LIMA KEDAI VERTICAL HOUSING :
IMPLEMENTING VERTICAL SOCIAL POCKETS
TO IMPROVE INTERACTION IN SOCIAL HOUSING

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DEDICATION

This thesis is dedicated to my father, who taught me that adequate knowledge is studied for its own sake. It is also dedicated to my mother, who showed me that even the most significant endeavor could be finished if it is done one step at a time.

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ABSTRACT

For Malaysians, the most crucial necessity is a house, whether they are renting or owning one. One of Malaysia's most popular forms of housing is social housing, which connects residents to their community. People can now purchase or rent affordable or low-cost homes because of the availability of this social housing. However, the sheer number of occupants per block in high-rise living makes it impossible for social communities to establish, even when multiple designated communal areas are at the ground, podium, middle, and roof levels. Therefore, resisting temptation becomes difficult to engage in lonely activities like browsing the Internet or watching television. To encourage social interaction, people should have access to social places closer to their homes. Using existing transitional areas in high-rise living, such as the elevator lobby. This study proposes to promote social interaction by complementing already stratified social spaces with vertically-connected social hubs, which may be created cost-effectively. Furthermore, the need for sustainable development techniques is growing to distribute wealth and promote human well-being. A vital component of this approach is that communities are well-maintained and engaged in sustainable development. There will also be a wide range of issues to contend within view of the fast population expansion, particularly in metropolitan areas, where urban people will soon account for two-thirds of the world's population. One solution proposed as a new way of living in harmony with your neighbors is sustainable cohousing. Cohousing is a kind of cohabitation in which a group of individuals intend to create their neighborhood and actively participate in the design and management of that neighborhood. Using this approach, the community may select how to integrate social, economic, and environmental sustainability principles in their area. Therefore, Using case studies from Malaysia, this study examines the layouts of residential high-rises. It then proposes many design options for transforming the elevator lobby into a social place on each floor.

ABSTRAK

Di Malaysia, mempunyai tempat kediaman atau rumah merupakan suatu keperluan tidak kira kediaman itu dibeli atau disewa. Salah satu jenis perumahan yang paling popular di Malaysia ada jenis perumahan sosial yang mana perumahan ini lebih tertumpu untuk menghubungkan penduduk dengan komuniti di sesebuah tempat itu. Dengan wujudnya perumahan sosial ini, orang ramai semakin mampun untuk menyewa atau memiliki rumah dan tempat kediaman sendiri. Walau bagaimanapun, bilangan penduduk yang agak ramai dalam sesebuah perumahan sosial menjadikan ia mustahil untuk hubungan sosial antara penduduk terbentuk walaupun terdapat hanya beberapa kawasan sosial di bawah kawasan perumahan, di tengah mahupun di atas kawasan bumbung. Untuk menggalakkan aktiviti sosial, penduduk di suatu Kawasan perumahan itu harus mempunyai akses yang betul ke tempat sosial yang lebih dekat dengan kediaman sendiri. Menggunakan beberapa elemen dalam perumahan sosial yang bertingkat tinggi seperti lif lobi. Kajian ini secara keseluruhannya untuk menggalakkan interaksi sosial dengan melengkapkan ruang sosial dengan hab sosial yang cuba untuk disusun secara menegak dan mungkin diwujudkan secara kos efektif. Tambahan pula, keperluan untuk teknik pembangunan mampan semakin berkembang untuk menggalakkan kesejahteraan hidup manusia. Terdapat juga pelbagai isu yang perlu dipertikaikan terhadap kepesatan perkembangan penduduk, terutama di Kawasan metropolitan yang mana penduduk bandar akan menjadi dua pertiga daripada penduduk dunia. Salah satu penyelesaian yang dicadangkan sebagai cara baru untuk hidup secara harmoni dalam kalangan jiran tetangga adalah dengan melaksanakan car hidup 'cohousing'. 'Cohousing' ialah sebuah cara hidup Bersama yang mana sekumpulan penduduk atau individu yang berhasrat untuk mewujudkan system kejiranan mereka secara perkongsian dan ini mengambil kira sebagai cara hidup yang aktif dalam reka bentuk dan pengurusan kejiranan itu sendiri. Dengan menggunakan pendekatan ini, komuniti boleh memilih dengan cara untuk mengintegrasikan prinsip kemampanan sosial, ekonomi dan alam sekitar di kawasan mereka. Oleh itu, dengan menggunakan kajian kes dari beberapa jenis perumahan sosial dari Malaysia, kajian ini meneliti beberapa factor dalam susun atur perumahan sosial.

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CHAPTER 1

INTRODUCTION

1.1   Introduction

The urban fabric of Malaysian cities is increasingly being shaped by high-rise living. In the second quarter of 2014, there were 20,892 new launches, most of which were stratified properties rather than single-family homes (NAPIC, 2014). Each gated residential concept is designed to maximize land use, maximizing the number of units and effectively creating a confined community. Many of these communities include hundreds of members. The term "community" is no longer defined as "a body of individuals or countries having a similar history or common social, economic, and political interests," but rather as "a collection of people who happen to live in the same location" (Merriam-Webster, n.d.). It is possible for residents to socialize in residential buildings, which provide communal, shared areas on the ground, podium, and select intermediate floors, but they are insufficient. Our journeys home are planned to be as quick and efficient as possible, from the vehicle to the elevator to our front door, with a few opportunities for social contact as possible. Our society's high rate of movement only exacerbates the problem (Kneis, 2009). The formation of meaningful neighborhood social ties (NSTs)1 is hindered by a lack of opportunity to interact and motivation to seek out each other. In the absence of a social network, residents lose the ability to lean on one another for assistance. De-segregating social areas and making them more accessible and accessible to smaller groups of inhabitants are necessary. However, developers must be able to finance it in order for them to do so.
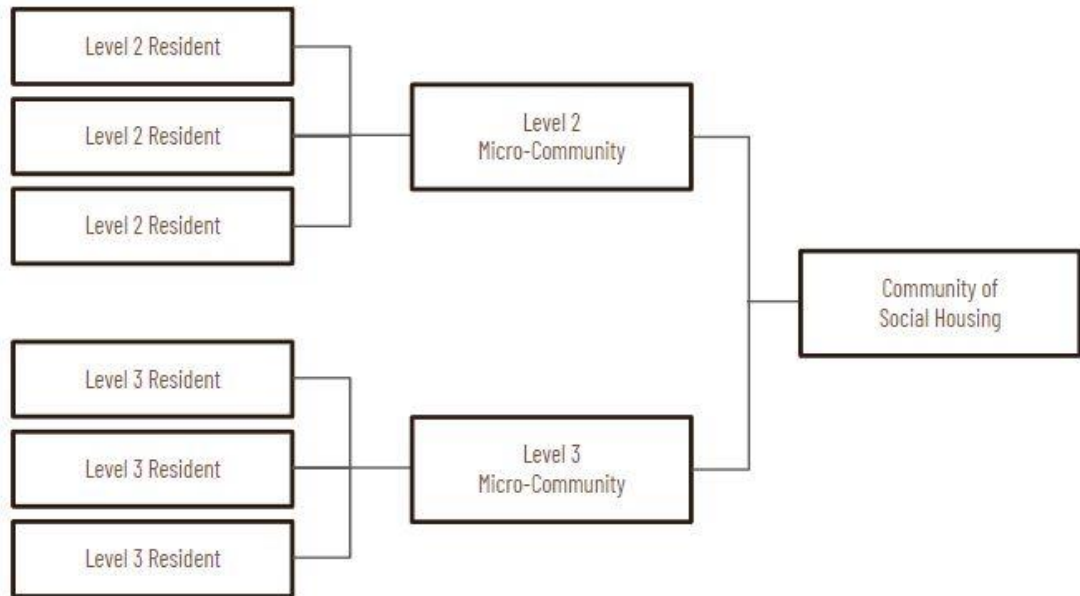
Figure 1 : A visual representation of how inhabitants' social networks may be developed and merged.

Owning a house is now a fundamental demand for Malaysians, whether they rent or buy one themselves. Housing developments that use a variety of materials and unconventional construction methods might be categorised as social housing. People with modest incomes may find homes via social housing programmes, which frequently have rent restrictions in place to keep the cost of renting low. RUMAWIP, Perumahan Awam DBKL, and PR1MA are just a few of Malaysia's various social housing options. The first time home buyer was a young generation who is going to start a new life mainly after graduating (Housing Education and Research Association, 2006). Since independence, a national housing strategy has been developed to alleviate the country's housing shortages. As a result, a closer look at affordable housing policies will help clarify the situation.

There is a solution for reducing the cost of building more the developer creating more social spaces by adopting and mixing construction method with more advanced construction system like Modular Construction System (MCS) such as industrialized building systems (IBS). This construction system can improve efficiency and decrease delivery, lowering project costs and wastage (Cheah Su Ling, Stefanie Joan Almeida, Ho Su Wei). The UK procurement efficiency initiative for social housing achieved 15% - 30% savings on material costs by using advanced construction methods

(McKinsey, 2014). In addition, the advantages of modular construction include quicker construction times, fewer deliveries, and higher quality materials since weather conditions are not a factor. Building a modular structure proved less disruptive to the day-to-day operations of the property and its residents. Fast delivery and economical modular building options are just some of the advantages of off-site construction. Permanent, temporary, or relocatable are all options for the structure. When it comes to reducing time spent on-site and cutting down on delivery times, IBS is the ideal solution. In contrast to typical systems, this is a distinct feature. IBS may be used with conventional construction methods (hybrid system) to get the best possible results (end-product).

Many individuals now choose to purchase or rent a co-living space rather than a traditional single-family home because of advances in construction technology. The term "co-living" refers to the practice of living in a shared environment with other people. Transparency is a vital component of this way of life, as is sharing information or interest. People who love living with someone who shares their interests are more likely to cohabitate than those who don't. In addition, there are financial benefits, community support, social interactions, and a sense of belonging. Sustainable living, affordability, the establishment of commons and social inclusion are the primary goals of co-living. Social creativity and architectural design are also essential aspects of the movement. Social contact, completely shared services, resident engagement, and communal living practises are the four fundamental features of co-dwelling (McCamant and Durrett, 1994). By integrating this advanced technologies system in construction with some co-living spaces style the future living spaces for people can be made into reality.

1.2 Problem Background

1.2.1 Malaysia's High-Rise, High-Density Housing

A home's potential to foster and maintain social and psychological processes may be assessed. In addition, external or environmental elements, such as the layout of the structure and its surroundings, may impact the quality of interior spaces. Therefore, High-rise residential developments in Malaysia need to explicitly identify the hierarchy of distinct spaces so that different types of public, semi-public, semi-private, and private areas may exist.

Many high-rise residential developments in Malaysia feature vast building footprints, or site coverage, unlike high-density housing complexes in Singapore or Hong Kong. Le Corbusier (1932) advocated a 12 % site coverage, while Hong Kong's best public housing plans utilize a % site coverage. However, in lower and cheap housing categories, the site coverage might be as high as 20% to 60% of the site. Building setbacks, roadways, and other infrastructure needs are confined to open-air spaces inside Malaysian high-rise developments due to the site's vast covering by concrete skyscrapers.

For the sake of profitability, developers insist that their projects' sellable area be maximized and that unproductive floor area, which includes transitional spaces between public and private sections, be minimized. This is a result of the drive to reduce costs and maximize profits. A public-private divide marks high-rise and high-density housing environments. The home's private area stops at the long, narrow semi-public hallway. With just a short, semi-private passageway between the two places, the occupants' private lives are subject to the casual inspection of onlookers, and their knowledge of this makes them reluctant to have visitors. Consider the fact that although transitional spaces are designed to speed up movement and eliminate wasted time, they may also become social hotspots owing to the potential of unexpected encounters.

Figure 2 : Transitional spaces are lacking in existing communal areas.

As a result of a lack of social areas, tenants may feel overcrowded. Residents' quality of life and community cohesiveness may be negatively impacted by overcrowding. Conditions including "lack of air," "physical discomfort," "limitation on mobility," excessive temperatures, and odors" have been reported in addition to those associated with the actual physical place itself (Freedman et al., 1971). There has been evidence that short-term crowding (experimental designs lasting only a few hours) affects feelings and disrupts performance on complex tasks (Evans, 1979). Long-term crowding can lead to lower frustration tolerance, translating into social withdrawal or aversion. (Evans, 1979) Consequently, design may be used to influence how congested an area seems.

1.2.2 Promoting Interaction with Others

As Maslow (1954) put it, "society has the potential to shape who we are since we are social beings with a strong urge to belong" (Stets et al., 2013). As adults, our behavior and emotions are influenced by the social interactions we experience as youngsters (Hazan & Shaver, 1987). Cues from society help us learn social norms, but we may choose to comply with them or deviate from them and become outsiders. Even

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if our families are the first significant social institution to impact our lives, the community in which we reside has an impact on us the minute we leave our houses.

When you live in a high-rise, your immediate neighbors are your closest and most consistent community. A thriving social network is advantageous to a neighborhood's overall well-being. With high levels of social capital, residents of a community work together to improve the lives of everyone in it. To support the defensible space idea (Newman, 1972), inhabitants create their security simply by caring about and owning the locations where they interact. Newman claims that "More than 500 individuals must share a building entrance and internal circulation space because of the high-rise elevator building. Consequently, the outer grounds and inner circulation spaces are nameless and essentially open to everyone. Having a high number of people makes it difficult for residents to recognize one other and to create similar interests and aspirations." (Newman, 1976). The form and quality of social interactions have been demonstrated to significantly impact psychological, behavioral, and physiological health and well-being (Taylor et al., 1997). There are several benefits to living in a neighborhood, including fostering a feeling of community and improving one's social well-being.

In the book 'Spirit and Place: Healing Our Environment,' Christopher Day (2002) proposed that the construction of linkages and nodes might stimulate communal activities. Osmond developed the terms 'sociofugal space' and 'sociopetal space,' respectively, to characterize the two primary types of spatial arrangements: one that pushes individuals away and one that draws them together. Several variables influence the likelihood and continuity of social contact between community members. The propinquity effect and physical beauty, likeness, reciprocal linking, and similarity are among them. High-rise living may make use of these advantages. Instead, this study aims to support several "blanket" variables that favor social contact, such as proximity.

As Festinger (1950) explained, the propinquity effect is based on the simple exposure effect, which shows that a person's likelihood of developing a special bond rises with the frequency they contact other people. Festinger's research is especially intriguing since it correlated the closeness of neighbors and the proximity of units, and

the ways of vertical circulation to residents' friendships. When it comes to improving social interaction, three factors have been identified by Fleming et al. (1985). -

i. There are several ways to get in touch.

ii. The proximity of flats.

iii. The availability of venues to meet and socialize.

1.2.3 Current Malaysian Housing Policies and Their Effects on Residents' Social Interaction

For residential constructions, the provision of open spaces ('Kawasan lapang' in Malay) is already mandatory, ranging from 10% to 15% of the land area, according to the state's Local Plan. However, the Town and Country Planning Department of Peninsular Malaysia (Jabatan Perancangan Bandar dan Desa, JPBD) stipulates only basic amenities such as kindergartens, prayer rooms, and multi-purpose halls in its Draft Planning Guidelines for Common Facilities (2011).

Such high densities should be utilized sparingly and with care, of course. In the past, settlements had a lower population density but were more widely dispersed. Residential life in high-rise buildings is the opposite, particularly in high-density ones. A large concentration of inhabitants in a single location may hinder the establishment of communities. Numerous studies, such as those done by McCarthy et al. (1978), Baum et al. (1979), and Evans et al. (2000), demonstrate the adverse effects of social withdrawal1 caused by living in high-density environments. In addition, residents in high-rises might become targets for a crime if they do not know who their next-door neighbors are (Conklin, 1971).

1.2.4 Mixing the construction technique in social housing scheme

Modular construction systems and other cutting-edge building techniques must be included in the design. In the same way that building costs can be decreased and the

price of the house can be made more accessible, this can also be done. People in large cities like Johor Bahru may save money on housing costs by using co-living places. An urban lifestyle for the next generation may be made more accessible by using this method. The conventional building technique of cheap housing in Malaysia prevents mass customisation from being used to construct a communal dwelling. Using PR1MA housing as an example, the federal government sought to employ modular construction to provide low-cost housing (Salmiah Aziz, 2015). As a result of a lack of knowledge about this technology, the traditional system is still utilised to create this dwelling, and as a result, the construction time and cost cannot be decreased. On-site installation is the key benefit of modular construction. The modular building takes less time on-site, fewer deliveries, and better quality materials than traditional construction, all advantages. To put it another way: in terms of the manufacturing industry. The structure might be permanent, temporary, or portable. That's a departure from the norm. To maximise the building's performance, modular construction may be coupled with traditional construction methods. Finally, the manufacturing process improves the building's efficiency and precision. In terms of structural strength, modular structures outperform conventional ones. It is preferable to use modular systems since each design is built independently of the others. Ensure that they can be elevated to their foundations and that they can withstand the rigours of shipping. Using a sophisticated modular building technique will be much easier to develop sustainable communal housing than before.

In Malaysia, IBS was first adopted to boost systemic building procedures and reduce the number of foreign workers employed. – However, there have been several reports of obstacles to reaching this aim in the literature. For example, according to Hamid et al. (2008), supply and demand, economic volume, general preparedness, and social acceptance were essential obstacles. Basic IBS concepts such as modular coordination and volumetric and non-volumetric construction approaches were not understood by experts, according to Badir et al. (2002). Many academics agreed with this conclusion (Gibb, 1999; Davidson, 1990; Benros and Duarte, 2009). It was suggested that future modifications to manufactured building components were not conceivable since they resulted in a lack of flexibility in the construction phase. Furthermore, according to Hassim and Lessing (2005), the IBS method hindered the establishment of an end-user-focused design. There was insufficient coordination when integrating spatial

arrangement and the dimensions of components into the overall design of spatial and functional space linkages (Gibb, 2001). Local weather conditions have a significant impact on the transportation of construction components. There are several considerations to keep in mind while designing components for transport. Other important issues include incompatible interfaces between manufacturers, lack of cooperation between manufacturers and architects during the design process, restricted uses of building materials (i.e., mainly employing concrete for precast beams and columns, and panelized wall systems) (Thanoon et al., 2003). The author's Tam et al. (2007) proposed using a lean construction technique to create more uniformly high-quality goods. On the other hand, the resulting building flaws were challenging to disguise and might lead to structural collapses and water leaks. All of these obstacles limit IBS's ability to innovate in the field of architecture, resulting in bland structures devoid of character. Additionally, IBS should be able to construct systems that can seamlessly incorporate building components into a room's overall design. It is also feasible to create diverse and efficient designs if you apply system thinking to architectural design early (Gann and Senker, 1993). According to current standards, the manufacturing and assembly methods are used only after the design phase has been finished (Walch, 2001).

In Malaysia's housing market, conventional construction methods have been used in the past (IEM, 2003). Thus, Malaysia's CIDB has supported IBS technology so that prefabricated building components may be used to their fullest extent in the building sector. The fact that IBS integrates mass production manufacturing and construction processes, where building components are prefabricated, to optimise the majority of on-site construction activities and artistry, reduce waste, shorten construction time, and lower project costs have been documented by Junid (1986); Padrid (1997); Trikha (1999); Lessing et al. (2005) and Tam et al. (2007). IBS has technical advantages for the construction sector since it primarily supports standard buildings rather than unique ones. Studies have not examined how IBS may be used in architectural design to suit current design changes, such as "form flexibility," to satisfy current design trends (Howes, 2002). Architects, on the other hand, have no idea how to incorporate IBS components into their designs. Due to the absence of a central repository for IBS data and architects' lack of familiarity with IBS, many design flaws have been discovered during construction documentation, which has caused further delays (Kamar et al.,

2009). As a result of these factors, the IBS approach has a negative perception among architects and customers: it restricts flexibility; it only allows internal flexibility in the layout; it creates jointing problems; it promotes monotonously manufactured building components; it creates repetition in standardised building components, and it does not allow varied forms that can yield creative architectural designs. Despite these flaws, current IBS building processes need to be rejuvenated in the minds of designers so that they may more effectively include "system thinking" into the architectural design process. Architects, for example, are generally constrained by a systematic approach to design.

Finally, a typical low-cost house design developed in a small structure might cause sick building syndrome impact. Non-specific symptoms such as eye, nose or throat irritation, skin difficulties, headaches and nausea are all examples of the sick building syndrome defined by the World Health Organization (WHO). (World Health Organization, 2002) Sick building syndrome may be caused by various causes, including the structure of the building and the materials used to complete it. Low ceilings, no windows, and closeness to neighbouring buildings contribute to inadequate ventilation in low-cost housing. This is a common problem in most low-cost housing across the globe. Many studies have shown that a person's housing condition is a crucial determinant of their overall health and mental well-being (Navarro et al., 2010). It has had a significant impact on poor respiratory health and a surge in infectious infections, which puts people at greater risk of life-threatening diseases (Chaudhuri, 2004). (Baker et al., 2000).

1.3   Research Aim

This thesis aims to propose social housing in Lima Kedai, Johor Bahru by adopting advanced building technology such as Industrialised Building System that integrates with the co-living spaces lifestyle to increase social interaction within the vertical housing.

**1.4	Research Objectives**

1.1.1	To improve a vertical housing scheme and space configuration for enhancing the social needs.

1.1.2	To create micro-communities comprising the residents by injecting the co-living style in social housing in Malaysia.

1.1.3	To design a social housing by implementing or mixing the construction method to lower the cost of construction for social housing scheme.

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