Minimum Habitable Dwelling and the Transformation of Public Housing Design in Taiwan from 1920 to the 1960s

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Abstract

The public housing policy in Taiwan can be traced back to the Japanese Colonial Period (1895-1945). In the 1920s, public housing was planned for Japanese migrants by the Governor-General's Office, while the trend of modernism in the architectural field emerged and spread around the world at the same time. The concept of "minimum habitable dwelling", introduced in the 1929 International Congresses of Modern Architecture (CIAM), initiated a new era on housing construction through concepts of rationalization and standardization, which also influenced designers of public housing in Taiwan for generations. However, the interpretation and practice of the concept have evolved over different stages. Architectural professionals designed public housing from the 1920s to the 1960s, under the influences of Japanese Colonization, or the United States Aid and Military Assistance and Advisory Group. The concept of minimum habitable dwelling has been practiced and interpreted in different ways, transforming the cognition and experiences of modern houses and modern life for Taiwanese people.

Keywords: minimum habitable dwelling; public housing; modern housing design

1. Introduction

1.1 Background of Public Housing

The public housing policy in Taiwan can be traced back to the Japanese Colonial Period (1895-1945). Migrants from Japan moved into big cities where the quantity of houses was insufficient. In the 1920s, houses built by local governments were planned to be rented to middle and lower class Japanese. However, due to the rent being unaffordable for lower class migrants, most of these houses were rented to middle class officials or merchants (Wang, 2010:59~60).

Because of the prosperity of military industries, and the shortage of building materials due to World War II, investors were unwilling to build houses, thereby increasing the housing problem. The "Taiwan Residential Public Corporation", imitated from Japan, was established in 1941 by Taiwan's Governor-General to manage the public housing industry. However, the objectives of the Public Corporation failed to be realized due to the war and lack of materials. Few new public houses were commissioned to be designed and built by the Public Corporation even after the surrender of Japan in 1945; the design concepts were influenced by the new political and economic conditions which mixed traditional spatial patterns and new usage definitions.

Afterwards, large numbers of soldiers, civilians and refugees moved to Taiwan from mainland China in 1949. The housing shortage led these new migrants to build their own houses without any regulations, which endangered urban safety and resulted in chaotic landscapes. Furthermore, the housing problem imperiled the perceived legitimacy of the KMT government, which also influenced global military strategies and economic interests. In 1953, the United States Aid and Military Assistance and Advisory Group introduced self-building concepts practiced in the United States and experiments of housing industrialization; as a result, the features and practice of public housing in Taiwan were further mixed and complicated.

1.2 Minimum Habitable Dwelling and Public Housing

In 1929, the Second Conference of the International Congresses of Modern Architecture (CIAM) held in Frankfurt introduced the "minimum habitable dwelling", which has been valued and followed by architectural professionals globally (Uchida, Okawa, and Fujiya (Eds.), 2008:105). The minimalist concept
was derived from functionalism, which calculated minimum space standards for living and designed the most compact plan of a house. The members of CIAM argued that houses should be built according to rational, standardized concepts, and consumers should rethink and correct personal unnecessary demands according to social situations, which meant lowering personal needs and satisfying public demands (Frampton, 1999:269-270).

Concepts of minimum habitable dwelling have influenced several generations of designers of public housing, including those in colonized Taiwan. Public housing may be regarded as a solution for the housing problem faced by middle and lower class people due to population concentration in industrialized cities. It may also be seen as the result of the modernization of housing in the modern era.

1.3 Research Objectives and Methods

In recent years, research on public housing has shifted its focus from minimum habitable dwelling to affordable houses and industrial housing. However, public housing was criticized as it became monotonous due to high standardization, concentration and mass production. The concept of "Open Building System" was introduced into housing design and technology, by which the issues of standardization and individualization may coexist under the "frame" concept (Warouw et al., 2010; Habraken et al., 1976).

In Taiwan, these issues were immediately and fully accepted, while the historical process was seldom reviewed and analyzed in depth. In this sense, the first objective of this research is to explore the transformation of the design of public housing from 1920 to the 1960s. Secondly, it attempts to analyze the mixed features of the public housing derived from the development process, in which the concept of minimum habitable dwelling was integrated under different political powers and social backgrounds.

The method of historical analysis research is adopted to explore and analyze the historical background, significances of design thinking and influences of each stage. Discussions focus on different meanings of minimum habitable dwelling due to the influences of Japanese Colonization and U.S. Aid in Taiwan.

2. The Influences of Japanese Colonialization

Since 1921, when the local administration and financial systems were beginning to be established in Taiwan, the Governor-General expanded the coverage of economic protection affairs to the housing problem, with the mission of assisting impoverished people. With the City Improvement Plan, a new image of the city has been created for people (Wu, 2010), and public housing, as a modern welfare project and a new policy for people, was also initiated with the Plan in major cities. There were four sizes and styles for such houses, including 10-20 tsubo (equal to 33.06-66.16m²) in area, and single, twin, or other styles with a Japanese house form, followed by those built for government or company staff. In the 1930s, public housings were built in Kaohsiung, Taichung and Hsinchu Prefectures to solve the housing problems. Building budgets came from local governments or subsidies from the Governor-General's office (Yeh, 2003:43). The purposes of those houses are summarized as follows: 1) to provide housing for middle or lower class people with lower rent cost (typically, less than 30% of market price) and safe and hygienic environments; 2) to demonstrate the superiority of Japanese style houses and living culture. The designers of these houses, civil department officers of local governments, followed the design guidelines of minimum habitable dwelling publicized in CIAM, and were interested in the reformation of small modern houses.

The concept of minimum habitable dwelling was not reflected in the design and construction of public housing until after the 1930s. The concept comprises an appropriate plan design, rationalization and standardization. It could be analyzed according to several aspects. Standardization of housing in Japanese architecture means the traditional standardized space from jō (1.8m x 0.9m, 2 jō equals 1 tsubo) for the floor plan. The meaning of standardization in minimum habitable dwellings may not be represented by the house size or rent, while the standard from basic unit and composition was significant. Appropriate plan design was interpreted through minimizing and reorganizing space and circulation in a house. A typical house plan of public housing in this period was organized by zasiki (living room), ina (room), chanoma (dining room), daidokoro (kitchen), bathroom and toilet (Fig.1.). The design, which changed spaces in regard to customary functions further represented the rationalization concept. The mixed space used for sleeping and eating was changed to a specific dining room space and eating table, a bathroom and toilet were built for hygienic reasons, while the house style with the center for guest visiting was abandoned, etc. The concept of minimum habitable dwelling before 1941 based on specific function and independence in each space has been recognized (Suzuki, 2002:95–96). A rational minimum habitable dwelling referred to the concept of specific rooms with specific functions, and livable space meeting hygienic and healthy requirements.

The realization of minimum habitable dwelling can be traced back to World War II. The mission of the Taiwan Residential Public Corporation, established in 1941, was to provide a large number of affordable houses for people through the cooperation of government and people concerning the provision of materials and finance. In this period, minimum habitable dwelling referred to building houses with proper management or minimum materials. Four basic types of houses, 10-25 tsubo (33.06 - 82.64m²) in area, were built in major cities like Taipei, Hsinchu,
In the war period, the concepts of appropriate plan design and standardization were recognized as the standard plan and drawn in different sizes, whereby only the basic functions were satisfied while individual or additional demands were discarded (Fig. 2.). Seven standard types of wartime houses were introduced by the Taiwan Wartime Committee of Building Construction in 1943. (Fig. 3.) At the same time, the Public Corporation also introduced house plans using local brick, wood, or bamboo as materials. Small houses from the Committee and houses introduced by the Public Corporation fully reflected the concept of minimum habitable dwelling; these cases also lost the purpose of rational space for life. Umezawa, Construction Director of the Taiwan Residential Public Corporation, argued that structural strength and function in these house plans during wartime were far from ideal public housing (Umezawa, 1941:146–149).

After the end of the war in 1945, the KMT government began to employ engineers at the Taiwan Residential Public Corporation, while the concept of minimum habitable dwelling was carried on. In 1946, a new public housing project in Keelung was commissioned to the Public Corporation (Fig. 4.). In that case, design concepts used during the wartime were adopted, such as a simple plan, economical materials and low cost for rapid construction, while the size of each unit was smaller than the houses in wartime (only 9.8 and 5.7 tsubo, 32.40 and 18.84m² in area). Even for other projects built in the 1950s and by other institutes, the houses were smaller than 10 tsubo (33.06m²) (Fig. 5.). In this sense, the minimum habitable dwelling was transferred from wartime concepts to design guidelines for minimum standards and the most affordable houses for the middle and lower classes. However, these houses were not able to represent ideal or rational living environments as they were really small for a family. Nonetheless the concept of minimum habitable dwelling continued to be practiced through flexible usage in rooms, and the custom of storing/furnishing daily goods in the traditional Japanese lifestyle.

However, the flexible feature of room use was changing. Although in most cases a sliding door was still used to maintain flexibility and openness, a fixed wood partition wall was built in some cases, whereby
the specific function(s) of a room was (were) further defined (Fig.6.). For instance, the living room and dining room were combined into a single fixed space. This concept was similar to the traditional life style of Taiwan before Japanese colonization, and was preferred by the KMT government. In the early post-World War II period, Japanese style housing, with the feature of fewer corridors, tatami in the rooms, and flexibility according to usage, was designed by architects with a Japanese or American architectural background. After the senior Japanese architects and engineers were repatriated, the Japanese flexible space style and traditional Taiwanese lifestyle were mixed into a new public housing design by Taiwanese architects who had received a Japanese education.

3. The Influences of the United States Aid, and the Military Assistance and Advisory Group

In 1955, public housing projects were built with the United States Aid Counterpart Fund Aid. Transforming from the concept of minimum habitable dwelling, new public housing introduced the concepts "self-help" and "core house", which became successful in Taiwan and would be used in mainland China in the future (Burroughs, 1954:6). The self-help concept was also legislated in 1955, by which different self-help building projects and loan regulations were set. By reducing the house and land price, people could pay off the loan through self-help labor in their free time (Wang, 1973:88). The first experimental project to adopt the concept of self-help under US aid was built in the Keelung Harbor area, in 1953.

Besides, the "core house" concept which contained minimum habitable space and the design for possible extension might have provided the lowest cost for living. In this sense, public housing was further transformed from the good model of frugal life to the reflection of a self-help and self-renewal spirit. With the government policy of making homes affordable, the plan and size of public housing were oriented toward the needs of middle and lower class core families, which was quite similar to the housing purchase tradition of the American core family.

In 1957, the Public Construction Bureau in charge of public housing, and the Military Assistance and Advisory Group noted the problem of habitability. The minimum habitable standard should not only be economically affordable, but also be suitable for families of different sizes. In 1963, a design formula for minimum habitation space standards was introduced, which was influenced by the standard published by the International Federation on Housing and Planning (IFHP) in 1957. This formula operated by dividing a house into several spaces with different functions, with the minimum space requirement accumulated from each minimum space (Fig.7.) (BES Engineering Inc. (Eds.), 1973:28). In the design guidelines of public housing in 1963, each unit was limited to 8-20 tsubo (26.44-66.12m$^2$). Besides, different floor plans for families from two to seven members in "room area standard" were demonstrated. The concept of minimum habitable dwelling was then transformed to minimum habitable units which represented only the minimum space for living rather than the minimum quality for living.

Furthermore, the meaning of rational family life also changed, from flexible use spaces in a house, to specific rooms according to designated user(s) or function(s). For example, the bedroom should be used only for sleeping rather than for mixed use as a dining room or sitting room. Compared with the cases designed earlier, and the case designed by designers of the Public Construction Bureau who adopted American concepts, rooms in the former had the same size, which implied that all rooms were provided for non-specific people in the family (Fig.8.). While in the latter, all of the rooms were built with fixed partition walls, and equipped with closets or other furniture which recognized the specific areas and functions of the room. Besides, rooms were designed according to the family hierarchy. The larger bedroom was designed for parents, while secondary bedrooms were designed for children. The concept of privacy initiated from American culture was introduced and practiced through public housing design (Fig.9.).
Due to the population explosion, it was argued that a rational public housing design in the city should be efficient in terms of the limited land, by which high-rise housing was recommended. The standard drawing of public housing in 1961 showed the experiment on 3-story apartment buildings. Later, 5-story apartment buildings built with reinforced concrete became popular in cities. At the same time, a construction management system was introduced by the Advisory Group; however, the specifications of building parts were still unclear.

4. Conclusion: The Transformation of Meaning of Minimum Habitable Dwelling

The original intention of minimum habitable dwelling focused on standardization, rationalization of space and appropriate minimum space for living. With the influences of Japanese Colonization, the house designed upon the Japanese tradition of "jō" could be seen as a form of standardization. However, this was not derived from the concept of economical construction. Not until World War II was it realized due to the shortage of materials. The parts and composition of public housing became standardized. With the U.S. Aid after World War II, new concepts and materials were introduced. For the purpose of keeping the cost down on construction, standard drawings of a house were provided for buildings. A minimum habitable dwelling was not only the most efficient and rational
Table 1.

| Issues                          | Standardization                                                                 | Rationalization                                                                 |
|---------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Japanese Colonial Period        | • Follow the tradition of modular space of jō (1.8m x 0.9m)                    | • Flexible usage of rooms initially followed the Japanese life style             |
| 1920-1942                       | • It was considered as the prototype of standardization, while unified standards| • Specific function and independence for each space was gradually recognized,    |
|                                 | and construction modules were absent or unclear                                 | especially concerning service spaces                                           |
|                                 | • Norms were established during war-time to save materials                     |                                                                                  |
|                                 | • Composition, scale, and construction methods were standardized               |                                                                                  |
|                                 | • Standardized construction modules were initiated                             |                                                                                  |
| U.S. Aid after World War II     | • Sizes of areas for different units were regulated in design guidelines        | • Specific function for each space                                              |
| 1953-1965                       | • Standard drawings were prepared                                              | • Efficiency concerning land, high-rise building                                |
|                                 | • An initial standard construction management system was introduced, but it was| • Personal rooms, concept of privacy                                           |
|                                 | still far from an industrial standard                                           |                                                                                  |

Standardization and rationalization concepts in the minimum habitable dwelling should be understood and interpreted differently due to specific social and economic backgrounds and cultural habits.

plan, but also the most affordable house style for middle or lower class people.

The design of public housing was for core family life, regardless of the actual composition of the family over time, which was the basic evolution of modern housing under the influence of Modernism. Under the influence of Japanese Colonialization, the style of houses followed the spirit of modernism, while the spaces and features in the house with flexible rooms, in relation to both chanoma and daidokoro, also contributed to the minimization of housing design. Under the influence of U.S. Aid, the concept of "core house" was introduced for low cost public housing, while each room had a specific function, such as living room, kitchen, dining room, bathroom, primary bedroom, etc., representing an American lifestyle in a core family. The design of personal bedrooms was also based on the notion of privacy and individualism of American culture. In this sense, appropriate minimum space had been realized.

The characteristics of standardization and rationalization are summarized as Table 1.

It was a historical process, from flexible use and universal space, to specific functions and private space. At the same time, minimum habitable dwelling, an international design reflecting functionalism, had been introduced and practiced in various forms through governance of housing policy, and the interpretation and transformation by professionals.

Note

The Japanese adopted "City Improvement" in the early stage of their urban transformation. The City Improvement Plans and the urban planning executed during the Japanese Period were "scientific" in essence (Fu, 2013). In these plans, roads were broadened, and arcade spaces (Ding-a-ka) were created for safety reasons. Besides, sanitation engineering was also founded during this process.

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