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Micro-Housing as an Alternative Solution Housing Solution to the Big City

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Malaysia's federal capital, Kuala Lumpur, is the country's most populated and biggest metropolis. The city, on the other hand, becomes a ghost town at night, when the city's working population retires to the suburbs. Micro-housing may be an option for addressing this problem. This research tries to identify how micro-housing may be implemented in Kuala Lumpur by looking at micro-housing antecedents in places like New York and Seoul, as well as interviewing the design team behind the Kuala Lumpur micro-housing design concept "Micro-Village."

Keywords: Micro-Housing, Alternative Solution, Big City

1. INTRODUCTION

While 54,000 people work in the city centre, only 9% of them reside there, with the remaining 91 percent returning to their homes in the suburbs after work, according to Think City, an urban regeneration group. After dusk, the city becomes a ghost town, making it a hazardous and unwelcoming place to visit. This might be due to the fact that property prices in the city centre are higher than those in the outskirts. The M40 income group accounts for the bulk of the city's workforce, with a median monthly salary of RM6,275. As a result, there is a pressing demand for affordable housing in the city core.The focus is to reintroduce these individuals inside the city so that they can make a livelihood closer to their place of employment rather than returning to the suburbs. They may be able to contribute to a more secure, ecologically friendly, and long-term environment by doing so. At the same time, a new community made up of the city's employees and young urbanites may emerge in the city centre.

1.1 Micro-Housing as an Architectural Solution

Micro-housing is one conceivable architectural option. Residential units that are smaller than traditional-sized apartments are referred to as micro-housing. The idea of micro-housing is to eliminate any extra places that aren't necessary for a person's everyday needs. These flats generally range in size from 300 to 500 square feet and include bathrooms and kitchens. A community area and some facilities may be shared by some of these units. Although common areas like dining rooms and kitchens are shared amongst apartments, each unit has its own private domain, such as the bedroom.

2.0 LITERATURE REVIEW

2.1 Micro-Housing Definitions

Micro-housing is a relatively new housing typology. Therefore, its objective definition is still vague. Various authors have established their own definitions of “micro-housing.” One author state that on average, a micro-housing unit has a floor area of300sqft (Infranca, 2014). Another author defines micro-housing as an energy-efficient house strategically designed to maximize usable space and minimize ecological footprint (Iglesias, 2014). The author also states that micro-housing can be comparedwith current available housing forms, such as boarding houses, single room occupancy units (SROs), mobile homes, and studio apartments.

Although there is no standard definition of micro-housing, it eventually boils down to one definition; a housing unit that is relatively a lot smaller than current housing standards. The floor area of the housing unit is the determining factor

in establishing whether the housing unit is a micro-home or not. This observation is supported by various research by Steeves, Iglesias (2014), and the Urban Land Institute (2014). One author note that micro-housing had already existed even before the term itself had been used (Steeves, 2014). One example would be the Single Room Occupancy units or SROs in the United States. Other similar works include Kisho Kurokawa's Nakagin Capsule Tower in Tokyo.

Micro-housing is more prevalent in rental form. It can be developed as a medium- to high-rise condominium and rented out to the public by the owner. Micro- housing is typically located in urban cities with large populations such as New York, Seattle, San Francisco, and Boston (Mooney and Kilpatrick, 2013). Micro-housing is more suitable for young professionals aged 20-30 years old who seek for a living in big cities.

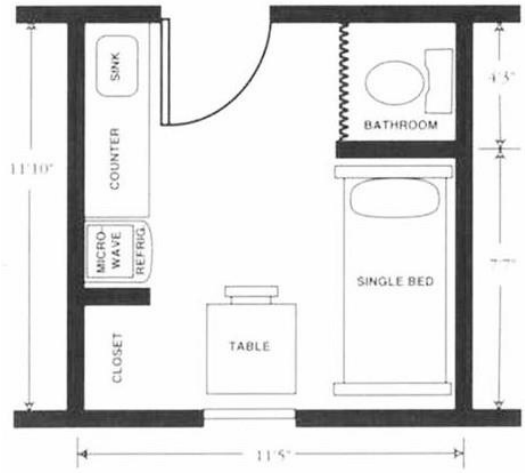

Figure 1: Single Room Occupancy unit found in the United States

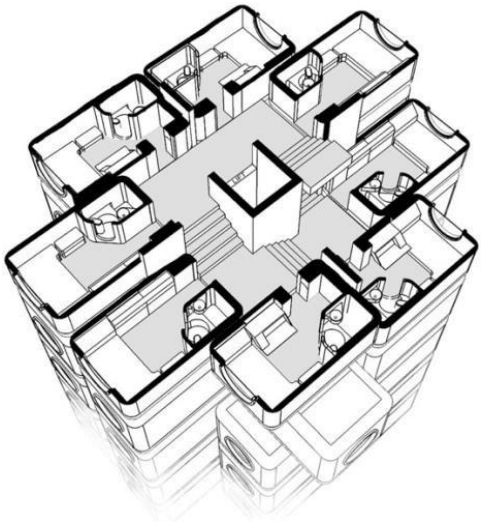

Figure 2: Kisho Kurokawa's Capsule Tower Hotel in Tokyo

2.2 Spatial Characteristics of Micro-Housing

There is no doubt that micro-housing units are small. The floor area is reduced down to the minimum area required for human ergonomics and anthropometrics to work (Iglesias, 2014). However, where a micro-housing unit typically lacks in horizontal space, it is made up for by utilizing vertical space. Such is done by incorporating vertical storage, arranging spatial functions vertically, or by having interchangeable orconvertible furniture.

Figure 3: Maximizing use of vertical space in a micro-apartment in San Francisco

Figure 4: Addition of foldable bed

Figure 5: Staircase that doubles as storage space

2.3 Minimum Liveable Space

The size of living space is shaped by culture (Steeves, 2014). To further explain this,Steeves uses two main metrics as a means of measure. The first is by establishing the average square

footage per capita. The second method is by identifying averagehouse size.

Australia ranks first at 960 square feet per capita, followed by the United Statesat 832 square feet per capita and Canada at 779 square feet per capita. On the other end of the spectrum, the United Kingdom has 356 square feet per capita, followed byChina at 215 square feet per capita and Hong Kong at 161 square feet per capita. In terms of average house size, the rankings correspond with the average square feet per capita. Australia ranks first with an average house size of 2303 square feet while Hong Kong ranks last with 484 square feet.

However, if a micro-housing unit only has a floor area of 300 square feet as stated by Infranca (2014), it would fall even below Hong Kong's standards. It is worthnoting that Hong Kong is one of the densest cities in the world, where its housingconditions scarcely consider quality of living (Chan, Tang, and Wong, 2002). Nevertheless, whether 300 square feet or a 500 square feet unit is considered as micro-housing is still vague, as this form of housing is still relatively new, therefore it is unclear where the range starts and ends (Kurutz, 2014).

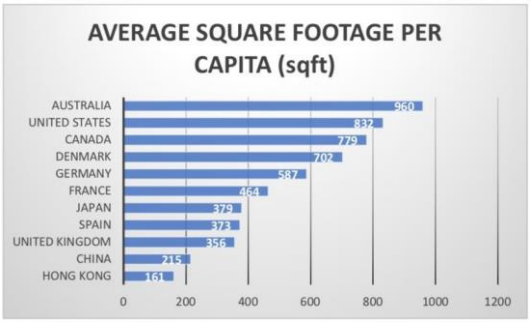

Figure 6: Average square footage per capita in various countries
Source: Wilson, L. How Big is a House?

Figure 7: Average house sizes globally
Source: Wilson, L. How Big is a House?

3. METHODOLOGY

This study will look at how micro-housing is implemented in cities throughout the world, as well as examine and analyse Kuala Lumpur's present approach to micro-housing. Data is gathered through historical research, which includes reading papers, journals, electronic sources, and images, in order to meet the research objectives. Interviews using semi-structured questions are also used to acquire data.

4. RESULT AND DISCUSSION

This section discusses the findings on micro-housing apartments in New York and Seoul. These two cities were chosen due to their location as urban cities, similar to Kuala Lumpur. This section also reviews the current design approach to micro-housingin Kuala Lumpur.

4.1 Carmel Place in New York

Carmel Place is a 9-storey micro-apartment located in Manhattan, New York. It was designed by architecture firm ARCHITECTS as part of New York's former mayor Michael Bloomberg's initiative to provide affordable housing for the city. It comprises of 55 units ranging from 274-360 square feet each. 40 percent of the units are sold as affordable housing units priced below market rates. Each unit is designed to achieve a sense of comfort, spaciousness and efficiency. This is done by raising the ceiling height to 9 feet and 8 inches (2.9) meters, incorporating vertical storage, and adding Juliette balconies with tall sliding windows.

Figure 8: Smallest unit (273sqft) at Carmel Place

Figure 9: Largest unit (360sqft) at Carmel Place

Carmel Place provides its own public and private facilities for its residents. Its private facilities complete the basic necessities of its residents while the public facilities allow the residents to interact with one another. The public facilities include a community room, study room, laundry, tenant storage, bike storage, retail space,

a sky terrace, and a fitness center. Private facilities include a personal kitchenette, private bathroom, closet, and a foldable bed.

Carmel Place was fully erected within 4 weeks. This was made possible by using modular pre-fabrication construction that was pre-fabricated at the Capsys factory in the Brooklyn Navy Yard, while the foundation and ground floor were built onsite. After fabrication, the modules were transported to the site and then "stacked" on top of one another. The building does not have any columns and beams as the modules are structurally independent of one another.

4.2 Songpa Micro-housing, Seoul

The Songpa Micro-housing, also named Tapioca Space, consists of 14 micro-units specifically arranged to to create a variety of public, semi-public, semi-private, and private spaces that can be occupied to according one's own needs. It was designed by architects Jinhee Park and John Hong of SsD Architects. Each unit is only 120sqft in size, which is extremely small in comparison to Carmel Place's micro-units.

Songpa Micro-housing's design was derived from the concept of tapioca pearls. The Tapioca Space, like the ambiguous gel around a tapioca pearl, is an intersection between public/private and interior/exterior (Park and Hong, 2014). Each unit is independent and does not share a party wall. This allows for extra space between each unit. These spaces are then used as an extension of the unit themselves, applying visual and physical connections from one space to another.

Figure 10: Second floor plan of Tapioca Space

The basic micro-unit is compact but contains the essential needs such as a resting area, kitchenette, and private bathroom. Public facilities include an outdoor gym, an exhibition space, a micro-auditorium, and a café. These spaces are located on the basement, ground floor, and second floor, creating a shared "living room" for the residents. Unlike Carmel Place, Tapioca Space was built using a simple post-and-beam construction where its main structures are steel. The micro-units are then slotted intothe cavities of the structure.

4.3 Current Micro-housing Design Approach in Kuala Lumpur

In February 2018, UNHabitat's 9th World Urban Forum took place in Kuala Lumpur. City-making organization ThinkCity together with DBKL took this as an opportunity tohost a micro-housing exhibition, called the Micro Village, at Medan Pasar, Kuala Lumpur. The exhibition was used as a social experiment to garner the public's reaction on micro-housing.

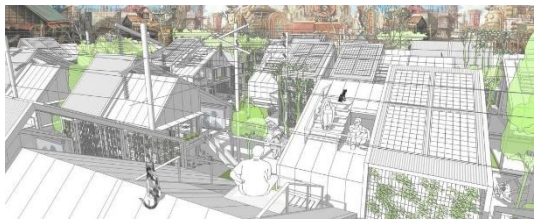

Figure 11: Artist's impression on the Micro Village
Source: Tetawowe Atelier, 2018

The design team behind the micro-village is from Tetawowe Atelier. Based on an interview with Andrew Leng, one of the design personnel, they approached this designby utilizing a 2.5m x 5m grid, which is the size of one carpark bay. In that sense, the design occupies two carpark bays (2.5m x 5m x 2nos). The main idea is to convert existing open-air carparks scattered throughout Kuala Lumpur. Driveways can be used can be used as green belts and/or bike lanes. Any unused carpark bay betweeneach house can be utilized as planting beds or simply as a communal area for the residents. In time, these components will make up an urban micro village.

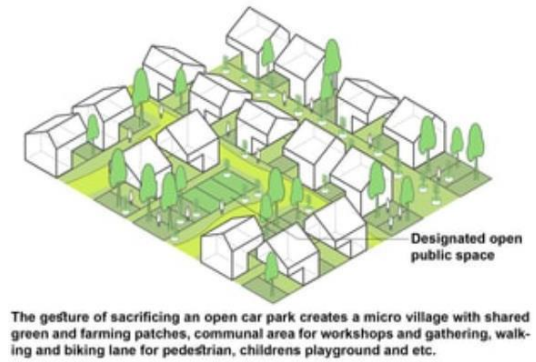

Figure 12: Complete micro-village
Source:Tetawowe Atelier

One micro-unit has a floor area of 264sqft, which is slightly smaller than Carmel Place's units and larger than Tapioca Space's units. An open plan kitchen with laundry facilities is located on the ground floor. This open plan acts as dining area that can double as a casual, impromptu meeting area. It can also be used for a micro-business, such as running a mini bookshop or a food stall. An

upper mezzanine floor contains the private living space and a sleeping deck accessible via a steep stairway that doubles as storage space.

The design team incorporated some design strategies to make the micro-house feel more spacious. The kitchen and dining space on the ground level are semi- outdoor. Full-height windows are used on the upper floor and there is also a double- volume void above the kitchen. The combination of all these elements contribute to natural ventilation and plenty of natural daylight to enter the micro-house.

When the micro-houses are placed together, its highly adaptable ground floor plan encourages the formation of flexible semi-public space. The main idea is to fostercommunal living amongst the residents. This scheme gets its merits from the way theground floor as much ambiguity, blurring the lines between public and private realms, contributing to the idea of communal living.

In terms of construction, the micro-unit was pre-fabricated at Kongsi KL. It was constructed into 4 modules that allow for easy transportation. Once completed, the modules were transported to Medan Pasar to be assembled.

5. CONCLUSION

Micro-housing has the potential to become a platform of establishing new communities of the same like-mindedness. But micro-housing alone cannot solve the problem of housing affordability on a large scale. It can only act as an alternative to housing in the city that could appeal to the younger working generation, especially for one- to two-person households. These small households can move out of their rented 3- bedroom apartments and into the micro-house. As a result, the vacated apartments with more than 1 bedroom can then cater to the families and households that need it the most.

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