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The Livability of Social Housing Communities in Taiwan: A Case Study of Taipei City

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Abstract: Social housing is a welfare strategy geared to meeting the housing needs of working people and the middle class. Apart from resolving the basic housing problem of disadvantaged members of society, social housing also seeks to provide excellent residential quality, and achieve the goal of livable cities via enhancement of the quality of the urban living environment as a whole through a community-based approach. The goal of this paper is to explore social housing community development strategies for Taipei City, and examine how they can create livable social housing communities. The chief focal points include determination of problems currently faced by social housing communities in Taipei and formulation of development strategies based on livability criteria. After employing literature analysis to gain an understanding of problems cited in the literature and connected with current standards, the integration of livable city assessment items are discussed in the context of Maslow's hierarchy of needs. The publicly-owned idle space consisting of a former Army Maintenance Plant base in Taipei's Xinyi District that can be reused as a social housing community was chosen as the study case, SWOT analysis of the site's internal and external environmental factors and its current state of development were performed, and finally conclusions have been submitted concerning the development needs of livable residential communities and recommendations for Taipei City addressing social housing community development strategies. It is found that current development strategies tend to neglect communities' basic economic loads, and that an appropriate development strategy be constructed on the basis of Taiwan's current "Eco-Community Evaluation System" is recommended by incorporating basic community economic load factors, which will facilitate the sustainability of community management and maintenance.

1 INTRODUCTION

As part of its mission of investigating global competition and climate change, the United Nations Human Settlements Program's (UN-HABITAT) reports on global human habitats, emphasizing the themes of urban livability, and stress that a livable city should be people-oriented, meet residents' quality of life needs, and allow residents to live and work in contentment; a livable city is a place which is suitable for human work, living, and dwelling; in economic, social and environmental development, a livable city offers a good living environment, and is able to meet residents' material and spiritual needs

([Wikantiyoso & Tutuko, 2013](#); [Yeh & Wu, 2010](#)). For a variety of reference sources, there are various assessments of livable cities worldwide, and many cities with good livability are also selected on an annual basis in accordance with various assessment criteria. On the basis of the world's highest-ranking cities and the content of different assessment instruments, city livability should encompass at least good economic development, stable social security and welfare, convenient and complete life functions, adequate medical and educational resources, and a good-quality living environment.

Livable communities ensure that the cities where they are located have better livability, can provide community residents with an economically vibrant, safe, healthy, and comfortable living environment, and offer complete life functions, so that residents can live and work in peace and stability. The elements of a livable city's quality of life needs should include shared-prosperity communities (local economic development), safe communities, caring communities (social service development), green communities (environmental development), appropriate places of residence, and sustainable communities ([Taylor, Barr, & West, 2000](#)). From the perspective of Maslow's hierarchy of needs, the elements of a livable city should correspond to lower- and higher-level needs as follows: (1) good economic development meets Maslow's most basic physiological needs; (2) adequate medical resources and stable social security and welfare meet safety needs; (3) convenient and comprehensive life functions meet love and belonging needs; (4) adequate educational resources and coexistence with the environment meet esteem needs, and (5) a high-quality living environment meets the need for self-actualization. This study employs this framework to explore the basic elements of social housing community livability.

Due to poor community living quality, public housing in Taiwan was originally stereotyped as having poor quality, and public housing developments were seen as undesirable facilities ([Liao, 2012](#)). To change this state of affairs, the purpose of social housing should be to improve the housing market, enhance residential quality, and ensure that all people can live in appropriate housing and enjoy a dignified living environment. And when homes are only rented, and not sold, residential space can be used flexibly in a cyclical fashion, and residential living costs can be reduced while maintaining a good-quality living environment. What are the problems currently facing efforts to enhance the livability of social housing communities in Taiwan? What are appropriate development strategies for livable social housing communities? This study takes a former Army Maintenance Plant base in Taipei City, which is slated for development as a social housing community, as the study case, and investigates environmental impact factors inside and outside the site. Employing SWOT analysis in connection with the elements needed for a livable city and the concepts of Maslow's hierarchy, this study analyses the livability development strategy of the social housing community based on the five elements of a livable community.

The development strategy recommended in this paper is based on Taiwan's existing "Eco-Community Evaluation System", but incorporating economic factor considerations, and employs an upgraded system more appropriate for practical applications, which improves on the current lack of consideration paid to economic factors in social housing community development planning. This strategy represents a shift from the exchange "eco-innovation" framework toward a greater focus on environmental protection, while also addressing both environmental and economic factors within a "circular economy" framework ([de Jesus & Mendonça, 2018](#)). The strategy further

attempts to resolve conflicts between environmental protection and economic development, while seeking to achieve "livable" results in practice, and bringing an approach closer to environmental sustainability.

2 CONTENT AND METHOD

2.1 Literature Review

2.1.1 Livable Cities

[Suresh \(2016\)](#) believes that to become a livable city with a healthy and productive population, it is first necessary to resolve such urban environmental issues as sources of clean water, reduction of air and noise pollution, effective resolution of health and sewerage problems, and possession of good traffic conditions able to reduce the commuter pain index. [Kashef \(2016\)](#) pointed out that a holistic view of a livable city should incorporate the aesthetics and physical properties of architecture, streets, and regional development; and another point of view is that cities should focus on the sustainable development of the environment.

In the case of recent global assessments of livable cities, the standard items of assessment used by the [Economist Intelligence Unit \(2016\)](#) are stability (accounts for 25%; concerns personal safety, such as prevalence of petty crime, threat of civil unrest/conflict, etc.), healthcare (accounts for 20%; concerns medical care, such as quality of private healthcare, availability of public healthcare, etc.), culture and environment (accounts for 25%; includes humidity/temperature rating, cultural availability, and consumer goods and services, etc.), education (accounts for 10%), and infrastructure (accounts for 20%; includes quality of public transport, quality of energy provision, water provision and quality of telecommunications, etc.). The US human resources consulting firm Mercer LLC has conducted regular quality of life assessments for more than 460 cities worldwide to assist companies and professionals in assessing allowances and bonuses. The assessment benchmarks of the 2016 Mercer Quality of Living Survey ([Mercer, n.d.](#)) are political and social environment (crime, safety, and stability), economic environment (currency exchange regulations and banking services), socio-cultural environment (media, censorship, and personal freedom), medical and health considerations (hospital services and medical supplies, air pollution, infectious disease, and waste removal), schools and education (private and public schools), public services and transport (transport, network and utility services), recreation (restaurants, theatrical and musical performances, cinemas, sport and leisure activities, market and consumer goods), housing and natural environment (climate, natural disasters and extreme weather). A 2010 study of livable cities in Taiwan by [Yeh and Wu \(2010\)](#) refers to the seven global livable city assessment aspects of "public safety", "social welfare and healthcare", "education, culture and leisure recreation", "environmental ecology and living quality", "urban life and service facilities", "financial autonomy and financial burden", and "public economic power and viability".

In view of the content of these different livability assessment items, urban livability should include at least robust economic development, stable social security and welfare, convenient and sound life functions, adequate medical and educational resources, and a good-quality living environment. In other words, apart from convenient life functions, welfare, medical care, and

education, good economic development and construction must also take into consideration damage to the environment caused by development, and improvement and maintenance of environmental quality, so that residents can enjoy stable survival and development in a prosperous, convenient, healthy and comfortable environment.

2.1.2 Livable Communities

What are the characteristics and constituent elements of communities needed in order to realize a livable city? The livable city concept emphasizes a human-centered perspective, and it is possible to satisfy livability requirements when the working and other needs of people living in a city are met. The livability of a human community has been defined as the ability to lead a pleasant, safe, affordable, healthy, and sustainable life, and the residents of the community can easily reach any place they want to get to ([Hahlweg, 1997](#)). In 2000, scholars suggested definitions for the elements of quality of community living, which they proposed should include the following six items: A shared-prosperity community (local economic development), safe community, caring community (social service development), green community (environmental development), appropriate residences and sustainable community ([Taylor, Barr, & West, 2000](#)). These correspond to the five levels of needs in Maslow's hierarchy of needs, which consist of physiological needs, safety needs, love and belonging needs, esteem needs and the need for self-actualization ([Maslow, 1954](#)). These five levels of needs can be linked to the corresponding elements of a livable community as follows:

(1) The most basic needs: A community should be able to provide residents a residence with costs that can be borne with their working incomes. In addition to being able to bear living costs, residents should be able to obtain sufficient, convenient food, clothing, and transportation ([Kochera & Bright, 2006](#)). In keeping with the items required by a livable community, community residents should enjoy good economic development conditions.

(2) Low level needs: After satisfying the need for food, clothing, housing, and transportation, a community should also provide a safe and friendly barrier-free environment with adequate medical resources, so as to meet the need of residents to live and work in contentment and good health ([Riffe, Turner, & Rojas-Guyler, 2008](#)). In keeping with the needs of a livable community, a community should possess adequate medical resources and stable social security and welfare.

(3) High level needs: A community should be able to create a sense of community identity and belonging among residents. As for the community environment, care for children and the elderly, green leisure facilities and spaces enabling residents to engage in exercise and social contact, and convenient transportation and social networks can meet residents' need to create a warm and caring environment ([Rousseau, 2010](#)). In keeping with the need of a livable community for convenient and comprehensive life functions, a community should have a friendly environment allowing residents to communicate with and socialize with each other.

(4) Higher-level needs: Community residents may have sufficient educational resources, clearly understand their living environment, and rely on mutual aid and sharing to create ecological cycles in their environment, which will help establish a self-sufficient livable community. Respecting the natural environment, and creating and maintaining biological diversity in the environment will enable residents to coexist with the natural environment, and obtain respect and feedback from the environment, which will satisfy their

need for an excellent quality of life ([National Research Council, 2002](#)). In keeping with the items required by a livable community, a community must have adequate educational resources, while maintaining a living environment of mutual coexistence with nature.

(5) Highest-level needs: After the community plans and builds an environment to meet residents' living, safety, social contact and respect needs, it can take into consideration the need for economic development and low energy consumption and realize a high quality living environment with sustainable development, achieving the goal of self-contained cyclic development of the livable community ([Ellen MacArthur Foundation & McKinsey Center for Business and Environment, 2015](#)). In keeping with the items required by a livable community, a community should have a good-quality living environment. The constituent elements of a livable community corresponding to the levels of Maslow's hierarchy of needs are shown in the figure below.



Figure 1. The constituent elements of a livable community paired with the levels of Maslow's Hierarchy of Needs (Source: Modified by authors, concept from [Maslow \(1954\)](#)).

2.1.3 Social Housing

In the eyes of governments worldwide, housing is an important and widespread issue closely connected with peoples' livelihoods ([Wei et al., 2016](#)). Social housing is intended chiefly to solve the problem of provided housing to city residents. Governments build and subsidize social housing, and restrict social housing residents to persons who have no homes or who are socially or economically disadvantaged, which ensures that these individuals can also enjoy appropriate housing. Early public housing in Taiwan was called "national housing", and the *Public Housing Act* was issued by the Ministry of the Interior in July 1975 as basis for the implementation of the relevant measures, although Article 2 of the *Public Housing Act* states that public housing refers to housing planned by the government and sold or rented to low-income households or built by such households with government loans or loan interest subsidies. However, unlike social housing in other countries, which emphasize the principle of renting and not sale, social housing in Taiwan generally involves the subsidized sale of homes, and is seldom rented to residents. In order to reduce the cost of home ownership, most public housing is built inexpensively, and although most public housing is adequate to meet residents' needs, there have been many lingering problems with poor community environmental quality and building maintenance issues. To date,

responding to changes in Taiwan's economic and social situation, as well as to residential development trends, the *Public Housing Act* was replaced by the *Housing Act*, which was promulgated in 2017, and the *Public Housing Act* was abolished on January 4, 2015. These changes reflected domestic conditions and needs and were implemented in reference to foreign social housing practices.

The intent of the *Housing Act* set forth in Article 1 is to establish a robust housing market, improve the quality of housing, and thus allow all citizens to enjoy suitable housing and a dignified living environment. In contrast to the government's original strategy of drafting special laws governing public housing, the *Housing Act* includes the quality of housing as a whole, including public housing, among its considerations. The third chapter defines public housing as "social housing," showing that social housing is an important part of the *Housing Act*. Table 1 provides a comparative look at the differences between social housing and the original public housing.

Table 1. Comparative look at differences between original public housing and social housing.

Type of housing	Social housing	Original public housing
Management	public sectors, private organizations	public sectors
Management approach	Rental (At present, the Taipei Social Housing Lease Regulations limit lease terms to a maximum of six years in the case of tenants who meet general tenancy terms and to 12 years in the case of special tenants)	Sale or rental (in the past, most public housing was sold)
Development approach	Construction by the government: (1) New construction (direct construction, joint construction and allocation of housing units, and construction with private participation and establishment of subsidies). (2) Additional construction, renovation, repair, and modification of existing public buildings. (3) Acceptance of donations. (4) Renting and purchasing private housing. Construction by private organizations: Can be newly built, enlarged, modified, renovated, and repaired.	(1) Direct government construction. (2) Self-built with loans. (3) Built through incentives to invest. (4) Assist for purchase by residents.
Applicable subjects	A family or an individual who has no home or a certain income and whose property is below a baseline value; persons 30% above the baseline (originally 10%, but adjusted in an amendment) must provide evidence of a special situation or identity; the Act's provisions are as follows:	Low-income families

	(1) Low-income households, (2) families in special circumstances, (3) persons with three or more children who are minors, (4) persons under the age of 25 who are unable to return home after being placed in a residential institution or foster home, (5) senior citizens aged 65 and above, (6) domestic violence or sexual assault victims and their children, (7) persons with disabilities, (8) persons infected with human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS), (9) indigenous citizens, (10) disaster victims, and (11) homeless persons.	
Purpose	To enable all people to live in suitable housing and have a dignified living environment.	Providing shelter to low-income families
Value	Providing rental housing purely meeting housing quality needs, managing occupants' use behavior, reduce use of housing for the commercial purpose of gaining profit, improve the housing market, and enhancing the quality of living.	Providing non-profit residential sale or rental, so that disadvantaged people have houses in which to live.

(Source: Reconstruction by authors, including data from the *Public Housing Act (Construction and Planning Agency Ministry of the Interior, 2005)* and *Housing Act (Construction and Planning Agency Ministry of the Interior, 2011)*)

From the above comparison, it can be seen that legal policies relating to public housing have shifted to consideration of housing quality as a whole from the original focus of public housing on solving the housing problems faced by disadvantaged groups. As for applicable subjects, while still providing a certain degree of protection to vulnerable socioeconomic groups, the scope of potential residents has expanded to all members of the public without their own homes. The purpose of non-profit-based public housing is to meet the housing needs of all people, including vulnerable socioeconomic groups, and also to ensure the quality of these individuals' living communities. As a consequence, community environmental quality will become the basic standard for both public and private housing. Taiwan's public housing also includes "suitable housing" and "youth housing", but these are handled with the approval of the Executive Yuan, and there is as yet no clear legal basis for implementation. As a result, these types of housing are not discussed in this study. Social housing, as defined in Article 3 of the *Housing Act*, refers to housing and necessary facilities built by the government or by the private sector with subsidies from the government that is primarily rented, and at least 30% must be rented to economically or socially disadvantaged persons. The goal of this study is to investigate what kinds of planning strategy can foster better urban livability and create livable social housing communities.

2.2 Methods

This study takes the former Army Maintenance Plant base in Taipei City, which is slated for development as a social housing community, as the study case. A review of the literature is first performed to define livable city, livable community, and social housing community, and to determine how to build a livable city as the goal. Case analysis and SWOT analysis focusing on existing conditions inside and outside the site are then conducted, and the results of analysis are used to draft a development strategy for livable social housing communities. This study's research flowchart is shown in Figure 2:

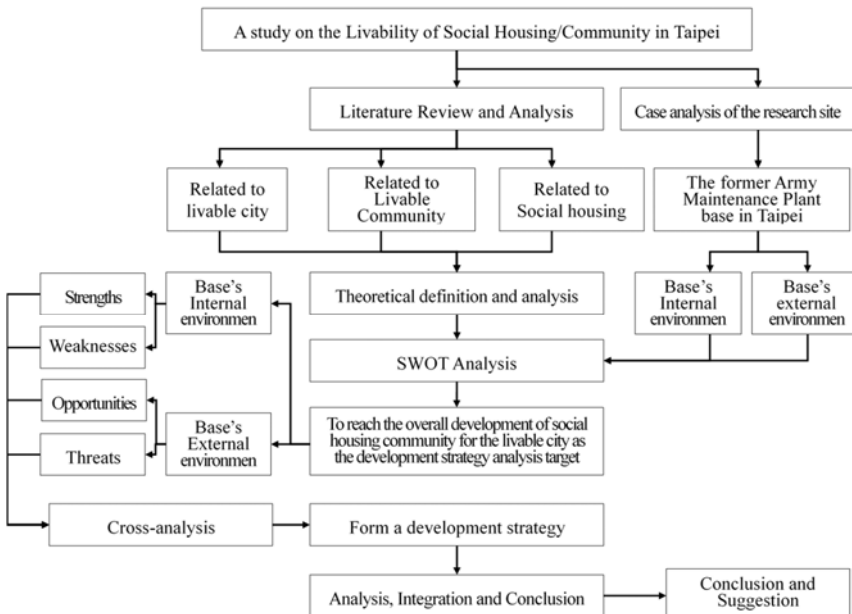


Figure 2. Research flowchart.

3 RESEARCH ANALYSIS

3.1 Case study of the former Army Maintenance Plant base in Taipei city

The case chosen by this study consists of a former Army Maintenance Plant base located in the Xinyi District of Taipei City. According to the content of the June 2005 Land Details Plan for the former Army Maintenance Plant base, the Ministry of National Defense moved this service center to the Xindian District in July 2004. The site now is idle, and has been transferred to the National Property Administration, Ministry of Finance for disposition, which means that the former service center no longer has its original spatial functions. The Xinyi District is a very important part of Taipei; there is much construction activity in the district, and development planning is very representative of Taiwan (Tsai, Chen, & Ning, 2016). According to its original content, the plan for the site is chiefly to establish a healthy residential community for the elderly and also to incorporate a biomedical technology R&D function, and this plan will be implemented in conjunction with the Ministry of the Interior's "Program for Promoting Private Participation in Construction of Housing for the Elderly". In response to social and policy changes, a May 28, 2015 press release from [CTnews \(2015\)](#) pointed out that

this site is expected to be reused for the construction of a youth creative city. A press release from August 19, 2016 (CTnews, 2016) also indicated that, in order to tie in with the new government's promotion of a social housing project, the Taipei City government has negotiated with the Ministry of National Defense concerning development of the former Army Maintenance Plant base as a social housing area by means of "cooperative development". The scope of this site is shown in Figure 3.

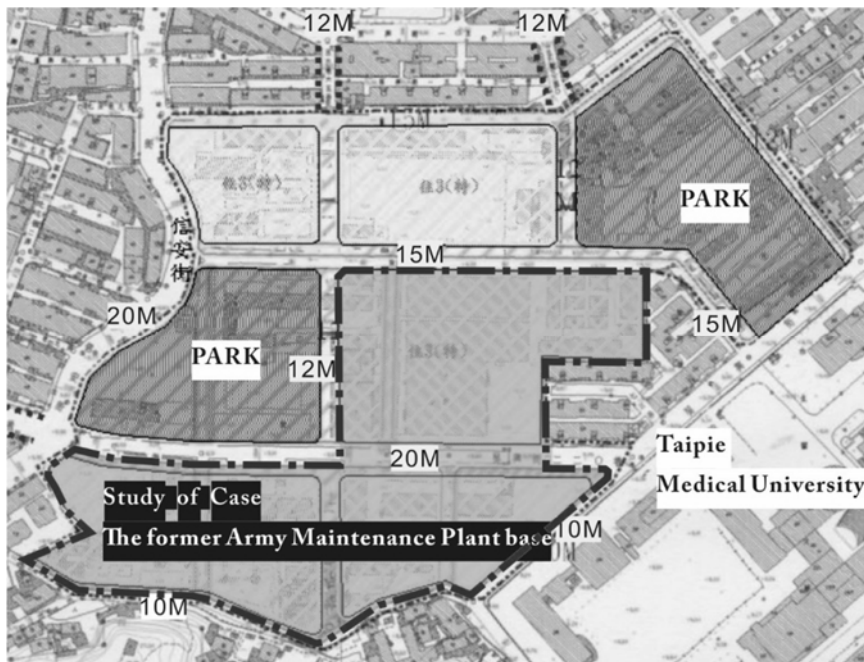


Figure.3 The scope of the former Army Maintenance Plant base. (Source: [Taipei City Government \(2005\)](#))

3.1.1 External environment at the case site

(1) Working and living environment in Taipei:

Taipei is Taiwan's administrative and economic center, and its administrative resources and tax revenue are higher than those of other cities in Taiwan, and its public transport system, social welfare and job opportunities are also better than in other cities. On the other hand, its cost of living is higher, and due to excessive real estate speculation, its housing prices have remained consistently high. It is not easy to live in Taipei, which has forced many people working in Taipei to move to neighboring cities in order to reduce their housing costs and increase their quality of life, which has come at the expense of increased commuting time and cost. According to a survey of the public's social housing needs and expectations commissioned by the Ministry of the Interior, among members of the public with social housing application qualifications, the most important criteria they consider are "rent" (57.9%), "ease of access" (54.2%), and "location" (34.8%); looking at the influence of other aspects on social housing, another roughly 5.2% of the respondents believed that social housing policy could raise the willingness of residents to marry or have children (Ministry of the Interior, 2017).

(2) The surrounding transportation system:

The site adjoins 20m Xin'an Street in the west, and a 15m lane in the southeast; the main access roads to the site consist of the 30m Keelung Road and 20m Zhuangjing Road. Due to the narrowness and curvature of the roads

adjacent to the site, vehicle access to the site is inconvenient, and the main access roads have large traffic volume and low road service levels. In addition, there is some distance from the site to the nearest MRT station, and the site remains to be connected via other forms of transportation and public transport (see Figure 4 for the area around the base).

(3) Nearby public facilities:

The chief residual public facilities include Sanxing Elementary School, Sanxing Market, and Sanxing Park in the north, George Vocational High School in the southwest, and Taipei Medical University in the southeast (see Figure 4 for the area around the site).

(4) Problem faced by the social housing community:

Nearby residents may feel concern that social housing may reduce the quality of the surrounding area and lead to falling house prices. In line with the government's active promotion and explanation of social housing policies, the Ministry of the Interior commissioned a survey of public support for social housing and gauged local residents' acceptance of the establishment of social housing nearby, with the intention of finding ways to increase public acceptance and favourable impressions. Items eliciting the highest levels of public concern included “proper management of social housing” (85.1%), “providing feedback to local residents” (76.8%), “increasing common use space in the neighborhood” (76.3%), and “architectural design” (63.5%) ([Ministry of the Interior, 2017](#)).

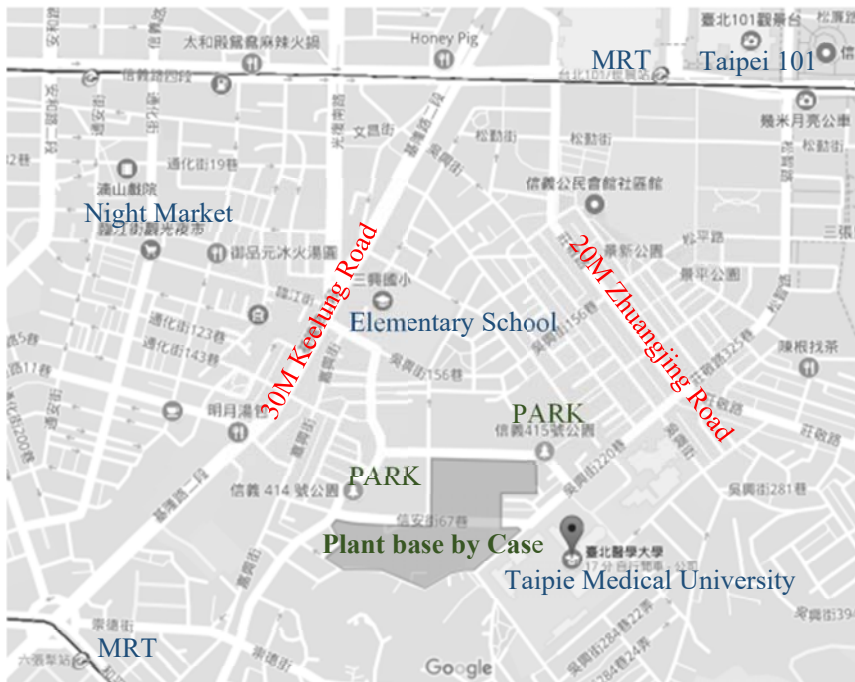


Figure.4 The map of the area around the base.

3.1.2 Case site internal environment

(1) Base status:

Land use zoning in the original urban plan chiefly consisted of class 3 residential area and road land; private land accounted for only about 7/1,000 of the total site area, and the remainder was public land. The site is currently idle, and some of original buildings are still on the site. As for the land use zoning of adjacent land, in addition to school land and park land in the north

and a protected area in the south, most of the remaining land consists of class 3 residential areas. Since the site has a certain size, comprehensive development promoting the integrity of living functions can meet the needs of the public.

(2) Base reuse planning:

The press releases cited above only refer to the current state of development. That social housing is currently the only form of public housing with a clear legal basis ([Ministry of the Interior, 2017](#)) and can further the government's realization of housing justice, should serve as a major consideration in the reuse of public idle space for development of a social housing community.

(3) Problems faced by social housing communities:

In the case of social housing that can only be rented and not sold, an important task is to determine the duties and powers of landlords and tenants, and attention must also be paid to maintenance during use and promotion of community participation, with the goal of achieving an effective community, promoting community interests, and maintaining a good-quality residential environment. However, limited by the current restricted supply of social housing, the actual implementation content has been limited to determination of the rental period, and this limiting factor will unfortunately affect tenants' motivation to participate in community affairs ([Kochera & Bright, 2006](#)). There is therefore need for effective strategies for creating social housing communities.

3.2 Developmental strategy for promoting the livability of a social housing community: SWOT analysis

The goal of development strategy analysis was to determine how to develop social housing communities within a livable city. While reflecting the definitions of livable city, livable community and social housing, the investigation in this study combined analysis of the site's internal and external environment, cross-analysis of the strengths, weaknesses, opportunities and threats of different strategies, and formulation of a livability development strategy for the social housing community in the study case.

This study determines the current status, weaknesses, opportunities and threats of the case site—the former Army Maintenance Plant base in Taipei's Xinyi District. The results of the analysis are shown in Table 2: SWOT Analysis of Livability Development of a Social Housing Community.

Table.2 SWOT Analysis of Livability Development of a Social Housing Community.

	Strengths	Weaknesses
Internal analysis	<p>S1: Because the site constitutes public land, development as public social housing will entail relatively low acquisition costs.</p> <p>S2 : The land can be developed on a relatively large scale, which will facilitate holistic development of living functions.</p> <p>S3 : Renting, and not selling, social housing can reduce</p>	<p>W1 : The public transportation system's road service standards are low.</p> <p>W2 : The abandoned buildings still present at the site must be handled properly during development, so as not to cause construction waste or pollution.</p> <p>W3 : Since the social housing is rented and not sold, and actual</p>

<p>External analysis</p>	<p>the cost of housing and facilitate planning of living environment quality.</p> <p>S4 : Renting, and not selling, social housing can facilitate the regulation of tenant use behavior through the content of rental contracts and allows the public sector to implement managed living environment quality.</p>	<p>implementation during the current period is limited to the lease term, this may give tenants the feeling of being only temporary residents, which will reduce their sense of belonging and community cohesiveness.</p>
<p>Opportunities</p> <p>O1 : The site is located in Xinyi District, Taipei; at the site area, external activity functions, including employment, administration, medicine, dining, and leisure are convenient, and there are good development conditions.</p> <p>O2 : The site is near a medical center, making access to medical services quite convenient.</p> <p>O3 : The site is near a school and a large public park, so leisure and cultural and educational living conditions are good.</p> <p>O4 : Thanks to holistic development and new construction, effective building and environmental quality management can be planned out in advance.</p> <p>O5 : Overall development and new construction allows Taiwan's current social trends and environmental needs to be taken into consideration, helping alleviate such social and environmental problems as demographic aging and long-term care, children's daycare, youth entrepreneurship, and other social needs. In addition, application of</p>	<p>Maxi-Maxi strategy (SO) Using strengths, taking advantage of opportunities</p> <p>SO1: S1, S3, O1, O5</p> <p>SO2: S3, S4, O4, O5</p> <p>SO3: S2, S3, S4, O2, O3, O5</p> <p>SO4: S2, O1, O3, O5</p> <p>SO5: S3, S4, O4, O5</p>	<p>Mini-Maxi strategy (WO) Overcoming weaknesses, grasping opportunities</p> <p>WO1: W1, O4, O5</p> <p>WO2: W2, O4, O5</p> <p>WO3: W3, O4, O5</p>

green buildings, intelligent buildings, green transportation, and ecological environment creation can meet environmental needs.		
<p>Threats</p> <p>T1 : The site is located in Taipei, which has a high level of economic development. However, compared with other regions, environmental quality conditions, such as the urban heat island effect, air quality and noise levels are poor, so improvement methods should be considered.</p> <p>T2 : Except for buses (which require walking some distance), the site is relatively far from the nearest MRT station and transfers are needed to go to most places; effective planning is needed to resolve the site's public transportation issues.</p> <p>T3 : Existing residents living near the site have misgivings about the development of the social housing; development strategies need to consider such matters as "proper management of social housing", "providing feedback to local residents", "increasing the use of neighborhood space", "architectural design", and other issues to reduce resistance from surrounding residents.</p>	<p>Maxi-Mini strategy (ST) Using strengths, avoiding threats</p> <p>ST1 : S2, S3, S4, T1, T3</p>	<p>Mini-Mini strategy (WT) Overcoming weaknesses, avoiding threats</p> <p>WT1 : W1, T2</p>

After assessing the strengths, weaknesses, opportunities, and threats connected with development of the study site, development strategies were analyzed as follows:

(1) Making good use of strengths, taking advantage of opportunities:

SO1: The site is located in Xinyi District, Taipei, and this location has good development conditions. The site consists largely of public land, which will entail lower development costs for the development of a social housing community, and the funds saved can be used to construct buildings and create a high-quality living environment. The fact that social housing is rented, and

not sold, will reduce the cost of housing and allow residents to enjoy a good quality of life in affordable homes.

SO2: Prospective residents who wish to enjoy a low-cost, high-quality residential community environment will need to sign comprehensive rental contracts, which will regulate their use behavior and encourage them to jointly maintain the buildings, safety, public welfare and environmental quality. The application of holistic development and new construction at the site can facilitate planning and ensure safety maintenance and management, and the presence of barrier-free spaces, etc., in advance, providing the community with a safe and comfortable environment.

SO3: The site is adjacent to a medical center, schools and parks. The medical, educational and leisure functions of the surrounding environment are good and community development can reserve certain areas for long-term care of the elderly, childcare and youth entrepreneurship functions, which will allow the community to play a role in the common development of the surrounding environment.

SO4: Because development of the social housing community will take place on a relatively large-scale and involve new construction, comprehensive planning to meet the public's living needs can be implemented, resulting in the establishment of a well-functioning, self-sufficient residential community. An effective community network will be established during early development, which will facilitate the sound maintenance and management mechanisms of a smart community, so that the community can form an integrated development area, which will be connected to the outside world by roads and network links, and achieve the goal of a livable city.

SO5: To achieve the goals of low cost and high living environment quality, the scale of development and new construction can ensure balanced economic development and maintain environmental quality, and a green economy can be fostered within the community in line with environmental protection considerations. Maintaining a high-quality living environment can reduce and ensure funds for follow-up maintenance and management, helping achieve the community's sustainable development.

(2) Overcoming weaknesses, grasping opportunities:

WO1: To address the site's relatively low road service level, the road system inside the site can be re-planned and developed comprehensively. In addition, green transportation can be employed to connect the site with the city's MRT transit system and form an effective transportation network, and various measures can be taken to resolve the transportation problems affecting the site.

WO2: With regard to the demolition of existing old buildings and disposal of construction waste, the effective classification and disposal of waste will facilitate holistic development. Waste with reuse value can be recovered, and other waste can also be classified on the basis of its materials, which will reduce the environmental load of building development and waste disposal and create economic value through waste recycling.

WO3: In order to promote resident participation in community development after the social housing is occupied, the management unit must assess the impact of the lease length and the fact that all residents will be tenants, and must consider promotional measures to encourage community residents to pitch in to maintain the quality of their living environment.

(3) Using strengths, avoiding threats:

ST1: Thanks to a certain scale of new construction, appropriate planning and design can be conducted to improve the quality of the site's living environment through the adoption of green buildings, smart buildings, and

ecological community practices. These measures can also improve the quality of the surrounding environment. In the course of planning, such aspects as providing feedback to local residents, increasing the common use of neighborhood space, and implementation of environmentally-friendly, attractive architectural design should be taken into consideration.

(4) Overcoming weaknesses, avoiding threats:

WT1: To address the site's low road service standards, applications can be made to re-route external public transportation systems, and green transportation can be employed to link the site with the MRT transit system, forming an effective transportation network and resolving the site's transportation problems.

3.3 Results and Discussion

Employing the content of community livability development defined in this study, the following conclusions and recommendations are submitted reflecting the results of SWOT analysis of social housing community livability development:

(1) Good economic development

By taking advantage of the site's superior life function and development advantages, and developing social housing that will be rented and not sold, the land's economic value and benefits can be used effectively, while taking into consideration social care aspects and reducing residents' living costs, and residents can enjoy affordable economic conditions, convenience and good quality of life. In addition, the effective classification and recycling of construction waste during the development process will create economic value from waste, which can not only offset the cost of waste disposal, but also reduce environmental load.

(2) Stable social security and welfare

Prospective residents who wish to enjoy a low-cost, high-quality residential community environment will need to sign comprehensive rental contracts, which will regulate their use behavior, and encourage them to jointly maintain the buildings, safety, public welfare and environmental quality. The application of holistic development and new construction at the site can facilitate planning and ensure safety maintenance and management, and the presence of barrier-free spaces, etc., in advance, providing the community with a safe and comfortable environment.

(3) Convenient and comprehensive life function

Because development of the social housing community will take place on a relatively large-scale and involve new construction, comprehensive planning to meet the public's living needs can be implemented, resulting in the establishment of a well-functioning, self-sufficient residential community. An effective community network can be established during early development, which will facilitate the sound maintenance and management mechanisms of a smart community, so that the community can form an integrated development area, which will be connected to the outside world by roads and network links, and achieve the goal of a livable city. To address the site's relatively low road service level, the road system inside the site can be re-planned and developed comprehensively. In addition, green transportation can be employed to connect the site with the city's MRT transit system and to form an effective transportation network, and various measures can be taken to resolve the transportation problems affecting the site.

(4) Adequate medical and educational resources

The site is adjacent to a medical center, schools, and parks. The medical, educational and leisure functions of the surrounding environment are good, and community development can reserve certain areas for long-term care of the elderly, childcare and youth entrepreneurship functions, which will allow the community to play a role in the common development of the surrounding environment.

(5) A good-quality living environment

The adoption of green buildings, smart buildings and ecological community planning and design practices will not only improve the quality of the site's living environment, but also promote economic development and environmental quality in the surrounding environment. During the planning stage, consideration should be given to such aspects as providing feedback to local residents, employing attractive architectural designs, and increasing common use of neighborhood space. At the same time, a green economy should be developed within the community. Maintaining a high-quality living environment can reduce and ensure funds for follow-up maintenance and management, helping achieve the community's sustainable development. Furthermore, the management unit must assess the impact of the lease length and the fact that all residents will be tenants, and must consider promotional measures to encourage community residents to pitch in to maintain the quality of their living environment.

The results of this study indicate that the five elements of a livable community correspond to the levels of Maslow's hierarchy of needs with the assessment of a livable city. Apart from ensuring social care and a cyclic supply of rental homes, planning of the internal environment in an effective social housing community development strategy should focus on a more appealing green environment, good transportation, and the promotion of management and social network linkage. In addition, with regard to economic considerations, construction waste should be handled properly, and effective maintenance and management performed. With regard to the external environmental, planning should focus on more convenient public transport connections, linkage with features and needs of the surrounding environment, and the establishment of friendly relations with nearby neighborhoods. These analysis results correspond to the "Eco-Community Evaluation System", which is based on the "eco-innovation" concept, and addresses the aspects of ecology, energy saving and waste reduction, health and amenities, service functions, categories and public safety ([Architecture and Building Research Institute, n.d.](#)). However, this system seems to lack the basic economic factors and considerations found in this study. The "eco-innovation" concept entails the development of economic processes responding to the needs of the community for environmental protection and sustainability, and seeks to provide innovative products and services with an environmental concept ([Carrillo-Hermosilla, del González, & Könnölä, 2009](#)). The government has drafted standards and measures in line with this concept as a basis for building and community development. However, as analysis shows, economic development is chiefly needed to meet the most basic physiological needs. While striving to achieve good environmental quality, a community should therefore also not ignore the impact of development on its economic load.

4 CONCLUSIONS AND SUGGESTIONS

Social housing can help regulate the housing market and solve the problem of urban residents being unable to buy their own homes. In addition, social

housing can reduce the cost of living, taking social care and the community as a whole into consideration while ensuring safety, health, good living conditions, convenient transportation, a friendly community, the natural ecology and other environmental quality aspects contributing to the livability of the community, while also encouraging residents to participate in community affairs, which will ensure effective maintenance and management, maintain a good quality of life and change the stereotyped view that public housing is undesirable and entails poor community living quality (Liao, 2012). This paper suggests a development strategy based on Taiwan's existing "Eco-Community Evaluation System", but incorporates economic factor considerations and employs an upgraded system more appropriate for practical applications. And while the "eco-innovation" concept focuses on environmental protection, it can also take both environmental and economic factors into consideration.

The "circular economy", which is currently much discussed and an issue of much importance for many countries, provides a model that can be applied to social housing community development. As explained by the [Ellen MacArthur Foundation \(2015\)](#), a circular economy is a cyclic economic model (involving reuse, reduction and recycling) that can replace the linear economic development model (involving taking, making, using and disposing) that has prevailed for a long time. "Eco-innovation" adds environmental protection and the concept of sustainability to economic development as a whole, creating a linear development model of green energy economic innovation, while circular economics can further regulate conflict between environmental protection and economic development, and establishes a multi-dimensional development model linking the behavior of government, producers and consumers in society as a whole. Bringing new business models and technologies into decentralized and traditional architectural domains ([Ellen MacArthur Foundation & McKinsey Center for Business and Environment, 2015](#)) can achieve livability and approach environmental sustainability more closely.

This paper focuses on the development of a social housing community on publicly-owned idle land in Taipei. As a consequence, the research scope and recommendations are applicable solely to Taipei City or similar cities. In addition, further research can examine how to apply the circular economy concept to the adjustment of development strategies.

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