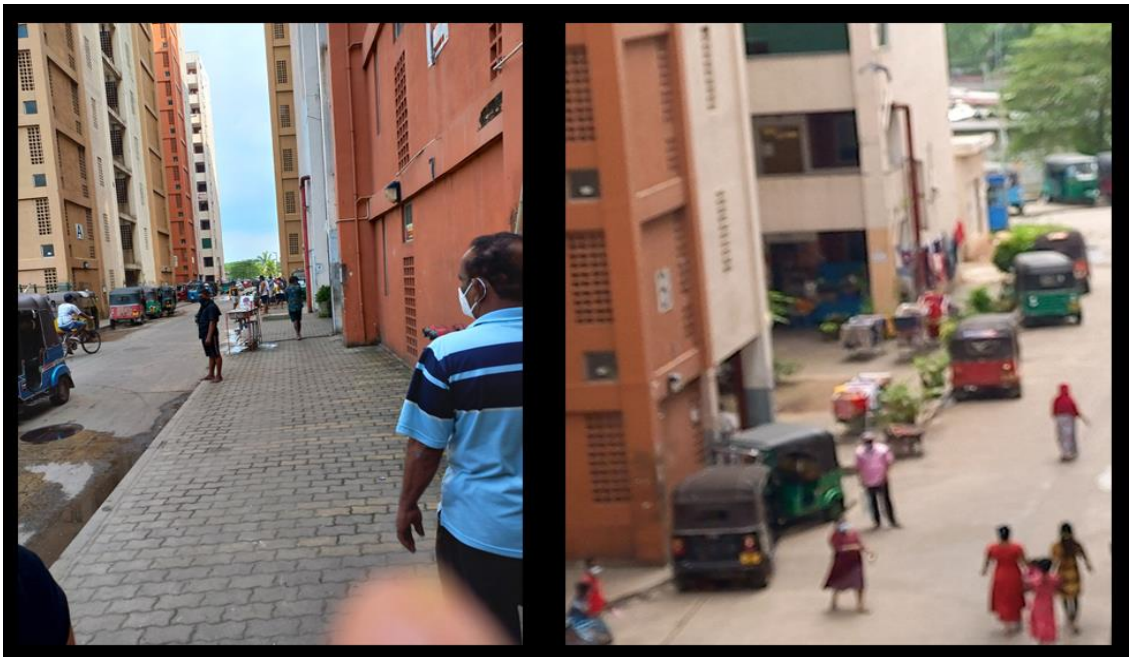


Image 4.49 – Views of Internal streets

vi. Some of the smaller windows have been made into store rooms in upper levels by protruding outside and this blocks the view of what is happening in the surroundings and is very bad in terms of natural surveillance.



Image 4.50 – Window boxes in the external façade

v. On the main access route there are many vendors during daytime providing good natural surveillance.



Image 4.51 – View of access Roads

vi. Playground is active in the afternoon and is located within the surveillance distance by houses. It is not too large also therefore the visibility of the edge is also very good.



Image 4.52 – View of Playground

On Image

- i. The place had litter thrown down from upper level and therefore is very dirty. Specially the courtyard. This is very bad for the image and creates environments suitable for criminal activities occur.



Image 4.53 – Unclean premises

- ii. There are over flowing sewer lines that floods the roads. This happens due to MC closing gate valves for repairs in other areas. Since Randiya Uyana is lower in elevation than those areas back water flows into the development and floods roads. Whenever this happens people avoid such areas due to smell and unhygienic conditions. Some areas that frequently floods have been abandoned by people. This creates a very bad reputation and an image.



Image 4.54 – View of Sewer water flooding streets of Randiya Uyana

Proximity to safe or unsafe areas

Rear side has low-income houses that has access to the back entrance, and they are along the front access route as well. This has adversely affected the development.



Image 4.55 – Low-income settlements in close proximity to Randiya Uyana

4.5 c – Via interviews and observation

By speaking to residents and the UDA representative at site it was discovered that at present there are no cctv camaras though earlier there were 42 camaras installed. They were vandalized and removed by the residents of the development.

Though the approach road is well under surveillance at daytime with many vendors there are no lights in this area at night time. This approach road also has many bends which make the visibility bad. Here close to entrance, recently a resident was murdered over a love affair.

In the front and the back of Randiya Uyana there are no gates and residents said people from other areas come in from the two sides and steal things.

4.5 d Mind Maps

Residents were asked to draw circle around where they felt or considered an unsafe area in their neighborhood. Below results show the summery of these results.

Randiya Uyana



Image 4.56 – Mind maps by the residents of unsafe areas of Randiya Uyana

In Randiya Uyana, east side boundary area and the roundabout area in the North was consistently recognized as unsafe areas. Some staircases, rear space close to block B and the entrance road area was also identified as unsafe.

4.6 Analysis of maps and plans

4.6a Territoriality

In Muwaduru Uyana

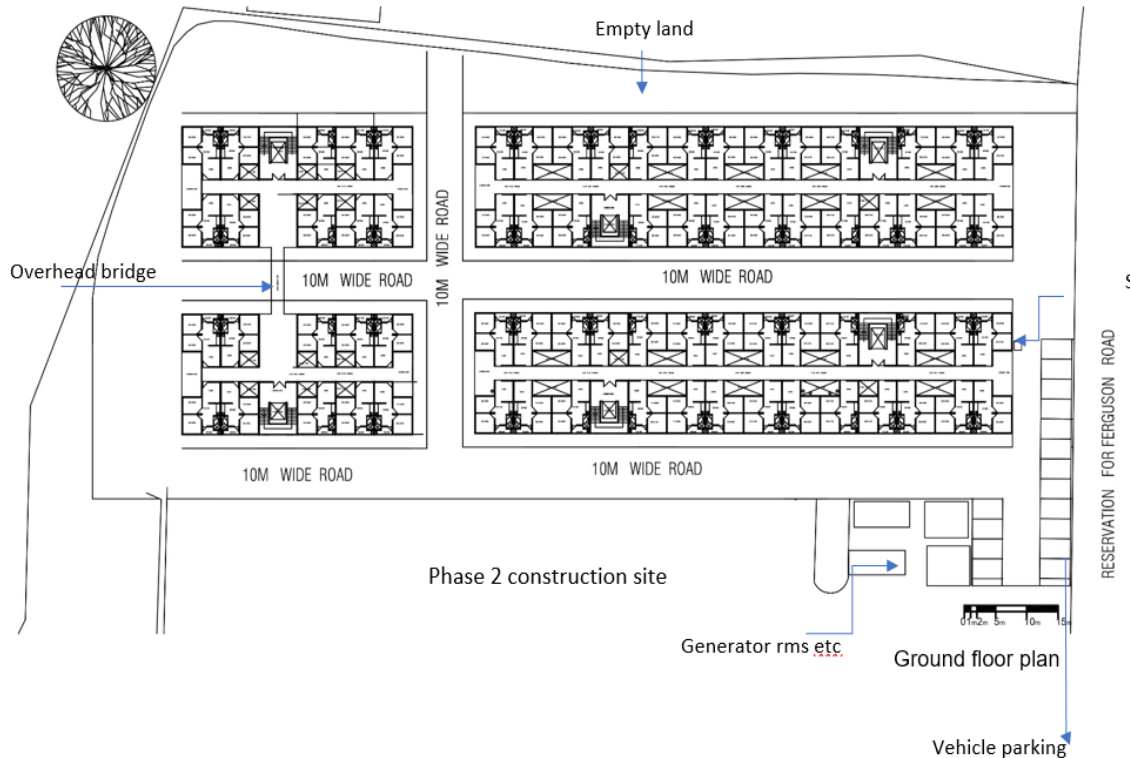


Image 4.57 – Ground level plan of Muwaduru Uyana

As seen in the plan ground level is totally taken by roads and therefore there is no place on ground floor to claim as resident's territory. There are no boundary walls also next to the Ferguson road or on the north side which allows anyone the right to come in. Long blocks (Block A and B) contain 26 units per floor and therefore, to come to an agreement with so many people about owner ship of areas is difficult. Since there are many residents in a floor even to claim the internal corridor of the floor for residents is difficult. Linear parallel layout of blocks does not create any areas or niches at the ground level for people to congregate as groups. Empty land on the north side is separated from the block by an internal roadway therefore no one at ground level claims it as their own and has become a no man's land.

Smaller blocks C and D has 10 units per floor, and it is possible to form a community per floor and lay claim to the floor. But the Overhead bridge at level 3,6 and 9 doubles

the number people's access to these floors. Therefore, those floors lobbies are also difficult to be claimed by a group of people due to large numbers going through these.

In Sirimuthu Uyana

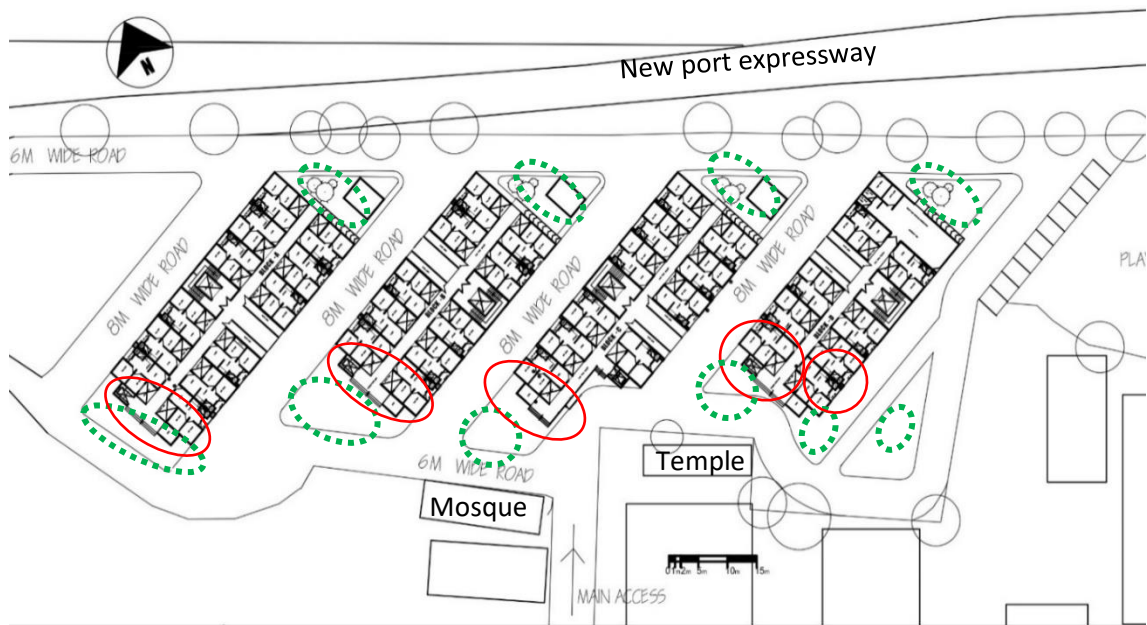


Image 4.58 – Ground level plan of Sirimuthu Uyana

Number of units per blocks are smaller(12, 10, 10 and 8) and it easier for people of a floor to lay claim to it as their own territory.

Notches in the building form and the free areas at the entrances and the rear (marked by green circles) have the possibility for people to lay claim to these as their own ground. Though these have not been divided and given to people, groups have laid claim to them via landscaping.

Built form has interesting corners at the entrances which encourages groups to gather in these places at different times of the day as their territorial area. These are shown in red circle.

Boundaries are well defined at present and as a cul de sac development, only the residents and visitors to meet them come to the Housing development. There is no through traffic in terms of vehicular or pedestrian that occurs.

In Randiya Uyana



Image 4.59 – Ground level plan of Randiya Uyana

Nooks and corners that are created by the built form as highlighted with red circles allows these to be owned by the residents. In the ground floor though legally these have not been given to them, residents have claimed them as their territory.

However, ground floor middle courtyards that are hard landscaped are littered by garbage from the above floors. Though this area has the possibility to be claimed by residents, nobody does so at present.

4.6b Natural surveillance

Muwaduru Uyana

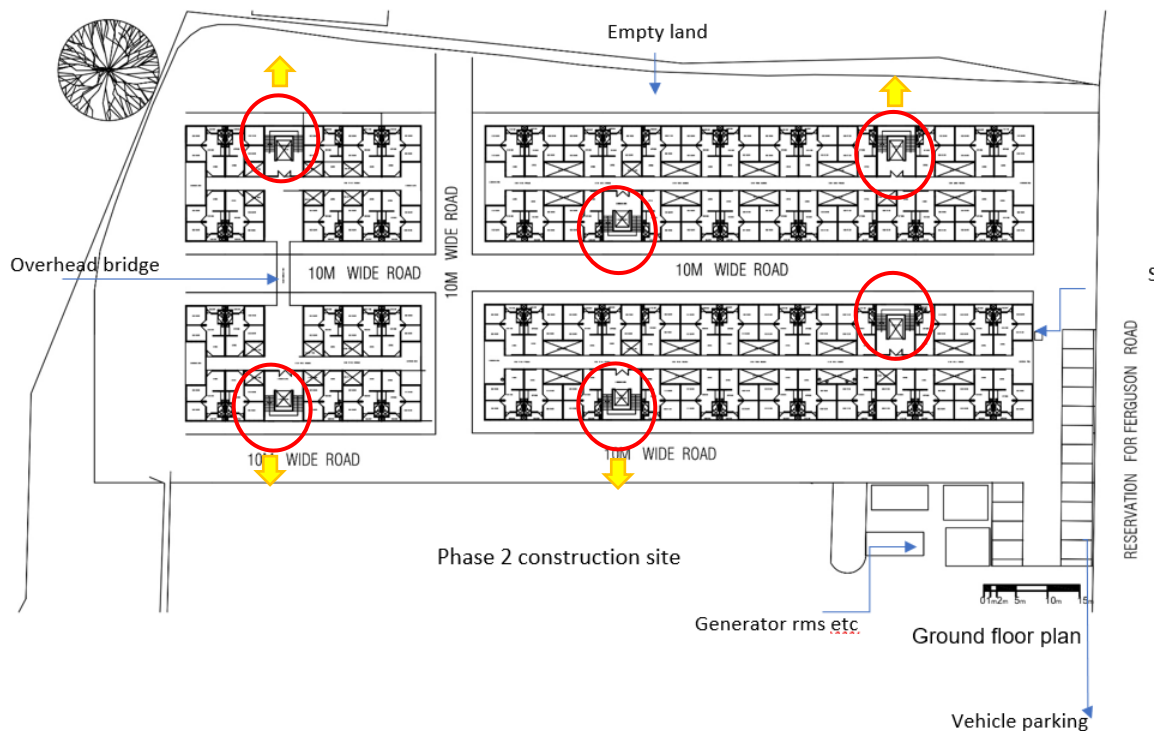


Image 4.60 – Ground level plan of Muwaduru Uyana

In the long blocks, lifts and staircases are a long way from the entrance and therefore natural surveillance from road is lacking. Furthermore, lift lobbies are inside fire doors which cannot be easily observed by anyone in the corridor. Stairs wrap round the lift, though there are windows on the stair landing, there is no one to observe through the window since these faces blank roads and empty spaces on north and south sides. (indicated by yellow arrows) These areas behind the lifts and lacks natural surveillance.

Parallel blocks to each other, only in the middle road area provides at upper levels, surveillance of the rear of each other's apartments. But the balconies and windows in these are small for people to provide adequate observance.

Two stack corridor does not provide natural surveillance unless the residents of the floor lay claim to their floor and act in such manner. Shorter side of the building only faces the public road, Natural surveillance by road is lacking.

There are no planned shops that could have provided natural surveillance. Though there are individual shops in floors run by residents.

Sirimuthu Uyana

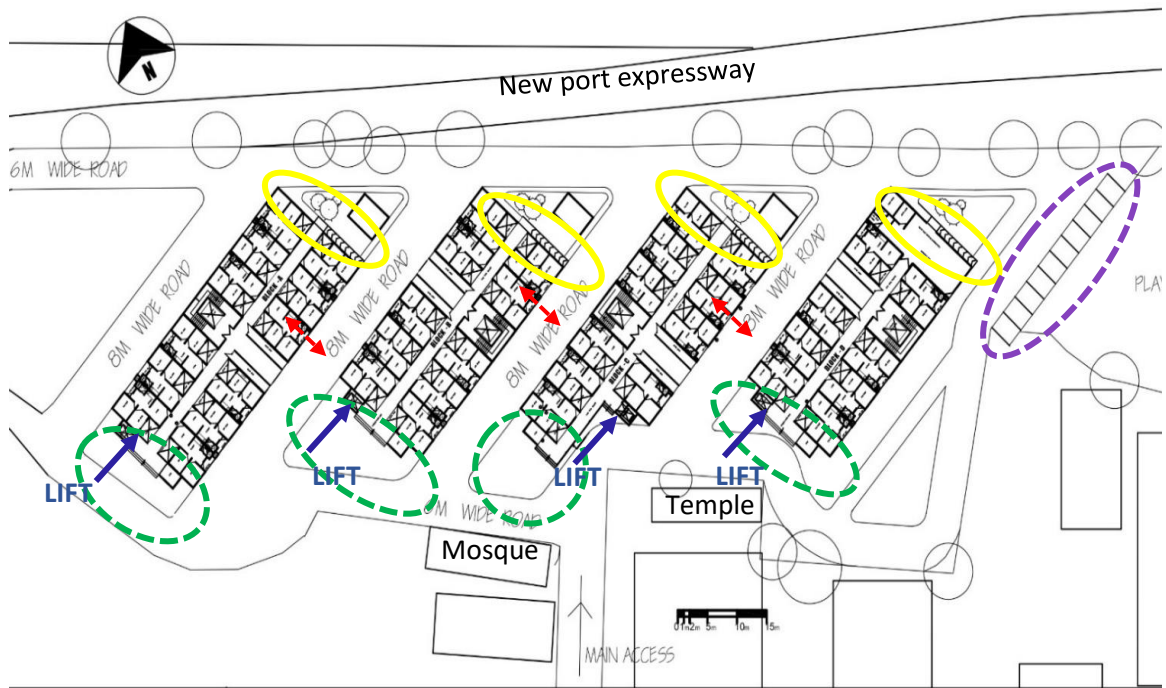


Image 4.61 – Ground level plan of Sirimuthu Uyana

In this LIHRH four blocks faces each other, which enables natural surveillance of rear side of each other's units. This is furthermore helped by the long balconies and the windows on those facades. This is shown by red arrows. Long windows and balconies on the roadsides enable the roads also to be under surveillance. However, the 2-stack system makes the internal corridor non conducive to natural surveillance.

There are blank facades at the short ends and these collectively in the scheme creates a blank side, especially in the rear. Which is shown in yellow circles and can be seen in in photo A. This Lacks surveillance.



Photo A



Photo B



Images 4.62,63 and 64– Varying different facades of Sirimuth Uyana

However, the staggered form allows part of the long side to be visible to this rear side which enables natural surveillance via its balconies and windows as shown in the picture B of front façade.

Staggered form at the edges encourages people to gather because those areas define a degree of coziness. This staggered form protrudes out into the road areas which makes them good look out points for the surrounding area and the roads. These areas are shown in green circles.

In front of each of the lifts there is an entrance at ground level which enables quick access to the lift if you exit from a private vehicle. In this LIHRH There are lifts right in front in an open verandah which is shown in blue arrows. These lifts and the lift lobbies are always under natural surveillance and these are the lifts preferred by residents also.

There is a stair case on the opposite side as well.

In Sirimuthu Uyana there is a dedicated area for shops as shown in purple circle. This should have been very good since it comes in the rear blank side. However, only two of these shops are open out of ten. Due to this, shop area is identified by resident as unsafe.



Image 4.65 – Lift opening to an open lobby immediately next to the access road

Randiya Uyana

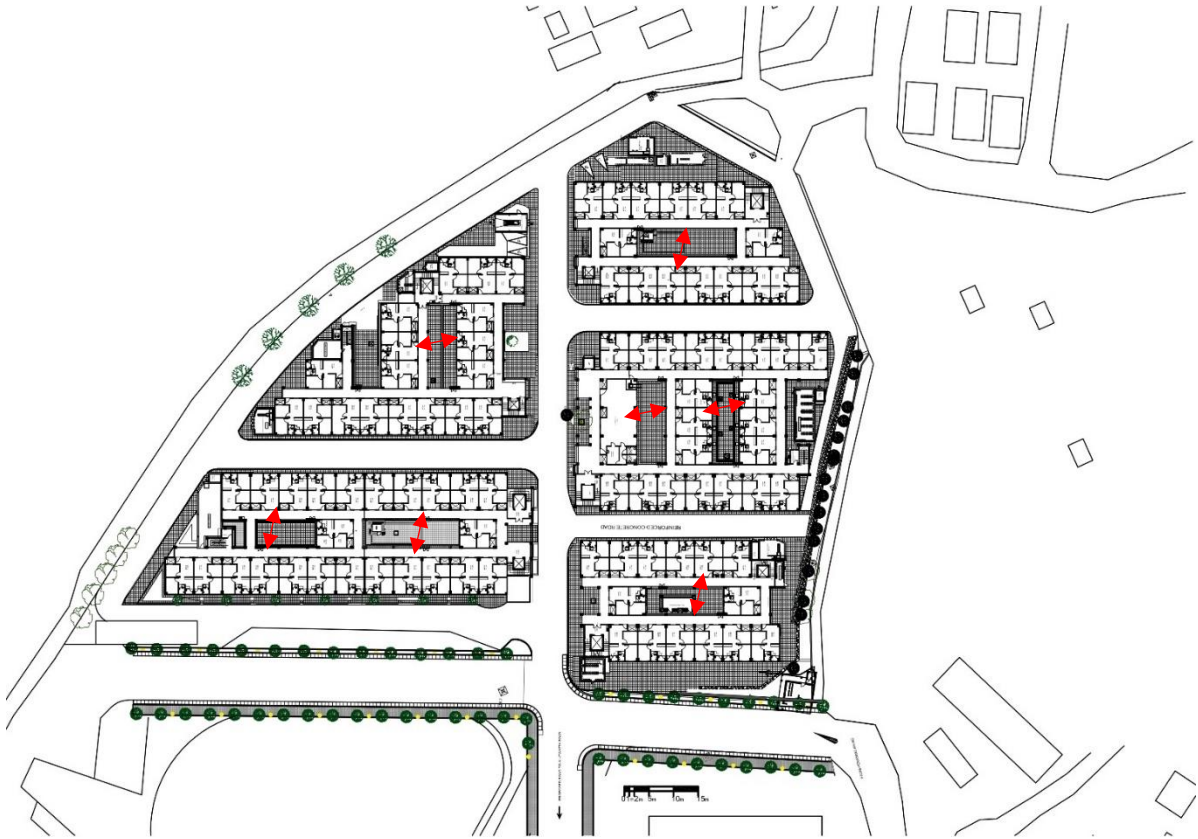


Image 4.66 – Built form of Randiya Uyana

Protrusions create nooks and corners for people to gather which provides good natural surveillance. This happens in the ground level as well as in the upper levels

These protrusions also create from upper levels, good watch out points over the road network and the playground.

One stack system around a courtyard with open corridors creates good natural surveillance of the opposite corridor and vice versa as shown by red arrows.

4.6c Image

Muwaduru Uyana

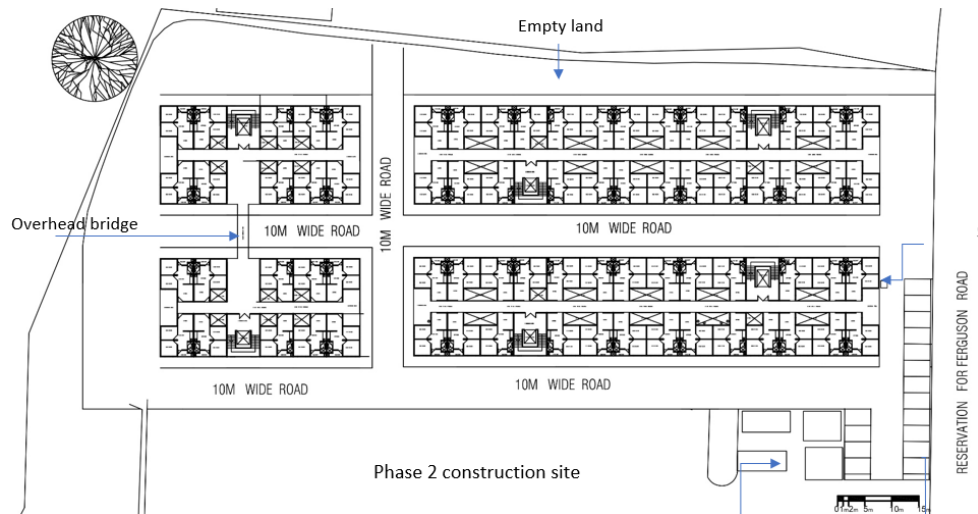


Image 4.67 – Built form of Muwaduru Uyana

In built form, the long form is typical of most of the LIHRH developments built by the UDA and therefore does not carry a good image. Two shorter blocks with the bridge connection are unique and this has potential for a very good image. But in combination with the two long form, advantages of this unique form are lost.

Sirimuthu Uyana

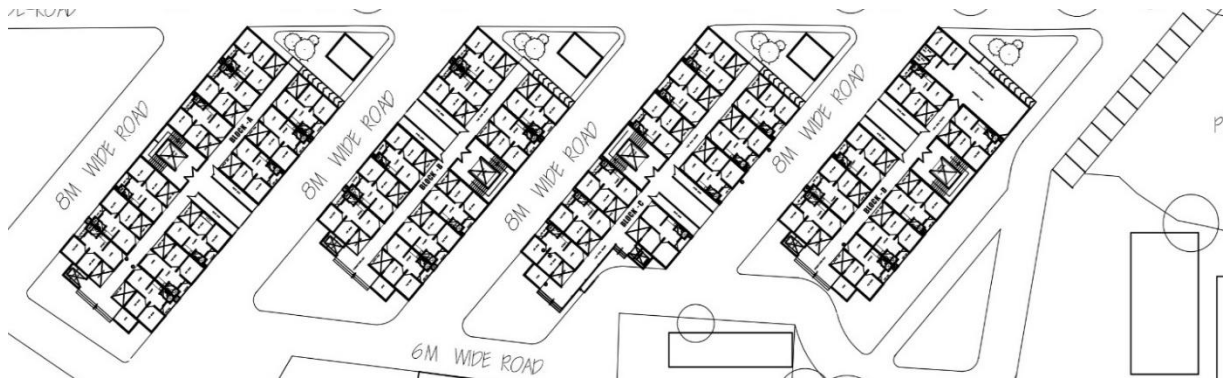


Image 4.68 – Built form of Sirimuthu Uyana

This staggered form is very unique and each building varies from the other. Therefore, it represents a very good image.

Randiya Uyana

Though the built form has staggering to make it unique, The sheer size and the number of unites make these staggered edges irrelevant to provide a unique identity. What is seen most of the time is the long façade and is bad in promoting a good image as seen in the photo.



Image 4.69 – Long facade of Randiya Uyana

Location and size of Randiya Uyana's Playground is good for natural surveillance. Long side of one housing block is parallel to this to provide good natural surveillance over it as shown in red arrows. Size of the playground enable a person to identify people at the extreme edge.

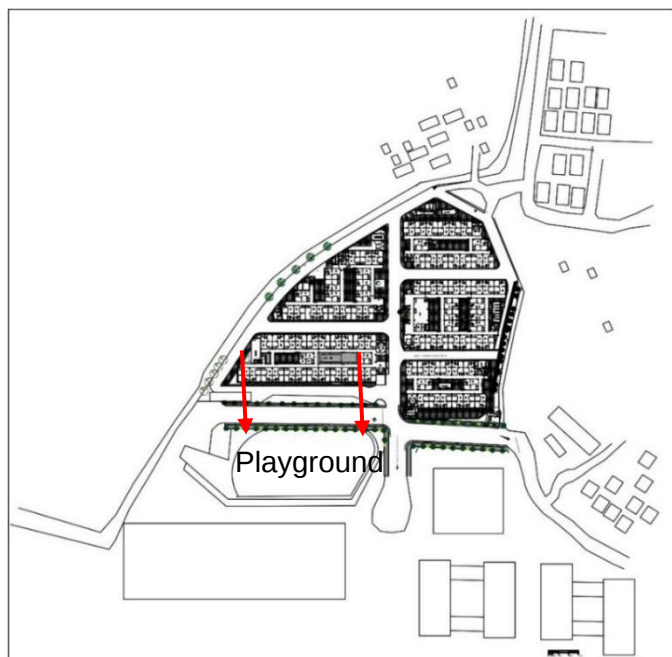


Image 4.70 – Location of Randiya Uyana Playground

4.6d Proximity safe or non-safe places

Muwaduru Uyana

There is no police post or such institution close by to provide a safe environment. There are lot of low-income housing along the Ferguson Road which has a bad influence upon the development. On the opposite side of the road is the river that anyone can come and hang around.

Siri Muthu Uyana

There is no police post in the proximity but there are two police houses in the upper levels of the LIHRH that acts as a deterrent to crime. Surrounding area has large warehouses which does not have many people. These do not provide security. There is the port access route adjoining one boundary, this will have heavy fast moving vehicular traffic but no pedestrian movement, therefore this also does not provide any safety.



Image 4.71- Adjacent Ware houses



Image 4.72- New Port road and high way

Randiya Uyana

There are no police stations and other safe institutions in the vicinity. But one side is bound by the ela which limits people from entering.

Proximity to other large low income settlements has an adverse effect in the LIHRH as can be seen in contextual map and marked in yellow circle

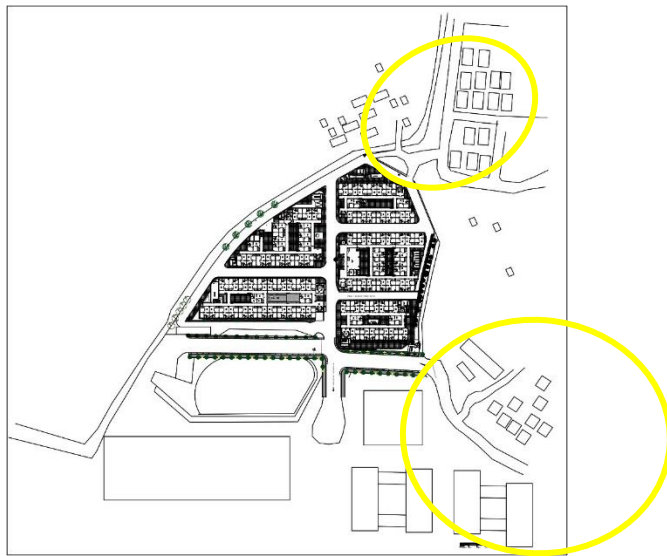


Image 4.73 – Low-income settlements near Randiya Uyana

Summery-

Three case studies of Muwaduru Uyana , Sirimuthu Uyana and Randiya Uyana were studied using the following methodologies – questionnaire survey, interviews, mind mapping , photographic survey and cartographic analysis. Using these methodologies case studies were assessed under the developed theorical framework of territoriality, Natural surveillance, image and proximity to safe and non-safe places.

These studies indicated Muwaduru Uyana built form and the behavior of residents supports crime occurrence and is not perceived as a safe environment. Randiia Uyana also has crime but not to the intensity of Muwaduru uyana. Sirimuthu Uyana is perceived by residents as the safest environment out of the studied 3 case studies and built form has many attributes that deter crime occurrences.

CHAPTER 05 – OVERALL ANALYSIS AND RECOMMENDATIONS

5.1 Police crime data

Muwadora Uyana and SiriMuthu Uyana Housing schemes come under the jurisdiction of the Grandpass police station and Randiya Uyana housing scheme is under the jurisdiction of Mihijana sevana Police station. Mihijana sevana police station was recently established to serve specially for LIHRHs of Heenamulla. Since it was established recently crime records were available only for 6 months, therefore to tally with other crime records- double of 6 months data was taken. Also in muwaduru Uyna It was noted by police that other police divisions also do raids on it. This data was unavailable at the Grandpass police station. These other raids are carried out by Colombo police division and country wide crime division .

Crime Data provide by the Relevant police stations is shown in the below chart.

Crime date for the year 2021				
		Muwadora	SiriMuthu	Randiya
	Type of Crime	Uyana	Uyana	Uyana
1	Drug related crimes	360	60	160
2	Rape and Sexual harresement	3	nil	10
3	Pickpocketing	nil	nil	nil
4	stealing and Roberries	25	24	20
5	Murder	1	nil	1
6	Gang fights	120	nil	50
7	Domestic violence	65	24	72
8	Threats and verbal abuse	221	15	120

Table 5.1 – Police Crime data relating to 3 case studies

Grandpass police station also noted that most of the drug dealers and other criminals reside and operate from Muwaduru Uyana housing scheme. That there are many more cases in Muwaduduru Uyana which they are unable to raid due to the way it is located with multiple escape routes.

As per table 5.1, the highest no of crimes are in Muwaduru Uyana and second is Randiya Uyana. As per the crime data we can say that Siri muthu Uyana is relatively safe.

5.2 Analysis of Surveys- framing the problem areas

Survey data is analyzed in relativity to each other. Also, certain LIHRH communities have different attitudes from where they have originally come. Such as in the Randiya Uyana where children have low levels of education due to parents lack of care for the children. Due to this attitude of parents allow children to freely roam around in spite of crime occurrences and drug dealing. There are children drug addictions that happens in the Randiya Uyana. In Muwaduru Uyana, since most are from the earlier neighborhood and interrelated, Long term residents allow their children to go around in spite of ongoing drug dealings. Whereas in Srimuthu Uyana though a high level of Natural surveillance can be seen and crime is less relatively, most children are not allowed to go to the playground area which cannot be seen from housing blocks and children are not allowed to go to ground floor for play. Most gather in their own floors and play. Some upward mobile parents consider sending children to shops a demeaning thing. These cultural attitudes are also reflected in the survey. Whether the playground is under natural surveillance is a key factor in sending children out to play.

In the question where you let your children play

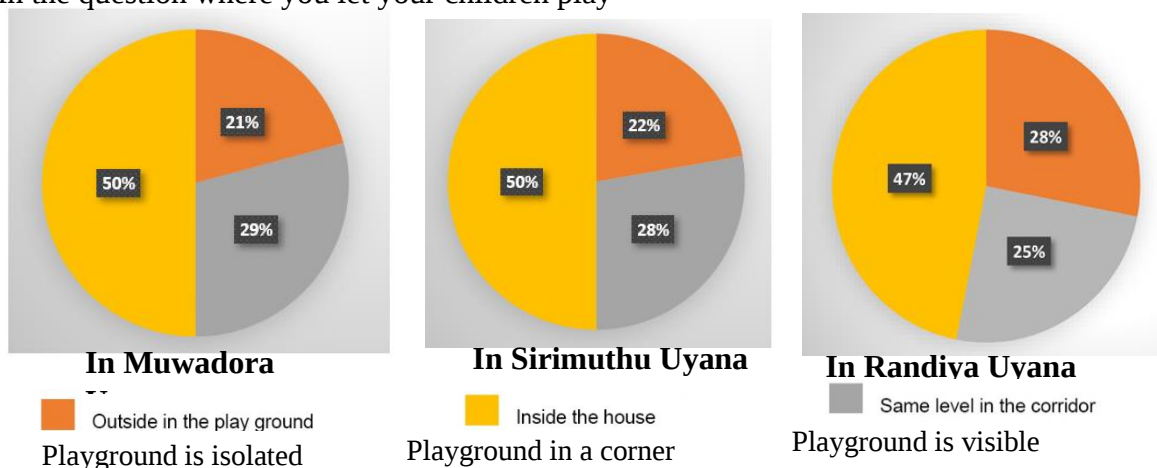


Table 5.2 – Relative analysis of pie charts in safety 1

Where the best visibility of the playground is(Randiya Uyana) has the highest number of children playing in the playground. Therefore, we can say the visible location and the appropriate size of it for surveillance make playgrounds more populated and safer.

To the question of whether children are sent to shops-



Table 5.3 – Relative analysis of pie charts in safety 2

In this Where it is most safest children 87% of children are not sent to shops. This is a cultural bias of upward mobility parents of Sri lanka.

Despite these, Via several different surveys carried out it is evident that Sri Muthu Uyana is relatively safe and crime occurrences are Low. It also has a very high system of Natural surveillance due to conducive built form.

Where as in Muwaduru Uyna drug dealing incidents and crime is very high and most residents considered only their dwellings as safe.

In Randiya Uyna certain areas of the neighborhood were only considered unsafe by the residents. There was also drug dealing. This housing scheme reported crimes relating to children/girl abuse which was nonexistent in the other 2 housing developments.

As per the photographic surveys Natural surveillance is extremely high in Srimuthu Uyana and medium in in Randiya Uyna and Very weak in Muwaduru Uyna. In producing a good image Sri muthu Uyana is again better due to its quality of materials, cleanliness and unique staggered form. Muwaduru Uyna despit belonging to the phase

two and more recent than the Randiya Uyana Image is very bad due to it's lack of maintenance and cleanliness.

It was also found that well-lit access corridors by daylight encouraged more expressions of territoriality and Natural surveillance which is very good for the safety of the LIHRH.

Surveys carried out via different methodologies show that Muwaduru uyana is most likely place to have crime and next is the Randiriya Uyana. In Sirimuth Uyana built form and environment does not support crime activity much. The police crime records shown in table 5.1 supports this observation. Therefore, we can conclude that there is a direct link between the physical form and environment and the number of crime occurrences in LIHRH.

Following Relationship of Crime/Safety to Territoriality, Natural surveillance, Image and proximity to safe places can be deducted via the analysis.

- iii. When the territoriality, Natural surveillance of the residents increases over their premises and image of improves and the LIHRH is located in proximity to safe areas crime decreases –Inversely Proportional relationship
- iv. When the territoriality, Natural surveillance of the residents increases over their premises and image of the improves and LIHRH is located in proximity to safe areas Safety Increases –Proportional Relationship

Therefore, after looking at different aspects of built form and the environment via survey we can conclude that in the studied LIHRHs below listed attributes affected the crime and safety of these housing schemes.

In Muwaduru Uyana

as per survey findings we can conclude that certain characteristics in the built form and the environment has created areas that propagate crime. These are

1. Nonexistence of a boundary/wall or fence that allows outsiders to come in freely.
– non definition of territoriality
2. Large 2 front building blocks that has too many people in one floor that does not allow them to come to a common agreement in defining their ground which was seen in the photographic survey. Whereas in the 2 smaller blocks people took over their front corridors. - Territoriality
3. Ground floor residual spaces are separated by internal roadways that does not allow residents at ground level to define them as their own private space. These spaces have become garbage and crime areas. - Territoriality
4. Connecting Bridges brings more people to 2 smaller blocks thereby increasing the number of strangers in floors of 3, 6 and 9. This makes identification of criminals/ strangers difficult. – Natural surveillance
5. Long building forms that does not face public busy roads or other housing or institutions that does not facilitate natural surveillance. - Natural Surveillance
6. Small windows and balconies that does not facilitate a good view outside and also does not facilitate residents to come out and spend time in their balconies.
- Natural Surveillance
7. Lift and lift lobby areas in the middle of LIHRH are hidden from most public view and are susceptible to drug dealing. Some lifts were purposefully broken, so that these areas become isolated by people. - Natural Surveillance
8. Staircases behind the lifts have become places where drug addicts would hang out due to their non visibility. - Natural Surveillance

9. Dark Corridors in Block A and B are used for drug dealing Since even at daytime it is dark inside. No houses in ground have doors or windows kept open to the inner corridor - Natural surveillance
10. 2 stack system, especially in block A and B has created an inner corridor that cannot be seen by others. - Natural Surveillance
11. Inner courtyards have lot of Garbage in them and Ill lit, therefore most people do not open their windows in these courtyards. - Natural Surveillance
12. Water and unfixed sewer leaks in some areas have led to unhygienic conditions in certain dwellings that would result in residents leaving their houses. This has happened in many such dwellings and the interviewers of such places were tenants. If houses are put up for rent, they are bought by drug lords and other criminals for low rates and used as unlawful activities. This has happened in some places - Image
13. Long building blocks and standard finishes does not allow any individual expression and therefore in one glance can be recognized as a LIHRH which leads to a place stigma. Name of “Uyana” implies that it is a government building for low-income people. This would propel upward mobility residents to leave the LIHRH. Tenants who come for short term does not care for the long-term conditions and bonding with people of the place. Thus, the natural surveillance of the area becomes poor.
- image/Natural Surveillance
14. Non availability of police or other institution in close proximity to deter crime has affected the LIHRH - proximity to other facilities
15. People from the Surrounding low-income communities come to the LIHRH and this has increased the crime occurrences and affected the safety of residents
- proximity to other facilities

In Sirimuthu Uyana

As per the survey findings this is relatively a safe environment and incidences of crime were less. Following positive built forms and environments have enabled and reinforced these conditions.

1. Extremely high territoriality was displayed, despite been a 2 stack system in the inner upper level corridors this is mostly made possible due to the smaller size of the block. – Territoriality
2. The development is at the end of the road with well-defined boundaries therefore any outsider is immediately recognized and there is no through traffic through the development. - Territoriality and Natural surveillance.
3. Smaller blocks have allowed residents to lay claim to their upper-level inner corridors. - Territoriality
4. Staggered form has created many niches and corners both in the ground level and upper levels to form good places for natural surveillance and therefore the degree of natural surveillance is extremely high in this development.
- Natural Surveillance
5. placing blocks parallel to each other have allowed blocks to be surveillance by each other. - Natural Surveillance
6. Large balconies and windows have facilitated good internal and external visibility and allowed people to spend time in their balconies.
- Natural Surveillance
7. Lifts and staircases in the corner only with half walls have made lift lobbies very visible to the public and therefore safe. - Natural Surveillance
8. Shops at critical places in ground floor to provide natural surveillance
- Natural surveillance
9. Quality of material used, unique staggered built form and the cleanliness of the place has created a better image and residents are not looking to move out of the LIHRH unlike in the other development. Therefore in long term, as people's economic level improves, better facilities will be initiated as can already be seen by some people installing private cctv Camaras and making the environment a more safer place. - Image/Natural Surveillance

10. Police residence at the upper-level influences as a deterrent to crime occurrences. -Proximity to other facilities
11. There are cctv Camaras in the facility that are monitored from the UDA office

Following bad environment was also found in Sirimuthu Uyana.

1. Closed shops have created areas where crime occurs.
2. Blank facades all directed in one direction creates areas that lack natural surveillance. However the staggered form and large balconies, windows and the angular location helps in mitigating this situation. - Natural Surveillance

In Randiya Uyana

As per the survey findings some areas of the built environment is unsafe and certain external factors are affecting the development. Built form at the same time have certain positive aspects that help in reducing in crime. These are as follows

1. Buildings have projections and staggering at the end which allows creation of niches and corners for people to occupy. - Territoriality
2. In Ground floor, residual spaces are next to the building and roads are beyond these. Therefore, people have extended their personal area into these spaces, these left-over spaces are not no man's land. They have become somebody's territory which discourages strangers/outsideers from coming into such spaces. - Territoriality
3. One stack arrangement eliminates inner blind corridors. Visibility is good. - Natural Surveillance
4. Built form projections in upper levels creates good look out points, gathering places that provides natural surveillance. - Natural Surveillance
5. Units are arranged around a well-ventilated wide courtyard, this distance from two wings of the same block allows for very good natural surveillance across floors. - Natural Surveillance

6. Playground is located parallel to housing Block A and at the entrance to development and therefore constantly under surveillance. Block C upper-level common balcony area also opens out towards the playground.
- Natural Surveillance
7. Size of the playground is such it facilitates someone to see very clearly what is happening at the other end of the playground, therefore it is difficult for suspicious activities to be carried out there.
- Natural Surveillance
8. There are good wide sidewalks that facilities people to freely walk around the facility without having to move out for vehicles. These pavements are potential gathering points and play areas for children. - Territoriality/ Natural surveillance
9. Some lifts are right Infront of the housing block which good visibility from the road as well from the upper level corridors. These lifts are the most used.
- Natural Surveillance

Following things contributes negatively to the crime and safety of Randiya Uyana

1. At the rear end of block C,E and D there is a higher ground level without much visibility. This area is full of drug dealing. People have not laid claimed to this area, probably due to the level difference from the ground level units.
- Non-Territoriality/ Natural surveillance
2. Two ends of Randiya Uyana near the rear roundabout and the front area has no boundary demarcation, fence or wall therefore people in Heenamulla freely walk into the Housing development and there are many strangers that walk through the development at ground level. - Territoriality
3. There are no streets lights for the front access road and this has made that area dangerous at night. Murder has occurred in this area. - Natural Surveillance
4. There are no shops in strategic places in ground level to enable natural surveillance in relation to the middle main path.

5. There are overflowing sewer connections at ground level that sometimes flood certain areas of the facility. This is very bad for the image and people have abandon use of such areas making them vulnerable areas for crime to occur.

- Image

6. Non availability of police or other institution in proximity to deter crime has affected the LIHRH

- proximity to other facilities

7. People from surrounding low-income communities come to the development and this increased the crime occurrences and affected the safety of residents

- proximity to other facilities

8. There were 42 cctv camaras that were removed by the residents that commit crime.

- Other

Access to roof top was blocked by gates to prevent crime in all studied case studies.

5.3 Analysis of Surveys – Solutions and pit falls to avoid

Therefore via the analysis of these LIHRH, following attributes as discussed in chapter 2 as theories, in the built form and the environment can be said to be vital in providing safety and lessening crime occurrences.

A. Territoriality –

Externally

A1. Proper demarcation of boundary and eliminate through pedestrian movement.

A2. Physical form of the building with the ground that allows territories to be defined and defended.

A2a. With nooks and corners – visibility max.

A2b. With the access road not isolating ground areas from the facility.

A2c. Without level differences between the garden area and the immediate housing units, so that ground can be defined as private.

A3. Lesser the number of units served by an entry way it is easier for residents to identify strangers in the entrance way and claim it as their entrance. Ideal number of housing units served by an entry way between 6-10 in mid risers.

A4. At ground level reduce public non claimed areas & increase territoriality of residents

A4.1 In front - give ground floor residents ownership to their immediate front to increase zones of influence

A4.2 In the Back of the block – eliminate public area by giving ground floor Resident's the ownership of the rear

A4.3 In common areas – Define and create zones for individual groups who will have claim over these. Ex. Children's play area, elder's sit out, etc.

Internally

A4.4 – Upper block connecting bridges to be eliminated.

A4.5 – Access to the roof top to be blocked.

A4.6 – To be one stack system of housing to allow for claiming the upper level inner corridors and to increase natural surveillance.

B. Natural Surveillance

Externally -

B. 1. Lifts and staircases to be located in close proximity to the access road with good visibility

B.2. Lifts and stair cases to be made as much visible as possible, if possible without lift/fire Lobbies ; but to open into an open ventilated and visible area from all levels.

B.3 Avoid wrapping the staircase behind the lift that creates blind spots.

B.4. Maximum length facing the road or the other housing blocks

B.5 Balconies or overhead corridors overlooking the surrounding and road or another housing block.

B.6 Staggered edges and protrusions to the site to enable good overlooking points and to create niches for gathering that encourages surveillance.

B.7 Windows overlooking the street and surrounding area

B.8 Big windows and balconies that enable people to hang around

B.9. No hidden corners in the access route to individual unit

B.10. parking near the house units. But avoid large areas of parking.

B.11. Playground location to be within the surveillance of housing blocks

B.12 Playground size and cross width to be within well observable distance

B.13 shops in critical places at ground level to provide surveillance

Internally –

B.14 If there are Courtyards, to be of adequate width to enable natural surveillance of corridors via other floors

B.15. Good Visibility of access corridors

B.16. Good visibility of the fire escape stairs and other areas

Both internally and externally

B.17. Good lighting – external and internal

B.18 . Coverage of areas via surveillance cameras

C. Image

C.1 Externally Vary the form of the building with architectural details finishes etc to provide uniqueness to the project.

C.2 Internally use better finishes and colors, so that it is not a standard building.

C.3 Good maintenance of garbage, sewer and water to provide a atmosphere of cleanliness and avoid litter around. Including periodic painting specially of the lift lobbies and staircases.

C.4. Avoid empty spaces

C.5. quality of Landscaping

D. Proximity to other safe places

D.1. Provide a police post with or in close proximity the LIHRH.

D.2 Police stations and other safe institutions in close proximity

D.3 Avoid locating the LIHRH next to other low income or crime ridden areas.

E. It is also important have Coordinated police patrolling and surveillance over LIHRH and Good maintenance of services such as garbage, water , sewer , lifts and electricity to avoid bad image from developing that would attract criminals to the facility.

5.4 Recommendations for the improvement of existing 3 case studies

In Muwaduru Uyana and Randeniya Uyana conditions safety and drug dealing is very high and due to lack of maintenance by the mc/uda there are problems that aggravating. This would result in these LIHRH uninhabitable in terms of safety if the prevailing conditions are allowed to continue or they will become crime dens in the Urban fabric. Therefore, rather than demolishing them in 15 years from now as other countries have done, it is better to make some immediate remedial measures to these LIHRH and thereby lessen crime and improve the safety of the residents. Following are the proposed recommendations for the case studies.

5.4a Recommendations for Muwaduru Uyana

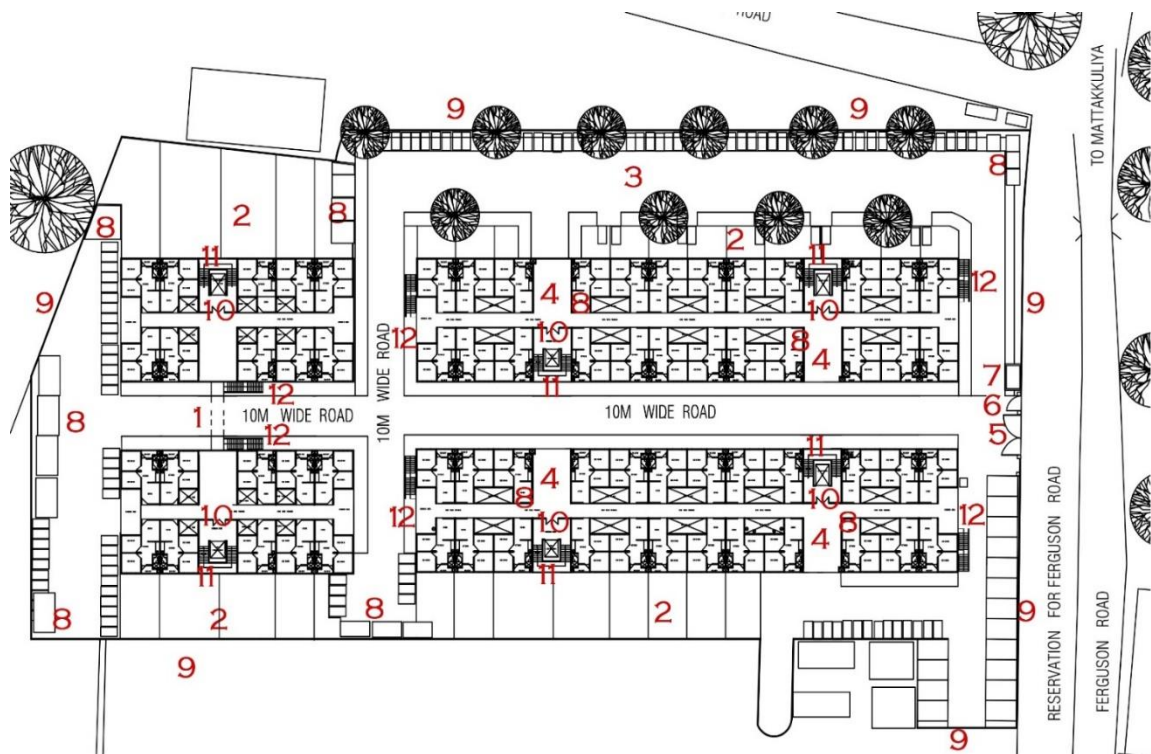


Image 5.1 – Proposed changes to built form for Muwaduru Uyana

1. Remove the upper level connecting Bridge
2. Ground level land subdivide and give to ground level residents as private gardens
3. Rerouted New 6 m road facilitating residual land to be given to house owners.
4. Remove existing houses and make the lift and stair area visible to access roads

5. New gate and gateway to improve the image and secure place from strangers.
6. Pedestrian gate
7. Security hut with police personnel on guard.
8. Shops and critical visual axis to improve natural surveillance.
9. Boundary wall right round the property to secure it from strangers.
10. Glaze fully the wall in front of the Lift lobby to increase visibility.
11. Block off the current staircase totally.
12. New external staircases with good visibility to the roads.
13. MC/UDA to attend to in upper levels sewer duct leakages.
14. Rearrest the released drug dealers/other that are at present operating in the
LIHRH
15. Reestablish a police post with adequate people inside the facility.
16. Install cctv camaras
17. Make all lifts function at all times.
18. Block A and B corridors to be artificially lit during daytime also.

5.4b. Recommendations for Sirimuthu Uyana

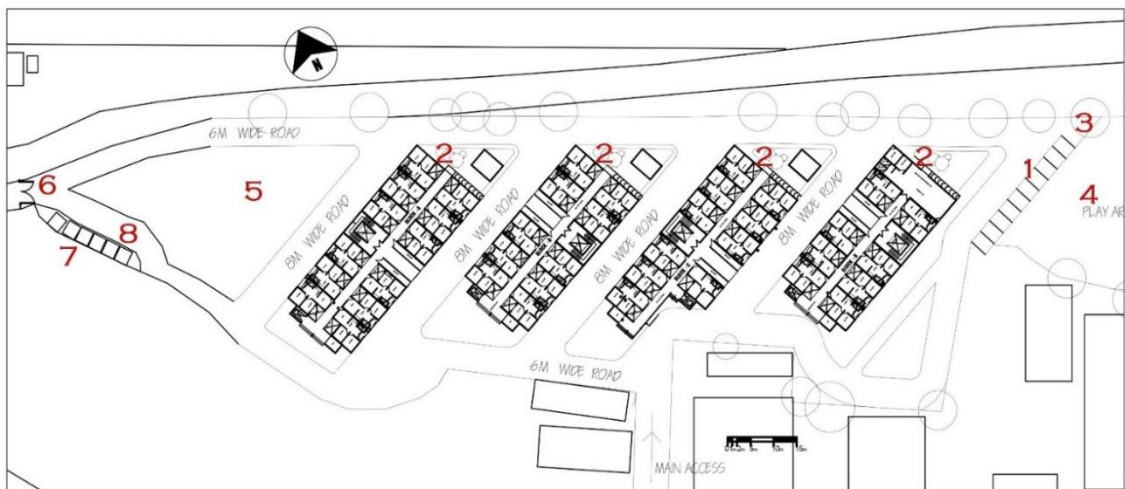


Image 5.2 – Proposed changes to built form for Sirimuthu Uyana

1. Reallocate shops to people who would run them as shops and not use them as stores
2. Make windows and balconies that has good visibility in the blank facades.
3. Close off access to the main road from here.
4. Close off the playground that has no natural surveillance
5. Proposed New playground position with good natural surveillance
6. Gate to secure the access way to main road
7. Shops and other communal activity areas to provide natural surveillance to the playground
8. Rerouted road to facilitate shops with proper visibility of the playground.

5.4c – Recommendations for Randiya Uyana



Image 5.3 – Proposed changes to the built form of Randiya Uyana

1. Gates and security post to limit access to strangers.
2. New roundabout created for outside vehicles to turn without coming to premises.
3. Secure boundary wall or fence to stop strangers coming in.
4. Higher ground area shifted back eliminating the upper unsafe path with a retaining wall.
5. Subdivided ground floor given to ground floor house owners as private gardens eliminating no man's lands.
6. Close off stair way
7. New external staircase with good visibility to the road
8. Provide big windows in the stair case right round, improving visibility.

9. Install lights for nighttime
10. Remove the existing water pumps etc. to an outside location enabling sunlight enter and improve visibility.
11. MC to stop the sewer overflow of the manholes and flooding of the roads with sewer water.
12. Reinstall the police point within the facility.
13. Install CCTV camaras.

5.5 Recommendations for future developments.

In most countries when public housing is to be designed a handbook called “CPTED” (Crime prevention through Environmental design) is issued to them that would list out guidelines to follow to prevent crime. In Sri Lanka too if UDA provides such a handbook to architects and developers of public housing, crime in LIHRH can be reduced and safety improved.

These are the proposed recommendations to adopted for future developments as discussed in 5.2. These recommendations are given in relation to 4 factors.

1.Territoriality –

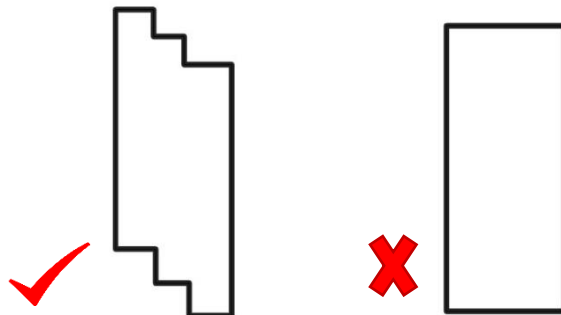
Externally

1.1. Proper demarcation of boundary to eliminate through pedestrian movement.

1.2. Physical form of the building with the ground that allows territories to be defined and defended.

A2a. With nooks and corners

Image 5.4 – Physical form response to territoriality 1



A2b. With the access road not isolating ground areas from the facility.

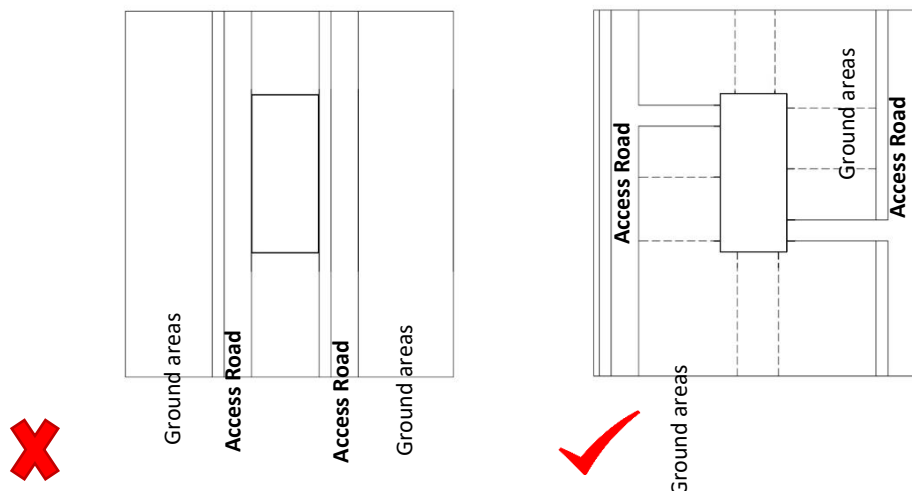
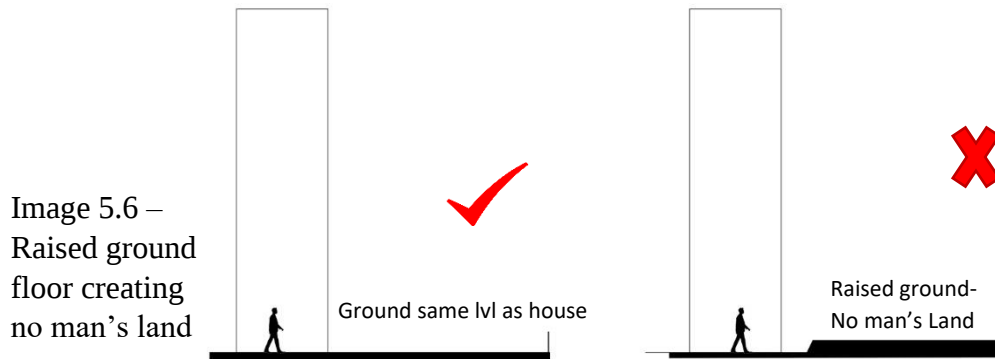
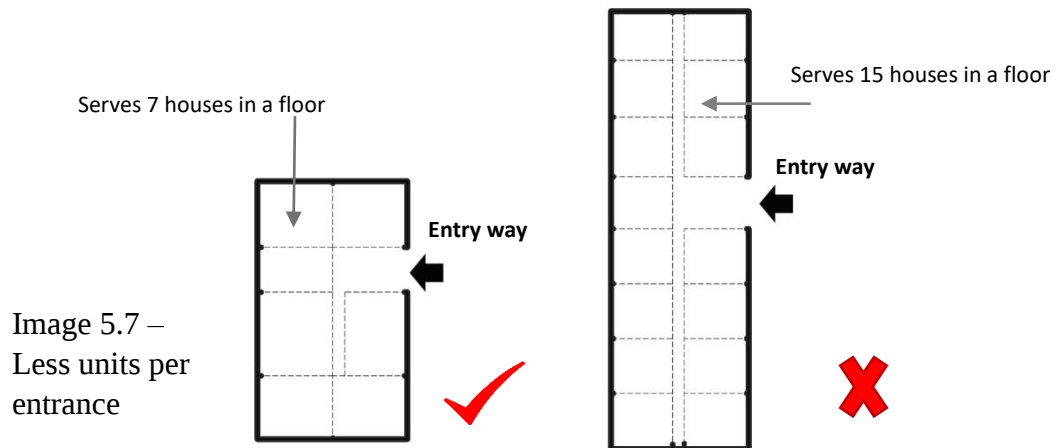


Image 5.5 – Ground floor not separated by roadways

A2c. Without level differences between the garden area and the immediate housing units , so that ground level can be defined as private.

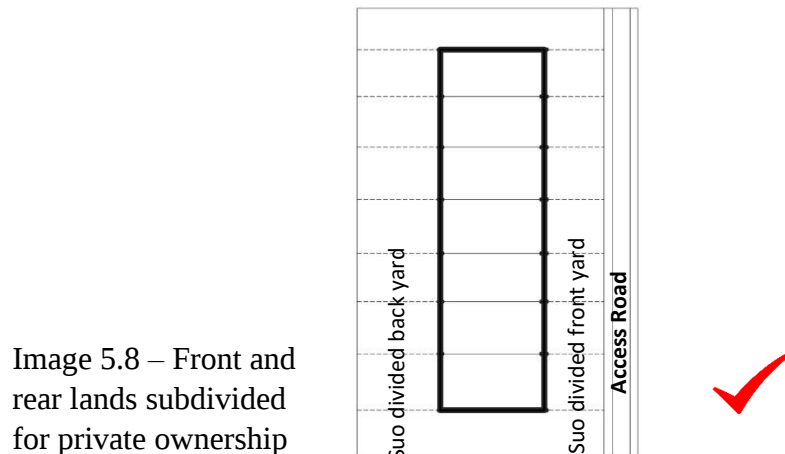


1.3. Lesser the number of units served by an entry way. It is easier for residents to identify strangers in the entrance way and claim it as their entrance. Ideal number of housing units servered by an entry way between 6-10 in mid risers.



1.4. At ground level reduce public non claimed areas & increase territoriality of residents

1.4.1 In front and back - give ground floor residents ownership to their immediate front and rear to increase zones of influence and eliminate public areas



- 1.4.2 In common areas – Define and create zones for individual groups who will have claim over these. Ex. Children’s play area, elder’s sit out , etc.

Internally

- 1.5– Upper block connecting bridges to be eliminated.

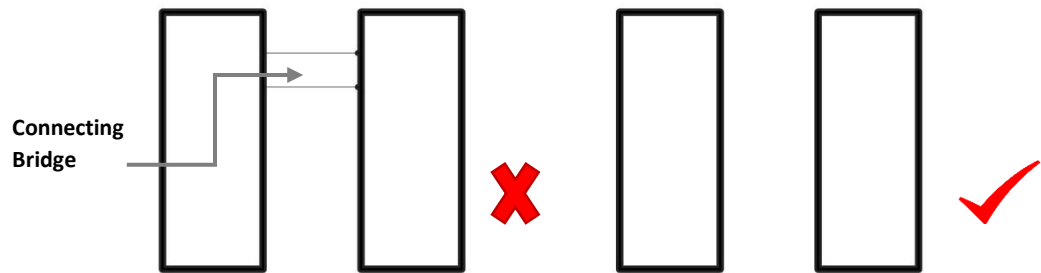


Image 5.9 – No connecting bridges

- 1.6 – Access to the roof top to be blocked.

- 1.7 – To be one stack system of housing to allow for claiming the upper level inner corridors and to increase natural surveillance.

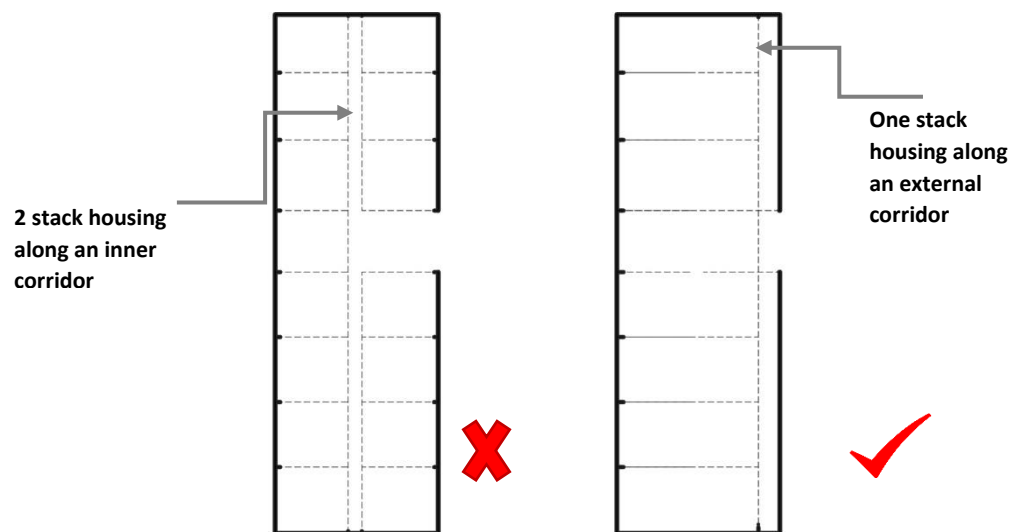


Image 5.10 – One stack and two stack housing

2. Natural Surveillance

Externally -

2. 1. Lifts and staircases to located in close proximity to the access road with good visibility

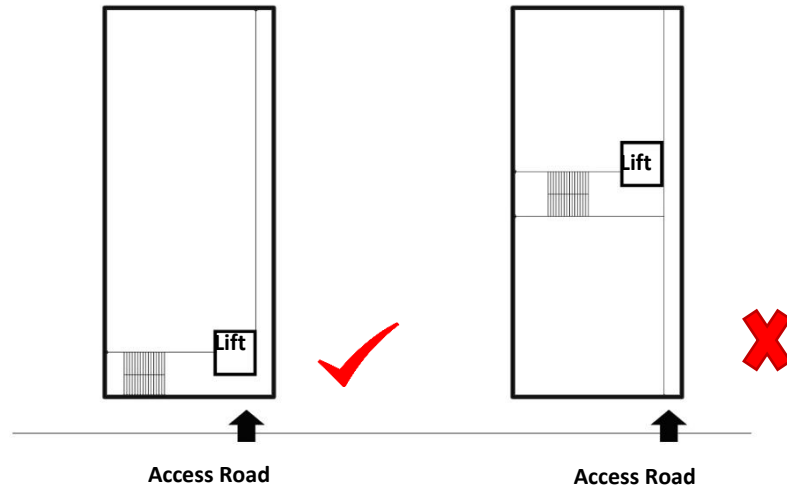


Image 5.11 – lifts and stairs close to the access road

2.2. Inside Lifts and staircases and lobbies to be made visible, if possible, without lift/fire

Lobbies; but to open into an open ventilated and visible area from all levels.

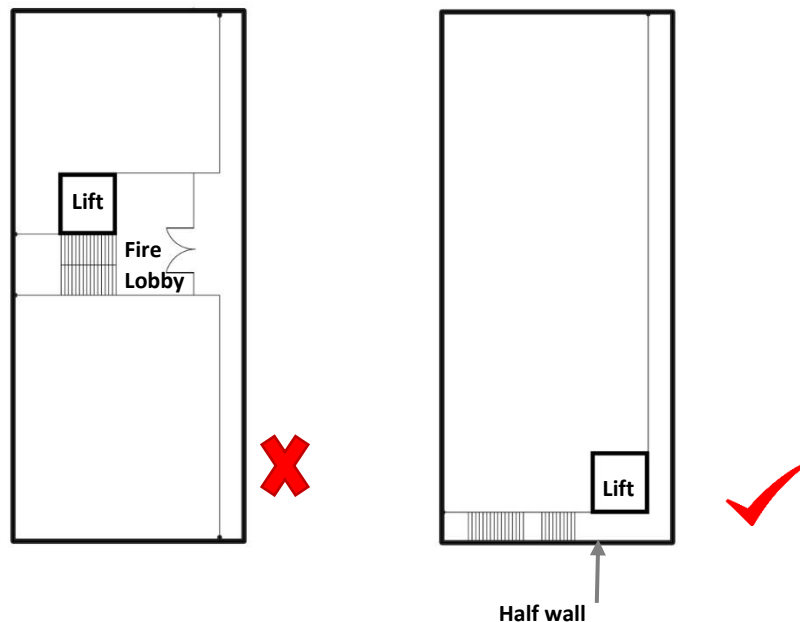


Image 5.12 – Eliminate fire lobbies

2.3 Avoid wrapping the staircase behind the lift that creates blind spots.

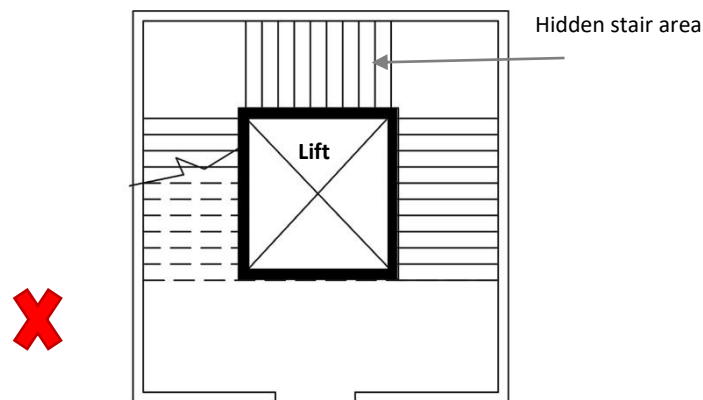


Image 5.13 –staircase hidden behind the lift.

2.4. Maximum length facing the road or the other housing blocks

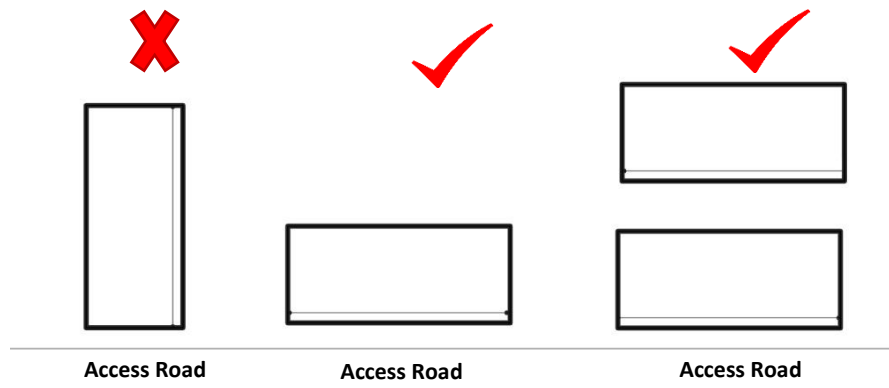


Image 5.14 – Blocks length vice faced for maximum visibility

2.5 Balconies or overhead corridors overlooking the surrounding and road or another housing block.

2.6 Staggered edges and protrusions to the site to enable good overlooking points and to create niches for gathering that encourages surveillance.



Image 5.15 – Built for cantilevers provide good lookout points.

2.7 Windows overlooking the street and surrounding area

2.8 Big windows and balconies that enable people to hang around

2.9. No hidden corners in the access route individual unit

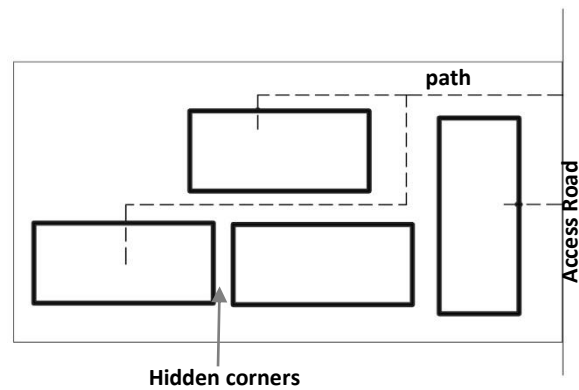


Image 5.16 – Hidden corners in the access path

2.10. parking in close proximity to the house units. But avoid large areas of parking.

2.11. Playground location to be within the surveillance of housing blocks

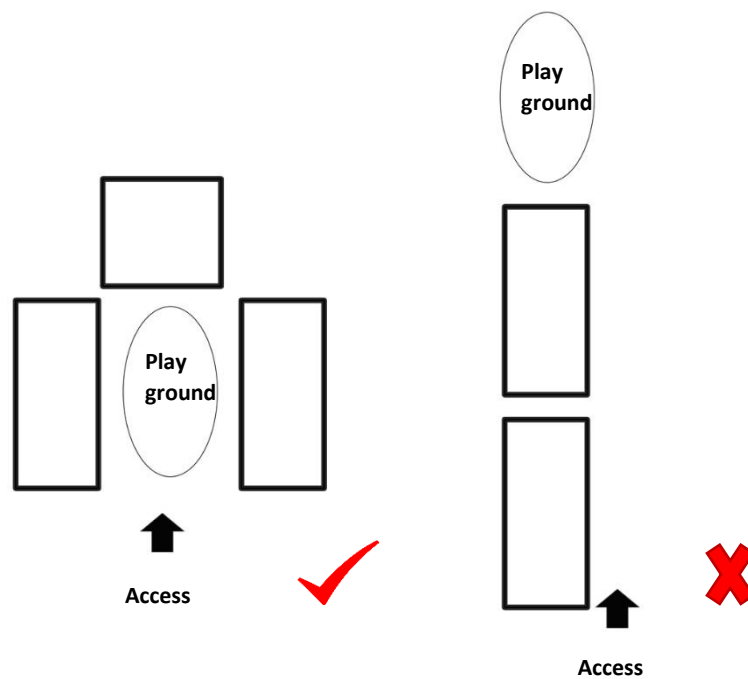


Image 5.17 – Surveillance of playground

2.11 Playground size and cross width to be within well observable distance

2.12 shops in critical places at ground level to provide surveillance

Internally –

2.13 If there are Courtyards to be of adequate width to enable natural surveillance of corridors via other floors

2.14. Good Visibility of access corridors

2.15. Good visibility of the fire escape stairs and other areas

Both internally and externally

2.17. Good lighting – external and internal

2.18 . Coverage of areas via surveillance camaras

3. Image

3.1 Externally Vary the form of the building with architectural details finishes etc. to provide uniqueness to the project.

3.2 Internally use better finishes and colors , so that it is not a standard building.

3.3 Good maintenance of garbage, sewer and water to provide a atmosphere of cleanliness and avoid litter around. Including periodic painting specially of the lift lobbies and staircases.

3.4. Avoid empty spaces

3.5. Good quality of Landscaping

4. Proximity to other safe places

- 4.1. Provide a police post with or in close proximity to the LIHRH.
- 4.2 Police stations and other safe institutions in close proximity
- 4.3 Avoid locating the LIHRH next to other low income or crime ridden areas.

Summery-

From the police data supplied by the relevant police stations and case study analysis data, that there is a relationship between built forms , environments and crime and safety was proven.

By analysis of the case studies what are theses attributes that contribute or deter crime were identified and then possible remedial measures for the three case studies and recommendations for future LIHRH are proposed under the four studied categories of Territoriality, Natural surveillance, image and proximity to safe and non safe places.

CONCLUSION

In the recent Low-income High-rise housing developments that has been constructed instances of crime occurrence and drug dealing is very high. The study revealed that there is a direct link between the physical form and environment of a housing scheme and the crime rates. It also revealed that certain physical attributes encouraged a safer environment while others created breeding grounds for crime.

Following four Physical form and environmental attributes need to be managed to reduce crime and create a safe LIHRH. These are territoriality, Natural surveillance, image and proximity to safe and non-safe places.

Increasing the territoriality of the residents via reallocations of ground floor areas and eliminating no man's lands and other related measures would reduce the crime in LIHRH.

Increasing natural surveillance of residents decreases crime and improve safety. For this to occur many improvements to the existing and future housing schemes are proposed such as protrusions to the site, one storey housing and shops in critical areas etc.

As the image of a housing development increases crime reduces and safety increases. Therefore, maintaining a clean environment, using quality materials and designing unique building forms with unique identities contributes towards this. For this to occur good cooperation of the MC and the other maintenance authorities are very important and they need to be involved in the process of crime prevention from the beginning to understand the importance appropriate maintenance.

If LIHRH is located in proximity to safe places such as police stations and other institutions the safety in the LIHRH increases while if it is located in proximity other low-income houses, prisons or abandoned warehouses and shops crime increases. The present by UDA of putting many low-income housing development is very bad in this aspect, and it is proposed that LIHRH be located in proximity to other safe areas such as police to increase the safety of them.

Finally, it is proposed that a guide book such as CPTED (Crime prevention through environmental design) that used by many countries be given by UDA to prospective housing developers that includes the findings of the study included in four categories of territoriality, Natural surveillance, image and proximity to safe and non-safe places.

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LIST OF APPENDICES

Appendix 01 – Sample Questionnaire

Development: _____ Male/Female Age : _____ Level _____ House no. _____

Sense of feeling safe

1. When coming from road to entrance of your house
 - a. At ground level I stop to talk to people
 - b. I hurry from road to elevator/stairs
 - c. I come looking at the surrounding

 2. Where do you allow your children to play
 - a. Only inside the house
 - b. Just outside the door
 - c. In the corridor
 - d. In the upper-level lobby
 - e. Outside near entrance
 - f. Outside in the play area
 - g. Other
-
3. Do you allow your child to go alone to a **shop**
 - a. In the same level
 - b. in another level
 - c. shop in the ground level
 - d. I don't allow the child to go to shops alone

 4. Do you know of instances of pick pocketing ?
 - a. You or a member of your family was pick pocketed
 - b. Your neighbors a friend of yours was pick pocketed
 - c. You have heard that pick pocketing happens
 - d. Pick pocketing does not happen here

 5. Do you know of instances of Drug dealing ?
 - a. Your family or friends were affected by this
 - b. Drug dealing happens in your floor
 - c. Drug dealing happens other floors
 - d. Drug dealing happens in the ground level outside and in the streets
 - e. Other

 6. Other violence crime such as robbery
 - a. Your family or friends were robbed
 - b. There were robberies on this floor
 - c. You have heard robberies happen in the other levels
 - d. Robberies does not happen here.

 7. Have you heard of a murder that occurred in the development? Yes/ No

8. Have you heard of a rape or sexual harassment that occurred in the facility? Yes/No
9. If rape or sexual harassment occurs in the building rate in a scale of 1 to 10



1 2 3 4 5 6 7 8 9 10 10

Territoriality

1. Do you sweep outside your door and the immediate corridor area ? Yes/ No
2. Do you sit outside in the corridor or in the balconies? Yes/ No
3. Do you keep things outside your house in the corridor or in the grounds? things like , chairs plants etc.
Yes/No
4. Are you your family members of any social group in the development? Yes/ No
5. Do you use the roof top? Yes/ No / No access to it

Natural Surveillance

6. How many neighbors you know by name ?
 - a. I know 2 families by name in my floor
 - b. I know 5- 10 families by name in the floor
 - c. I know half of the families by name in my floor
 - d. I know all of the people by name in the floor
 - e. I know 5 to 10 families by name in other floors
 - f. I know all the residents of my block by name
 - g. I don't know any one by name
7. Do you keep your front door slightly open at times to speak to neighbors or for some a family member to come in?
Yes/ no
8. Do you leave your door key or something to be given to some one in s a shop in any of the floors or ground level? Yes/ No
9. Do you leave your door key or something to be given to some one with a neighbor in your same floor?
Yes/ no

10. Do you or your family members go to ground floor outside, at any time of the day to spend time or for leisure activities ? Yes/ No

11. Do you have elderly or stay at home parents who does not go out to work or study in a regular basis ?

Yes/ No

Image

Do you know of empty houses or unused spaces in your floor ? Yes/ No

Do you know of empty houses or unused spaces in the block or the development ?
Yes/ No

Have you or your family posted photos of your block and outside the block in the social media? Yes/ No

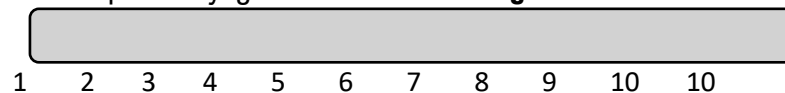
Do you see garbage and litter around the place; rate in a scale of 1 to 10



Lighting

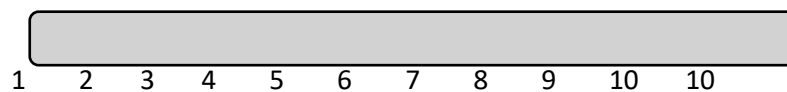
Mark from ratio of 1 to 10, 1 is the minimum 5 is normal or 10 is the maximum or very good.

a. Is there adequate daylight inside **the building**



Artificial lighting at night

b. Is there adequate light at night inside the **corridors and lobbies**



Adequateness of elevators and facilities

Mark from ratio of 1 to 10, 1 is the minimum 5 is normal or 10 is the maximum or very good.

- a. Is there adequate lifts



1 2 3 4 5 6 7 8 9 10 10

- b. In the stairs do you knock into people

- a. Yes, all the time
- b. No
- c. Sometimes at peak times

- c. Do you knock into people in the corridors ?

- d. Yes, all the time
- e. No
- f. Sometimes at peak times

- d. In the entrance lobby number of people at a time

- 1. 1 or 2
- 2. 5 to 7
- 3. 10-15
- 4. 25 – 30
- 5. 50 or more at a time

Mind maps

A . In the map provided draw areas you consider as not safe

B. In the map provided draw areas you consider as a safe neighborhood

C. Mark places in the map ,where crime has occurred; pickpocketing, robbery ,threatening, fighting, drug dealing, rape, sexual harassment, rape and murder in red pen