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Bottom-Up Initiatives in Hong Kong Grassroot Dwellings

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Abstract: In Hong Kong, the rigorous mass housing (MH) effort has yet to resolve increasing housing demand. In 2018, the government pledged to increase public housing supply over the next decade. Regardless, experts concern that affordable home shortfall remains expected. In search of affordable dwelling, bottom-up initiatives rise against the centralized housing approach. Policies and physical conditions regulate these initiatives at various levels. Freedom for autonomous action is scant. Nonetheless, these initiatives question the role of architecture concerning: 1) the empowerment of inhabitant's self-built capacity; 2) the realization of diversified lifestyles; and 3) the restoration of the intimate relationship between dweller and the built environment. This paper investigates three subdivided unit (SDU) households in Kowloon District. The objective is to identify the common pattern shared among these families, explicitly concerning how these occupants adapt to the units. The study comprises of two themes: first, the spatial organization within the subdivided area; second, the furniture function in support of programme needs. With a focus on reinvestigating the architects' role, the research aims to outline principles to appropriate self-built action of the grassroot community.

Key words: self-built architecture, grassroot dwelling, housing value, dweller's control, bottom-up approach

1. Introduction

Dwelling is a process involving both inhabitant and daily activity. The notion of intimacy between human and dwelling is suggested from the original form for the word *dwell* as Greek *Homois* — meaning "of the same kind [1]. Bachelard perceives the built environment as a cradle to mediate between self and the world [2]. In *Supports*, Habraken further depicts the connection as the most important "natural relationship" for human existence [3].

After WWII, government and public sectors became increasingly responsible for private matters, including health, safety, welfare, and property values of the individuals [4]. The new social attitude, as a result, introduced centralization into the housing process.

Professional institutions make standardized decisions on design, production, management, and maintenance procedures. The built environment, rather than embodying individuality of the people, unifies collective control of the authority.

By the late 1950s, destructive effects of the "top-down" intervention surfaced: elimination of occupant participation, loss of individual freedom, coarsening of the urban fabric, and obsolescence of housing stock [4]. Nonetheless, with the escalation of technological advancement, industrialization, and economic development, MH remains dominant in contemporary society.

2. Housing Crisis in Hong Kong

Demand for public sector homes in Hong Kong has been keen. In 2018, the government promised to increase public sector home supply by over 10%. The public-private housing supply ratio adjusted to 70:30, from 60:40 [5]. Despite the significant policy change in favor of affordable home supply, Hong Kong's public housing shortfall remains expected [6].

The average waiting time for public housing has increased to 5.4 years — from the mark of 3 years [7].

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Grassroot population who cannot afford private property must seek bottom-up alternatives — rooftop house, subdivided unit, cage room, and coffin cubicle.

3. The Bottom-Up Housing Typology

These housing typologies dates back to the Treaty of Nanking signed by the end of the Opium War. In 1841, the British government designated the City of Victoria as the *de facton*capital of Hong Kong. Victoria Peak, in consequence, became the primary settlement area for Chinese and refugee.

Tenement houses were one of the most dominant dwelling options. It was a two-to-four-story building, comprising retail and residence. With less than 50 square meters per floor, a tenement house accommodated more than 200 people.

Each tenure further subdivided into smaller units to maximize rental profit. Similar to today's cage room and coffin cubicle, the smallest tenure was a bed of a bunk bed enclosed with metallic nets. Another affordable alternative was squatter hut built by metal sheets, used timber, broken bricks, and garbage [8]. In this paper, the research examines further the subdivided unit and how its dweller accustoms to the given spatial condition.

4. The Subdivided Unit in Hong Kong

In 2016, there were about 92,700 SDUs in more than 27,000 quarters in Hong Kong. Over 200,000 people (91,800 households) were accommodated [9]. The median monthly income of the working population living in SDU was $9,250, more than 30% of which spent on rents.

The economic burden of the SDU tenants often did not barter for fair living conditions. As regards the living area, over 65% of SDU households were living in 7-13 square meters floor area, with a median per capita being 5.3 square meters. Facilities such as independent toilet and kitchen were only installed in 95.9% and 72.4% of units respectively.

According to the Right to Adequate Housing, UN-Habitat underlines six key aspects for adequate living standards: security of tenure, availability of services, materials, facilities and infrastructure, affordability, habitability, accessibility, location, and cultural adequacy [10]. Clearly, most of the subdivided units in Hong Kong are not in compliance with these standards.

5. The Subdivided Unit Condition

Research on physical and social constraints is fundamental for further analysis. Based on the idea of "level" in the built environment [11], the study identifies the SDU conditions in three categories (fixed, soft, and self conditions).

5.1 Fixed Conditions

The fixed conditions are the fundamental features in the built environment. Based on Habraken's physical structure, the identified elements categorize into five levels (i.e., urban, tissue, building, unit, and furniture) [11]. The order of levels denotes a hierarchical relationship. Changes in the higher levels affect the lower ones. As a result, a high-level environment determines the degree of freedom in the lower level.

An urban level describes the large-scale city fabric. It includes roads and infrastructure, public transport, district boundaries and programs, and major public facilities.

A tissue level underlines the critical elements on a neighborhood scale. It comprises local roads, local transport, public facilities, and building zones and programs, all of which are essential to determine the quality of an external setting.

A building level emphasizes the physicality of space between the neighborhood and the unit. It defines the means of transportation, the social quality among neighbors, and the usage of the common area.

A unit level specifies all tangible features within the subdivided living space, including wall/partition,

layout, door, window, finishing, bathroom, kitchen, switch/socket, and ventilation.

Lastly, the furniture level includes loose items inside the unit.

5.2 Soft Conditions

The soft conditions are the unspoken rules established on trust, common norms, and personnel networks. As the name suggests, these conditions indicate a certain degree of compliance flexibility. The main contributors are the critical personnel whom the tenant contacts occasionally. They include the management office, tenure owner, neighbor, friends, and relatives.

5.3 Self Conditions

The self conditions are the tenants' social and financial circumstances, including household structure, ethnic and cultural background, economic status, and living habits. Unlike the fixed and soft conditions, these are the personal rationales for utilizing the space inside the unit.

6. Case Study

This paper examines three SDUs in Kowloon District. The selected tenants are all single-parent families, where mothers are the primary source of income, and children are at school. The objective is to identify the common pattern shared among these families, explicitly concerning how these occupants adapt to the units. The study comprises of two themes: first, the spatial organization within the subdivided area; second, the furniture function in support of programme needs. With a focus on investigating architecture's role, the research aims to outline principles to appropriate self-built action of the grassroot community.

6.1 Case Study One

The first case is the Leung family — a working mother, a 7-year-old son, and a 9-year-old daughter. Located in an early-60s residential building in Tai Kok Tsui, the unit is one of the four units subdivided from a single flat (Fig. 1). The location is rather convenient. Markets, shops, schools, and other services are within a 5-to-10-minute walk.

The unit is a studio flat of about 11 square meters (Fig. 2). It encompasses one individual bathroom, with no kitchen provided. Windows mainly occupy the wall opposite of the entrance. The living space is at the center where dining occasionally takes place. Right next to the entrance, there is the cooking area on top of the washing machine. The bunk bed is at the recessed corner next to the toilet. The rest is storage space. Each furniture supports multiple uses (Table 1). The bed, apart from sleeping, is also for sitting, dining, studying, and storage. The folding table provides a dining area for visitors and additional study space. The chair (depends on whether it is foldable or not) offers seating and storage. The kitchen countertop for cooking becomes a storage area, during times other than food preparation.

Fig. 1 Panoramic view of case study one interior.

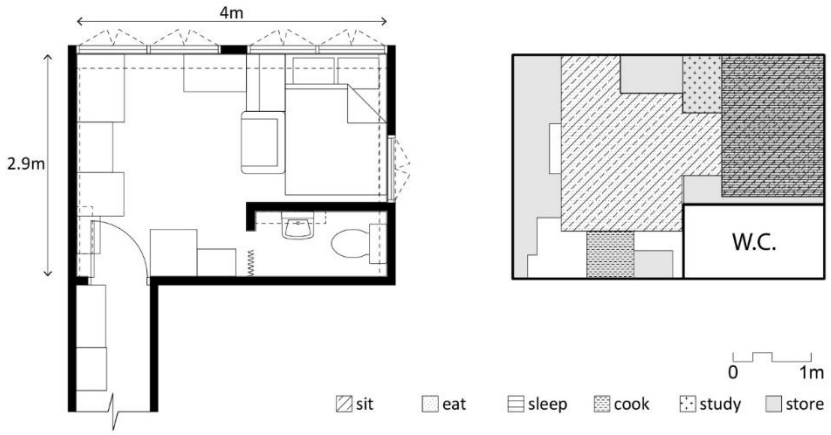

Fig. 2 Floor plan and space organization diagram of case study one.

Table 1 Furniture and function of case study one.

	Bed	Sofa	Table/desk	Chair	Kitchen countertop
Sit	X	X		X	
Eat	X	X	X		
Sleep	X				
Cook					X
Study	X		X		
Store	X			X	X

6.2 Case Study Two

The second case features Chan's family — a working mother and a 12-year-old son. The unit also locates in a mid-60s residential building in Tai Kok Tsui. Public services and facilities are easily reached within the neighborhood.

The unit is 10.9 square meters, one of the two divided from a single flat (Figs. 3, 4). Unlike the first case, there is only one 0.9m-wide window above the built-in kitchen countertop. Artificial lighting, therefore, has to be on throughout the day. The bathroom, which is about 1 square meter, is partitioned with non-structural walls next to the countertop. Naturally, the daybed is placed at the recessed corner. At the center, the living area provides circulation space in the daytime and a sleeping area at night. The wall next to the kitchen sink is allocated for storage and study purposes.

Similarly, the use of the furniture does not confine to one specific purpose (Table 2). The daybed is where the family sits, dines, sleeps, and stores. The transformable sofa provides seating, sleeping bed for the occasional visitor, study, and storage space. The desk, which is owned by the landlord, is mainly used as storage. The occupants only use folding chairs when they need extra seats for dining and other daily routines. The kitchen countertop serves cooking and storage purposes.

6.3 Case Study Three

The last family is Wong's — a working mother and an 8-year-old son. The unit locates in an early-70s residential building in Hong Hum. Given a transport interchange is within reach, the neighborhood is rather convenient.

The unit, which is only 7.1 square meters, is one of the three divided from a single flat (Fig. 5). In this case, the layout clearly defines the served and servant space. Individual bathroom and kitchen countertop separate from the main living area (Fig. 6). Opposite of the entrance, the bunkbed forms an L-shape circulation in the living space. The television, fridge, and some storage items are at the end of the bed. The study desk is right next to the window. As the remaining area dedicates to circulation, storage is on the upper level of the bunk bed.

Fig. 3 Panoramic view of case study two interior.

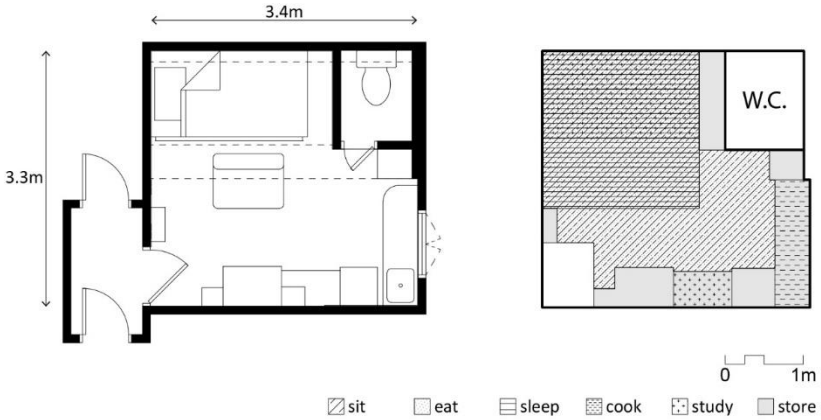

Fig. 4 Floor plan and space organization diagram of case study two.

Table 2 Furniture and function of case study two.

	Bed	Sofa	Table/desk	Chair	Kitchen countertop
Sit	X	X		X	
Eat	X				
Sleep	X	X			
Cook					X
Study		X	X		
Store	X	X	X		X

The bed is utterly essential for most daily activities, including sitting, dining, sleeping, and studying (Table 3). Taking advantage of the generous ceiling height, it also provides ample storage space above the bed.

7. Characteristics of the Furniture

Despite the different spatial organization in these three cases, the furniture shares common characteristics.

7.1 Manually Portable

The furniture, in general, is lightweight and easy to be transported manually. Large items, such as bed and full-height cabinet, are likely to be discarded within a few years. Compartmentalization is important for flexible organization. Boxes, modular cabinets, plastic bags, and basins are the most popular storage medium among the SDUs dwellers. Items in a manageable-sized component can be arranged and moved when necessary.

7.2 Easily Accessible

Accessibility describes how available furniture is to acquire. It is subject primarily to specific properties (e.g., cost), conditions relevant to the tenants' daily routine (e.g., proximity to the tenants' activity), and how the tenants exploit them.

Fig. 5 Panoramic view of case study three interior.

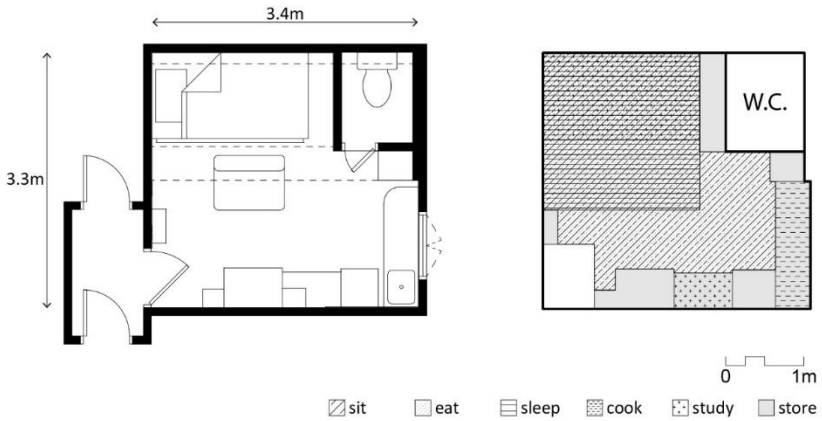

Fig. 6 Floor plan and space organization diagram of case study three.

Table 3 Furniture and Function of Case Study Three

	Bed	Sofa	Table/desk	Chair	Kitchen countertop
Sit	X			X	
Eat	X				
Sleep	X				
Cook					X
Study	X		X		
Store	X		X		X

7.3 Multi-Functional

Due to limited space, individual furniture often functions for multiple purposes. The multitude of its multiplicity is relevant to the surface size of the furniture. As demonstrated in all three cases, the bed accommodates the broadest range of activities. Contrarily, the chair has very limited use other than seating.

7.4 Temporary and Permanent

The lifespan of furniture appears irrelevant to the degree of usefulness. The distinction between temporary and permanent uses, in effect, becomes ambiguous. Furniture designed for a longer lifespan (e.g., closet) is unlikely to be repurposed during relocation. Conversely, plastic bags and other less durable pieces become an all-time resort for storage.

The “nature” of the SDU dwellers can explain the rationale of the identified patterns. 17.2% of SDUs households moved within the past five years [9]. With most SDU occupants being public housing applicants, relocation or relocations are mostly expected. Considering the nomadic lifestyle of these tenants, portability, easy accessibility, and multi-functionality are prerequisites for the grassroot community.

8. Conclusion

The current top-down approach of mass housing has caused severe impacts on both macro and micro scales: the unmet demand of the housing supply, and the separation of the natural relationship between user and dwelling. Therefore, the bottom-up alternative is necessary to enable adequate housing provision and, more importantly, reconnection between people and physical space.

This paper argues that grassroot citizens are competent to create an environment accustoms to their needs. What is missing is an opportunity that facilitates this hidden self-built capacity. The three case studies present similar characteristics in responding to the built environment: 1) program organization is hybrid; 2) storage associates with most functions; 3) furniture's portability, accessibility, multi-function, and usefulness are primary concerns. These common patterns reflect the need to incorporate user participation in architectural practice, specifically the production process.

In 1961, Habraken developed a critical philosophical framework for Open Building. The approach draws on considerations around [12]:

- The idea of intervention in the distinct levels of the built environment;
- The idea of multi-party participation in the design process;
- The idea of the interchangeable interface between technical systems;
- The idea that constant transformation in the built environment.

Nonetheless, technical complexity and procedural barriers brought the Supports movement to a halt [5]. Despite the explicit flexible intent and socially ground implications, several OB projects remain unchanged. Instructions as to how space can be modified failed to deliver to the tenants [13]. As such, this paper calls for paradigm shifts in the role of the architect, specifically:

8.1 Adaptable Space Provision

Architects are responsible for providing an adaptable space. Such space shall accommodate different social uses and physical configurations. Given the future change is unknown, generic space enables free customization for various needs.

8.2 Principles Introduction

The way of defining principles depends on project nature. Nonetheless, the goal of these principles is to appropriate coordination for future tenants and other parties. It also aims to ensure the building render a unifying outlook, despite the diverse expression of the tenants.

8.3 Know-How Delivery on Design Strategy

The spatial implication of a changing household is critical for self-builders. It aims to identify how needs can be accommodated in different scenarios. This paper suggests providing design strategies to illustrate possible solutions.

8.4 Know-How Delivery on Materiality

Both choice and treatment of the material are to be available to the users.

8.5 Know-How Delivery on Construction Technique

Most people are no experts in construction. Overly sophisticated building procedures may discourage self-builders or even thwart the project. Therefore, applying a low-technology and easily achievable technique is suggested.

8.6 Know-How Delivery on Maintenance

Maintenance is unavoidable in the dwelling process. Rather than relying solely on external help, occupants are suggested to equip with essential repairing skill set.

Much has been discussed on self-built housing in the academic realm. Much more needs to be done in developing a prominent approach in a high-density

setting. In Hong Kong, regulatory governance strictly controls the administration, design, construction, management, and maintenance procedures. Nonetheless, a healthy and sustainable self-built environment is possible when the right space and right message are delivered to the users.

Note

Area mentioned in each case study is saleable area. It refers to the sum of the area including kitchen, toilet, dining room, living room, and bedroom. External wall, internal wall, or any internal partition area is excluded.

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