

# Analysis on the Development Plan of Zhuhai's Uninhabited Islands Based on the Concept of Healthcare Tourism

## Taking the Zhuhai Triangle Island as an Example

Yanxia Liu<sup>1</sup> Huanjie Lin<sup>2</sup> Lin Shi<sup>3</sup>

<sup>1,2</sup> School of Tourism, Zhuhai College of Science and Technology, Zhuhai, Guangdong 519041, China

<sup>1,3</sup> School of Marxism, Changchun University of Technology, Changchun, Jinlin, China

<sup>3</sup> School of Marxism, Beijing Institute of Technology, Zhuhai, Zhuhai, Guangdong, China

<sup>3</sup>Corresponding author.

### ABSTRACT

This article conducts research from four aspects: basic understanding of uninhabited island planning, implementation approaches based on the concept of healthcare tourism in uninhabited island planning, development analysis, and planning strategies. Through analyzing the development background and resources of healthcare tourism in case studies, this article proposes to adhere to the "public welfare plus tourism" model and develop healthcare tourism based on cultural activities, as well as planning strategies for healthcare ecology, healthcare culture, healthcare industry, healthcare publicity, and healthcare talents, in order to provide reference for the development planning of uninhabited islands in Zhuhai.

**Keywords:** Healthcare tourism, Island tourism, Uninhabited islands, Development planning, Zhuhai Triangle Island.

## 1. INTRODUCTION

The public, who have experienced the COVID-19, have generally improved their health awareness. Therefore, healthcare tourism becomes popular. As China's aging process accelerates, the consumption capacity of the elderly population is also improving. The increasing demand for healthcare tourism in the elderly tourist market will provide sufficient customer sources for the development of healthcare tourism in Guangdong Province.

Zhuhai is rich in marine resources, with vast sea areas and numerous islands. Island tourism is the future development direction of tourism in Zhuhai. Triangle Island (promotion name: Changqin Island) belongs to the jurisdiction of Guishan Town, Wanshan District, Zhuhai. It is located in the geometric center of the Guangdong-Hong Kong-Macao Greater Bay Area, adjacent to Zhuhai Jiuzhou Port and Shenzhen Shekou Port, and has a large customer base for health care in the Guangdong-Hong Kong-Macao Greater Bay Area.

## 2. BASIC UNDERSTANDING OF UNINHABITED ISLAND PLANNING

Uninhabited islands refer to an island within the waters under the jurisdiction of China that do not have a permanent household registration, are not inhabited by residents, and are under the actual jurisdiction and development of China. The uninhabited island planning refers to the scientific and rational planning and management of uninhabited islands and their surrounding waters to achieve their sustainable development goals.

### 2.1 Objectives of Uninhabited Island Planning

Due to its unique geographical location, scarce freshwater resources, and small area of most uninhabited islands, the ecosystem of uninhabited islands relatively fragile. In order to establish an efficient and comprehensive management system

for uninhabited islands and achieve effective protection and sustainable utilization of uninhabited island resources, the development of uninhabited islands requires scientific and reasonable planning.

## ***2.2 Characteristics of Uninhabited Island Planning***

As an important component of China's marine resources, uninhabited islands have special and complex planning and management characteristics. In order to achieve sustainable development of uninhabited islands, there is a must to fully understand and master their planning characteristics.

### ***2.2.1 Regional Differences***

In terms of the planning system for uninhabited islands, China generally maintains three levels of planning, namely national planning, regional planning, and local planning. Due to the wide distribution of uninhabited islands in China and significant regional differences, local planning directly constrains development and utilization activities.

### ***2.2.2 Policy Guidance***

The national economic and social development planning system can be divided into overall planning, special planning, and regional planning. Policy documents such as national economic and social development plans are prerequisites and conditions for the planning of uninhabited islands. The planning of uninhabited islands is a special plan aimed at the development and protection of uninhabited islands, and is a refinement of policy documents such as national economic and social development plans in the domain of uninhabited islands.

### ***2.2.3 System Supervision***

The characteristics of uninhabited islands determine that the planning of uninhabited islands is subject to supervision from multiple fields and management departments. According to the "Regulations on the Protection of Islands in the Zhuhai Special Economic Zone", the utilization and protection of islands in the Zhuhai sea area are supervised and managed by the municipal marine administrative department, ecological environment administrative department, fisheries and other administrative departments. [1]

## ***2.3 Concepts to Be Followed in the Uninhabited Islands Planning***

Uninhabited islands have characteristics such as poor ecological stability and environmental carrying capacity. Once the island's ecosystem fails, it is highly likely to have a destructive impact on the entire marine ecological environment. Therefore, the planning of uninhabited islands should follow the concept of sustainable development, and adopt a protective development approach. In the planning, it is also necessary to establish an ecosystem health assessment mechanism, and prevent serious consequences such as ecological pollution and environmental damage.

## ***2.4 Methods and Basic Ideas for Uninhabited Island Planning***

In order to better manage and utilize the precious resources of uninhabited islands, it is necessary to understand the current situation and resource situation of uninhabited islands, develop scientific and reasonable planning schemes, and strengthen supervision and management. Therefore, the planning of uninhabited islands is a complex and important task that requires scientific methods and approaches.

### ***2.4.1 Methods for Uninhabited Island Planning***

The method of uninhabited island planning is to classify, regulate, and guide the functions of uninhabited islands. The core is the functional selection of uninhabited islands. Due to the diversity and complexity of uninhabited island resources, their functional selection also has multiple possibilities. Therefore, uninhabited island planning should not be limited to past development experience, but make the highest value functional selection based on objective conditions and social attributes.

### ***2.4.2 Basic Ideas for Uninhabited Island Planning***

The first is the protection priority. Uninhabited islands are an important part of marine resources, and once damaged, they are difficult to recover, which can also bring serious natural environment degradation and economic losses. Therefore, the planning of uninhabited islands should follow the basic idea of prioritizing protection.

The second is the classification management. The uninhabited island planning should be classified and managed based on the natural and social attributes of islands. To construct a classification system for uninhabited islands, it is necessary to consider the carrying capacity of resources and environment, as well as its functions and compatibility, in order to meet the regulatory authorities' protection and utilization planning needs for uninhabited islands and meet market demand. [3]

The third is the moderate utilization. The uninhabited islands should be scientifically and reasonably planned based on the resource conditions of uninhabited islands under the premise of classified management. And targeted and moderate development should be carried out according to different categories of uninhabited islands.

### **2.5 Main Contents of Uninhabited Island Planning**

The main content of uninhabited island planning includes the definition of uninhabited islands, clarifying the planned objects, classifying based on the actual situation of uninhabited islands, and analyzing applicable protection and development methods in conjunction with economic and social development plans, as well as following the basic concepts, ideas, principles, and goals of the plan, determining the functional use of uninhabited islands based on the classification criteria for island functions, and developing scientific and reasonable development strategies.

## **3. THE IMPLEMENTATION APPROACH OF HEALTHCARE TOURISM CONCEPT IN THE UNINHABITED ISLAND PLANNING**

With people's pursuit of health and leisure, healthcare tourism has become an emerging form of tourism. As an important part of tourism resources, uninhabited islands have unique advantages. How to integrate the concept of healthcare tourism into the planning of uninhabited islands and achieve their sustainable development is a problem that needs to be considered.

### **3.1 Site Selection for Uninhabited Islands Based on the Concept of Healthcare Tourism**

Healthcare tourism is a health and wellness tourism activity that relies on natural and cultural tourism resources. The unique natural and cultural resources have a high attraction to the customer group of healthcare tourism. Therefore, the site selection of uninhabited islands for the development of healthcare tourism needs to fully consider the conditions of natural tourism resources and cultural tourism resources. The demand for healthcare tourism market and policy support are also stimulating factors that attract enterprises to participate in the bidding for the transfer of the right to use uninhabited islands.

### **3.2 Integration of Uninhabited Island Healthcare Tourism Resources**

With the continuous development of the economy and society, the tourism demand of tourists is not only limited to leisure sightseeing, but also to cultivate their physical and mental health and broaden their horizons. Therefore, in healthcare tourism, it is necessary to strengthen the organic combination of cultural resources and healthcare tourism resources to achieve reasonable resource allocation and meet the needs of tourists at different levels.

### **3.3 Theme Positioning of Uninhabited Islands Based on the Concept of Healthcare Tourism**

Uninhabited islands should be based on the advantageous resources and social attributes of developing healthcare tourism, clarify the theme positioning, and fully leverage the advantages of healthcare tourism resources. Taking Bali as an example, it is known as the "Island of Art", showcasing its ethnic and religious characteristics through various forms such as architectural art and street landscape sketches, making it a world-renowned island tourist destination.

### **3.4 Planning Strategies for Uninhabited Islands Based on the Concept of Healthcare Tourism**

At present, large healthcare resorts have high similarity in positioning and construction direction, and there is severe homogenization competition. Therefore, the planning of uninhabited island

healthcare tourism should adhere to the "one island, one style" strategy, and fully reflect the island characteristics to improve competitiveness. Taking Maldives as an example, special attention is paid to island planning during the development process, including single island planning and overall planning of the archipelago, achieving a one island, one style.

### ***3.5 Planning and Layout of Uninhabited Islands Based on the Concept of Healthcare Tourism***

The ecology of uninhabited islands is fragile and most of them are small, with limited tourism space available for development and utilization. A reasonable layout of tourism space is a basic requirement for carrying out tourism activities. Uninhabited islands should reasonably divide their tourism spatial layout based on their functional positioning and ecological carrying capacity, and pay attention to the coordination and unity of ecological carrying capacity and tourism capacity.

## **4. ANALYSIS OF THE DEVELOPMENT OF ZHUHAI TRIANGLE ISLAND BASED ON THE CONCEPT OF HEALTHCARE TOURISM**

With the rise of healthcare tourism, Zhuhai Triangle Island has gradually become the focus of attention for tourists. Healthcare tourism is a tourism method that emphasizes physical and mental health and tourism quality, which is different from traditional sightseeing tourism. How to integrate the concept of health tourism into the planning and development of Zhuhai Triangle Island to achieve its sustainable development is a problem that need to be

### ***4.1 Overview of Zhuhai Triangle Island***

Zhuhai Triangle Island is located in the northwest of the Wanshan Islands in the eastern sea area of Zhuhai City, Guangdong Province. It is a beautiful island with unique natural environment and tourism resources.

#### ***4.1.1 Basic Situation of Zhuhai Triangle Island***

Triangle Island, under the jurisdiction of Zhuhai Wanshan Marine Development Pilot Zone, is an uninhabited island. The Triangle Island covers an

area of 0.87 square kilometers and is the first "public welfare + tourism" uninhabited island development project in China, the first real estate registration uninhabited island in China, the first application project of local uninhabited island construction regulations in China, and the first ecological restoration project to develop an uninhabited island as a whole.

This island is located in the central area of Hong Kong, Macau, and Zhuhai, approximately 9 nautical miles northwest of Kyushu Port, with a flight distance of about 30 minutes, only 6.5 nautical miles from Macau, 16.5 nautical miles from Hong Kong Airport, and approximately 22 nautical miles from Shenzhen. Its geographical location is superior. According to the list of islands released by the state, the island type of Zhuhai Triangle Island is for tourism and transportation, and the island capacity control standard is 65%.

#### ***4.1.2 Protection and Development Status of Zhuhai Triangle Island***

In the 1980s and 1990s, the ecological environment of the Triangle Island was severely damaged, making it difficult to rely on natural resources to develop tourism. However, after a series of ecological restoration, achievements have been made in restoring 50,000 square meters of slopes, 100,000 square meters of bare land, and 41,400 square meters of beaches.

As a tourism and transportation island, Triangle Island has completed the construction of marine monitoring centers, beach commercial streets, desalination plants, fire centers, tent hotels, and other buildings. At the same time, supporting facilities such as detached vacation apartments and music halls are under construction. The scale index of the island has reached 59.39%, and it is already in a critical overload state. [4]

### ***4.2 Background and Analysis of Healthcare Tourism Development in Zhuhai Triangle Island***

On the coastline of southern China, a brilliant pearl is gradually emerging - this is the Zhuhai Triangle Island. It is a treasure bestowed by nature, with beautiful beaches and clear seawater. In this era of diversification, the integration of different industries has also injected new vitality into the healthcare tourism of Triangle Island.

#### *4.2.1 Market Background for the Development of Healthcare Tourism in Zhuhai Triangle Island*

China has a large elderly population and a rapid aging process, with particularly severe aging in Hong Kong and Macao and limited resources. There is a large demand for healthcare tourism in the market. Triangle Island is located in the heart of Hong Kong, Macau, and Zhuhai, with a superior geographical location and a large customer base for health care in the Guangdong-Hong Kong-Macao Greater Bay Area.

#### *4.2.2 Policy Background for the Development of Healthcare Tourism in Zhuhai Triangle Island*

The first is the national policy support. The national "14th Five Year Plan" proposes to adhere to land and sea coordination, accelerate the construction of a maritime power, and provide policy support for the tourism development of the Triangle Island. Since 2015, a series of policy documents such as the "National Healthcare Tourism Demonstration Base Standards" and the "'Healthy China 2030' Planning Outline" have supported and guided the development of health and elderly care undertakings, providing a good policy environment for the development of healthcare tourism in the Triangle Island.

The second is the regional policy support. In recent years, Zhuhai has attached great importance to the development of the healthcare tourism industry and vigorously promoted the development of island leisure and health tourism. Zhuhai City is located in one of the core locations of the Greater Bay Area, and the development of island healthcare tourism has great policy support.

#### *4.2.3 Resource Background of Healthcare Tourism Development in Zhuhai Triangle Island*

The most advantageous natural tourism resource in Zhuhai is island resources, which have a strong attraction for tourists. The unique ecological restoration scenery, artistic atmosphere filled music and cultural activities, and novel leisure activities of this island are important foundations for the development of healthcare tourism.

### **4.3 Analysis of Healthcare Resources in Zhuhai Triangle Island**

Zhuhai Triangle Island is a unique healthcare tourism destination, with abundant natural resources and superior geographical location providing a solid foundation for the development of healthcare tourism.

#### *4.3.1 Natural Conditions*

The number of days that the annual Air Quality Index (AQI) meets the standard is  $\geq 80\%$ , which is an important factor in determining whether it is suitable for developing healthcare tourism. According to the 2022 National Environmental Air Quality Report released by the Ministry of Ecology and Environment, Zhuhai ranks 13th out of 168 major cities in China, with an AQI compliance rate of 89.9% in the city. Overall, the air quality ranks third in the Pearl River Delta. It can be seen that the air quality in Zhuhai is excellent and suitable for the development of healthcare tourism.

The Zhuhai Triangle Island not only has fresh air, but also has high-quality island healthcare tourism resources 5S such as sun, sand, sea, seafood, and sky. As the first ecological restoration theme in the country, this island is developed as an uninhabited island. The unique ecological restoration scenery provides great visual enjoyment, and the quiet and private environment is more conducive to releasing stress and depression, thus playing a role in health preservation and disease prevention.

#### *4.3.2 Humanistic Conditions*

The inherent lack of humanistic resources in the Triangle Island makes it difficult to develop tourism based on cultural heritage. However, in the context of major policies such as maritime power and coordinated cooperation between the Pearl River and Macao, the Triangle Island focuses on the theme of international music and leisure islands, and the rich and diverse music and cultural activities create a humanistic and immersive artistic atmosphere throughout the island. Various music and cultural themed activities such as samba parties, full moon parties, and candlelight concerts provide assistance for the development of healthcare tourism in the Triangle Island.

### 4.3.3 Leisure Sports

Sports, leisure, and healthcare tourism are the preferred and leading industries for contemporary healthy living. This island has a complete set of functions such as water sports, diving, and outdoor expansion, with electric surfboards, motorboats, kayaking, sailing, and other sports, providing suitable and novel entertainment experiences for sports, leisure, and healthcare professionals.

## 5. PLANNING STRATEGY FOR ZHUHAI TRIANGLE ISLAND BASED ON THE CONCEPT OF HEALTHCARE TOURISM

Against the backdrop of increasing attention to healthcare tourism, Zhuhai Triangle Island has become a popular destination for healthcare tourism due to its unique natural resources and superior geographical location. In order to better meet the needs of tourists and enhance the tourism quality and attractiveness of the Triangle Island, the following planning strategies are proposed.

### 5.1 Development Ideas for Zhuhai Triangle Island Based on the Concept of Healthcare Tourism

The development strategy of healthcare tourism in Zhuhai Triangle Island should be led by innovation, guided by market demand, based on ecological protection, supported by cultural inheritance, and guaranteed by service quality, in order to comprehensively enhance the quality and attractiveness of healthcare tourism in the Triangle Island.

#### 5.1.1 Adhering to the "Public Welfare + Tourism" Model

According to the requirements of the "Zhuhai Triangle Island Protection and Utilization Plan", the overall development of the island is carried out based on the principle of "public welfare first, ecological priority". The public welfare island area of Triangle Island is 0.26 square kilometers, and the tourism island area is 0.61 square kilometers. The development and utilization of Triangle Island should prioritize public welfare and ecology over development and utilization, and minimize the damage to the ecological environment caused by tourism activities.

### 5.1.2 Developing Healthcare Tourism Based on Cultural Activities

A high-quality ecological environment and favorable climate conditions are only the foundation for the development of healthcare tourism, and unique cultural connotations are the core competitiveness of the development of healthcare tourism. Healthcare tourism products can be divided into low, medium, and high-end tourism products, corresponding to "eye nourishing" tourism basic products, "health nourishing" leisure key products, and "heart nourishing" cultural characteristic products. [5] The natural resource advantages of Triangle Island are not prominent, so the development of Triangle Island healthcare tourism needs to rely on unique music and cultural activities, and deeply explore "heart nourishing" music and cultural healthcare products.

## 5.2 Planning Strategies for Zhuhai Triangle Island Based on the Concept of Healthcare Tourism

In order to better meet the needs of tourists and enhance the tourism quality and attractiveness of the Triangle Island, it is necessary to develop effective planning strategies under the guidance of the concept of healthcare tourism.

### 5.2.1 Healthcare Ecological Strategies

A good ecological environment and climatic conditions are prerequisites for the development of healthcare tourism. Triangle Island, like the Maldives, follows the principle of "three low and one high", which includes low-rise buildings, low-density development, low capacity utilization, and high greening rate. The buildings do not exceed six floors, and the island's capacity is strictly controlled to not exceed 65%. It is necessary to continue to promote the restoration of bare land and create an ecologically harmonious island healthcare tourism destination.

#### 5.2.1.1 Visual Healthcare Environment

According to research by the World Health Organization, the environment plays an extremely important role in health. The independent and beautiful island environment can relax people's mood, and the island's plant morphology and rolling mountain lines can visually make people feel comfortable and release pressure. Therefore,

the Triangular Island can be transformed through mountain and forest lines, with a plant community level mainly composed of a composite structure of trees, shrubs, and grasses, forming a richer visual perception, thereby alleviating the fatigue of healthcare seekers.

#### 5.2.1.2 Olfactory Healthcare Environment

Olfactory healthcare refers to smelling negative ions in the air and various plant aromas through the nose, which creates a sense of pleasure and has a healthcare effect. The concentration of negative ions in the air plays a promoting role in human health, and the fragrant or fragrant smell can refresh and alleviate anxiety, with good healthcare effects. This island can choose plants that are suitable for planting on the island and have healthcare benefits, providing healthcare seekers with an olfactory healthcare environment rich in plant volatile fragrances.

#### 5.2.1.3 Tactile Healthcare Environment

Direct contact with plants, beaches, and seawater on islands is not only beneficial for enhancing tactile sensitivity, but also for relieving stress and achieving good healthcare outcomes. Teak wood has rich texture and texture, and emits a natural fragrance. Its volatile components are beneficial to human health and are suitable for growing on triangular islands. This island can choose to plant teak trees and other methods to provide a rich tactile experience for healthcare seekers, ensuring the effectiveness of tactile healthcare.

#### 5.2.1.4 Gustatory Healthcare Environment

The drinking water of Triangle Island mostly uses lake water and seawater desalination water on the island, which has the characteristics of clean water quality and high purity, and can meet the drinking water needs of healthcare seekers. The surrounding waters of Triangle Island are rich in seafood such as hairy crabs and mussel, which have the effect of nourishing the body. Therefore, this island needs to develop personalized nutritional catering and dietary plans, providing fresh and original seafood ingredients to promote the healthy taste of healthcare seekers back to a healthy state.

#### 5.2.1.5 Auditory Healthcare Environment

On the Triangle Island, the developers can add scale wooden barrels, bamboo tubes, wooden wind

chimes and other devices throughout the island to play music such as guqin and songbo, creating a soothing natural sound and beautiful healing sound. Due to the fact that some areas of the Triangle Island are still in the development and construction period, construction noise is prone to occur. Therefore, the Triangle Island needs to monitor the noise level in real time to avoid causing discomfort to the healthcare seekers and affecting the healthcare effect.

#### 5.2.2 Healthcare Culture Strategies

Although Triangle Island has the basic conditions suitable for the development of healthcare tourism, it only stays in the traditional island healthcare tourism, healthcare meals, and healthcare sports, without integrating with the main music culture of Triangle Island. The competitiveness of healthcare characteristics cannot support the development of the island.

Numerous facts have proven that music can have a subtle impact on people's physical and mental health, with aesthetic, entertainment, and therapeutic effects. [6] On the Triangle Island, the developers can build a music therapy room, equipped with music relaxation chairs and other equipment, and hire professional music therapists to provide music therapy. They can also offer various types of healthcare products to tourists through activities such as health yoga, health meditation, and leisure fishing.

#### 5.2.3 Healthcare Industry Strategy

Health Industry Zhuhai has abundant medical resources, with 4 tertiary hospitals, as well as health base hospitals and medical research bases, and a complete medical and health system. However, Triangle Island has failed to take advantage of the medical resource advantages of Zhuhai City, and the supply of supporting facilities for healthcare tourism is insufficient. For the Triangle Island, it is necessary to integrate recuperation resources, establish cooperation with large brand medical institutions, and provide tourists with diverse healthcare tourism products.

Cultural and Tourism Real Estate Industry At present, the supporting infrastructure for healthcare in Triangle Island is limited, and there is no healthcare themed hotel. On the Triangle Island, the developers can build vacation apartments with a healthcare theme, providing healthcare services

such as seawater baths and SPAs, meditation guidance, and psychotherapy.

Due to the huge investment in ecological restoration projects in the early stage, the transfer of real estate in the Triangle Island can to some extent alleviate the pressure on the development, construction, and investment funds of the island users. However, the combination of tourism and real estate can easily fall into the inherent pattern of the real estate industry, neglecting that the key to the success of the tourism industry lies in services. For the Triangle Island, there is a necessity to shift from traditional construction and marketing to operation and service, attach importance to content operation, and improve service quality.

#### 5.2.4 *Healthcare Publicity Strategies*

The publicity of the Triangle Island is mostly concentrated on the official account and video number of Jiuzhou Group. The audience is limited, the effect of publicity and marketing is not obvious, and the image of the Triangle Island music leisure island has not been created. The popularity is far lower than other islands such as Wailingding Island and Dong'ao Island. The publicity of Triangle Island should broaden the channels and platforms of tourism destination promotion through multimedia, organically integrate image marketing methods with product promotion methods, and integrate the cultural, historical, landscape and other characteristics of tourist attractions to create a distinct and creative image.

#### 5.2.5 *Healthcare Talent Strategies*

Compared to traditional tourism, healthcare tourism requires higher professional skills and knowledge from practitioners. There is a shortage of healthcare professionals and an imperfect service system in China. The island is far from the land, and employees on the island will face a situation of being far away from their relatives and friends. Therefore, the employee turnover rate on the island is much higher than on the land, making it more difficult to attract high-quality healthcare professionals. Triangle Island should seize the opportunity of policy support in Zhuhai and actively introduce healthcare tourism professionals.

## 6. CONCLUSION

Island tourism is the future development direction of tourism in Zhuhai, and the development of island healthcare tourism will be a

hot field in the tourism development market of Zhuhai. Triangle Island should be based on market demand, rely on natural and cultural resources, and create a rich and diverse healthcare environment through healthcare ecology, culture, industry, publicity, and talent strategies, in order to become a new benchmark for the high-quality development of island healthcare tourism.

## REFERENCES

- [1] Standing Committee of the Zhuhai Municipal People's Congress. Regulations on the Protection of Islands in the Sea Area of the Zhuhai Special Economic Zone [N/OL]. Zhuhai Special Zone News, 2019-01-17 (04). [http://zhuhaidaily.hizh.cn/html/2019-01/17/content\\_149237\\_898236.htm](http://zhuhaidaily.hizh.cn/html/2019-01/17/content_149237_898236.htm). (in Chinese)
- [2] Song Weier, Study of Uninhabited Island Planning in Zhejiang based on Space Management and Control Mechanism [D]. Zhejiang University, 2015. (in Chinese)
- [3] Yang Lei, Nong Yun, Yang Zhengping, A Study on the Classification and Evaluation Index System of Uninhabited Islands in Zhuhai City under the Market Participation Mechanism [C]// China Urban Planning Society, Chengdu Municipal People's Government. Spatial Governance for High Quality Development - Proceedings of the 2021 China Urban Planning Annual Conference (11 Urban Rural Governance and Policy Research), China Architecture & Building Press, 2021: 750-759. DOI:10.26914/c.cnkihy.2021.028591. (in Chinese)
- [4] Yang Lei, Zhao Yang, Wang Wei, Xu Jinhua, Nong Yun, Quantitative Control on the Development and Utilization of Uninhabited Islands:A Study on the Exploitable Islands in Zhuhai [J]. Planners, 2022, 38(05): 76-83. (in Chinese)
- [5] Yang Huimin, Air Anion and Forest Health [J]. Shanxi Forestry Science and Technology, 2022, 51(S1): 74-75. DOI:10.19989/j.cnki.1007-726X.2022S136. (in Chinese)
- [6] Li Xinghu, Study on the Influence of Music and Human Body and Mind Health [D]. Hebei University, 2017. (in Chinese)



- [7] Li Jiyong, Weng Zili, Chen Wei, A Study on the Development and Construction Strategies of Non resident Islands from the Perspective of Real Estate Registration: A Case Study of Triangle Island in Zhuhai City [J]. Symposium of "Planners", 2022(00): 315-321. (in Chinese)