

# The Landscaping of Urban Vacant Space – Taking Macau as an Example

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**Abstract:** With the acceleration of urbanization, the incongruity between urban construction and nature is becoming more and more prominent. The increasing population and the limitation of land use in Macau have become the main issues in urban development. There are still a number of vacant spaces that have not been developed and eventually wasted due to various reasons, affecting the overall image of the city and the health of the residents. Facing the dilemma of shortage of land resources, can the landscaping of vacant space provide a new direction for the development of urban greening? This paper investigates the current situation of the use of urban vacant space in Macau, combs and analyzes relevant literatures at home and abroad, as well as proposes solutions worthy of reference for the landscaping of vacant space, among which developing temporary landscapes in Macau is efficient and economical, in hope that more people will begin to pay attention to the rational use of vacant space and landscape development of these spaces in Macau.

**Keywords:** Vacant space; Temporary landscape; Macau

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## 1. Research status at home and abroad

### 1.1. Domestic

Urban vacant space refers to the land that has been approved for use but has been left unused or has not been developed within the time limit without any justification <sup>[1]</sup>. With the rapid development of economy and society, the speed of land development, urban renewal, and urban expansion has accelerated, and the number of urban vacant space has increased sharply. The existence of urban vacant space has a serious impact on the surrounding environment, so corresponding strategies must be taken to use these lands effectively <sup>[2]</sup>. How to design and layout urban vacant space as well as transform these vacant spaces into effective lands flexibly, so as to avoid the expansion of the vacant space area <sup>[3]</sup>? In response to the problem of urban vacant space, this paper expounds the definition of urban vacant space in detail: a huge landscape space that has not been fully utilized and the remaining space that has lost its original function or has been abandoned <sup>[4]</sup>. However, there are great differences between the cross-strait in the degree of legal perfection and construction.

Based on pertinent documents, Shanghai has promulgated the Temporary Measures of Shanghai Municipality for the Administration of Temporary Greening of Vacant Lands in August 2000, providing legal guarantee in managing urban vacant space. In order to solve the issue of vacant lands as a result of construction projects that are still under construction for many reasons, Tianjin has also issued the Regulations of Tianjin on Urban Greening, stipulating the period of vacant lands. Any land owner who violates the regulations shall be ordered to make corrections within a limited time, otherwise the relevant

departments shall supervise on his or her behalf, and the relevant maintenance expenses shall be borne by the land owner. With the implementation of this measure, vacant lands have been reasonably utilized under the protection of the law. Although China has begun to carry out investigations and research on the use of urban green space and urban vacant space, there is still a lack of practical experience and perfect system construction in terms of proposing solutions for the landscaping of other vacant spaces in the city.

## 1.2. Foreign

Compared with domestic research, foreign research on vacant space started earlier. Due to the accumulation of vacant space, the use of lands in the United States has changed from occupied lands to unused lands, resulting in vacant lands <sup>[5]</sup>. Although many industrial areas are shrinking rapidly, the population in some coastal cities is increasing. The reuse of vacant areas usually focuses on reconstruction, but it may be redirected to leisure, ecological, hydrological, and other non-traditional uses, creating a way of sustainability and ecological health.

Generally, the vacant space is managed by the parcel of land, and the solution of low economic return on investment is a reason for continuous idleness. Most vacant urban spaces tend to be relatively small, appear in bizarre plots, and found in areas with low development potential <sup>[6]</sup>. Vacant spaces also tend to reduce the development potential of adjacent areas. There are various forms of idle land, including abandoned houses, landfills, railway yards, industrial areas, military facilities, ports, parking lots, open spaces, transmission corridors, agricultural plots, and historical buildings <sup>[7]</sup>. If properly managed, vacant lands can become assets for rebuilding lost ecosystem services. Reprogramming these spaces in various forms includes converting unproductive business districts into park spaces, such as in Atlanta, Georgia, or urban gardens in abandoned areas, such as in Cleveland, Ohio, which has led Germany to implement various landscaping strategies. It has also put forward the “temporary” development and use strategy, which is reflected in the Green Belt Project in Leipzig, Germany <sup>[8]</sup>.

To sum up, in terms of the temporary use of vacant space, foreign countries have impeccable management systems, laws, and regulations, which flexibly meet the actual needs of local residents. Pertaining to rational utilization and transformation, China needs to establish a good legal system and consider the actual needs of the residents in the process of landscaping. This measure can address the current situation of insufficient urban landscape greening, promote the rational use of urban lands, and impart energy as well as vitality to urban construction.

## 2. Development status of urban green space in Macau

In Macau, a high-density city, it is particularly important to establish urban green spaces in the face of extreme population density. According to Macao’s Statistics and Census Service, in the third quarter of 2021, the total population of Macau reached 682,300, of which the population in Macau Peninsula accounted for 86.4%, but the per capita green area was only about 2 square meters; the population in Luhuan Island accounted for 1%, but the per capita green area was about 125.9 square meters <sup>[9]</sup>, showing an imbalance. Although the population in Macau Peninsula still shows a growing trend, there is very limited room for the development of green space. In the case of extreme shortage of land resources, the main issue discussed in this paper is on how to use vacant space to promote landscape greening.

According to relevant surveys, the 2017 report on vacant lands in Macau Peninsula pointed out that there are still 390 vacant lands in Macau Peninsula, and central district ranks first with 295 vacant lands, of which 162 lands are private and 79 lands are unknown. They do not only occupy urban lands, but also lead to serious health problems in the city. Therefore, improving the openness of public space, realizing regional function and value, adjusting the landscape function <sup>[10]</sup>, and reusing vacant spaces in urban areas reasonably, economically, and efficiently to increase urban green spaces are solutions to the problems of

urban greening and vacant lands in Macau. To some extent, these measures may alleviate people's bad impression of the city as a result of the lack of green landscapes.

### **3. Research on related concepts**

#### **3.1. Concept of vacant space**

Urban vacant space is an objective description of underused space in the city. It is vacant because of improper use, changed planning, or unrecognized importance, not because it has no use value. It is in a fuzzy and transitional state between being created and vacant <sup>[11]</sup>.

The concept of vacant space originated from *External Space Design* by Yoshinobu Ashihara in 1985. Vacant space can be divided into two concepts: the space converging from the surroundings to the interior of the building (which can also become a positive space for effective utilization), and the space diffusing from the center to the periphery of the building (passive space wasted by idleness) <sup>[12]</sup>.

In the theoretical research of vacant space, several scholars have proposed that vacant space is a state before it is disconnected from the social system (politics, economy, and culture) due to the changes in external forces, leading to the dissipation of its original function without a new function given. These spaces show a decadent and old state, and they are often temporarily occupied illegally before being officially used. At present, the research on idle space still emphasizes the unused nature of space and disregards the use value of space.

#### **3.2. Causes and classification of vacant space**

The causes of idle space can be divided into the following two types: government factors and individual enterprise factors. Government factors are mainly due to omissions in the planning process. This is because there is no real-time demolition during land transfer, or the subsequent demolition is ineffective. In Macau, most of the idle lands are privately owned, and the reason for that is the lack of funds or for the purpose of land hoarding for profit <sup>[13]</sup>.

Many scholars have investigated the current situation of vacant space and have divided it into several types: industrial sites, unidentified type, undeveloped type, and idle type. Among them, the space quality of industrial sites is poor due to non-degradable substances and pollutants; the unrecognized type is formed due to building quality and load capacity; the undeveloped type is formed due to property rights and compound factors; the idle type is formed due to newer urban functions and other factors. The last three types have relatively good space quality.

#### **3.3. Necessity of vacant space landscaping**

Urban vacant space is not conducive to the image development of a city. The lack of urban landscape engenders a lack of vitality and aura from the whole city. Therefore, it is feasible and necessary to make rational use of urban vacant space for urban landscape.

##### **3.3.1. Promotes sustainable development of resources**

To some extent, vacant space transformation via landscape management can enhance the vitality of a city and the competitiveness of tourism, improve the use value of the overall social space, increase the level of happiness of the residents, build an ecological environment, and promote the sustainable development of the city.

##### **3.3.2. Improves environmental quality**

Due to the long-term lack of management of vacant space, internal deterioration occurs, turning the space into a waste storage yard or a waste accumulation place. The proliferation of germs over a long period of

time will not only blemish the image of the city, but also endanger the safety of the residents. Therefore, through the transformation of vacant space via landscape management, it is possible to improve the value of urban vacant space, beautify the urban environment, and prevent the breeding of harmful pathogens to a certain extent while providing residents with a space for rest and communication.

### **3.3.3. Protects history and culture**

As a tourist city, Macau has a strong historical flavor and cultural heritage. These forgotten vacant spaces also retain the imprint of the city. Hence, they are not worthless. By reusing these vacant spaces, protecting and improving the regional ecological environment, forming a microclimate environment, optimizing the environment, as well as retaining the imprint of the times are within reach.

## **4. Temporary landscapes – A landscaping strategy for the vacant space in Macau**

At present, China's research on the solution to the problem of vacant space is still in the period of preliminary development. Juan Luo, a renowned scholar, proposed that from the perspective of ecology and economy, planting green plants, such as having lawns and shrubs, in vacant space is a solution <sup>[14]</sup>. However, due to the shortage of land resources and the small area of vacant space in Macau, this method has low adaptability and utilization. Maximizing the use of green landscape in vacant space while providing a place for leisure and entertainment is an issue that needs to be considered in the utilization of vacant space in Macau.

As most of the vacant spaces in Macau are privately-owned lands, temporary landscape emphasizes on the concept of "tour" from its design to implementation, changes, demolition, and reuse. Temporary landscapes are movable, detachable, and can be combined arbitrarily. The principal feature of temporary landscapes is the short use time <sup>[15]</sup>. In designing temporary landscapes, bold and innovative materials can be used, characteristic cultural concepts can be introduced, and landscapes with small limitations, high flexibility, and low cost can be created. Temporary landscape does not only solve the problem of vacant land and the waste of space, but also provide a new space for urban greening, which will effectively change the urban landscape environment. It will not destroy or pollute the site, nor will it affect the secondary use of the site.

The design of temporary green space is not the only method but rather, one of the solutions suitable for vacant space. It needs to be economical and effective in its design. It does not only improve the utilization rate of urban land, but also purify the environment. Through its reasonable design and use, it can create a distinctive and positive public environment atmosphere, improve the vitality of the city, and enhance the participation of the residents, thus improving their level of happiness.

## **5. Conclusion**

Rapid urban renewal and development result in the problem of vacant lands. Especially in Macao, its population density is too high, its land resources are tight, and there is almost no space for the development of urban landscape. Taking Macau as an example, this paper studies the landscaping of vacant space at home and abroad and proposes a temporary landscape design with low investment and high efficiency, so as to ensure that these vacant spaces radiate new vitality, enhance social value, realize the maximum utilization of resources, and bring new opportunities for the construction and development of high-density urban environment. However, it is not only restricted to one way of landscaping; therefore, it is vital to select appropriately to promote the sustainable construction and development of high-density urban environment.

## Disclosure statement

The author declares no conflict of interest.

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