

Research on the Development and Innovation of Heyuan Hot Spring Tourism Resources under the View of "Hot Spring+"

Wu Xinlei^{1,a}

¹Heyuan Polytechnic, Faculty of Business Administration, Heyuan Polytechnic, Heyuan, Guangdong, China

^a 122088778@qq.com

Abstract. Hot spring resource is not only a kind of renewable clean energy, but also a kind of exploitable tourism resource with high value. With the integration of hot spring tourism and agriculture, forestry, culture, sports and other industries, the development of "hot spring" multi-industry chain is conducive to the effective development of hot spring resources and the sustainable development of hot spring tourism. Heyuan is one of the prefectures with the most abundant hot spring resources in Guangdong Province, which has the reputation of "hot spring capital". Based on the view of multi-industry integration of "hot spring", this paper analyzes the development and management status of five representative hot spring resources in Heyuan. At the same time, this paper discusses the sustainable development mode of Heyuan hot spring resources under the background of "Hot Spring+".

1.A brief introduction of Water Resources in Heyuan Hot Springs

Heyuan City is located at the junction of the mountainous area of northeast Guangdong Province and the plain of the Pearl River Delta. It has jurisdiction over Yuancheng District, Jiangdong New District, Dongyuan County, Heping County, Longchuan County, Zijin County, Lianping County, 53% of which belong to mountainous hilly land forms. Heyuan has a long history of Hakka culture, superior ecological environment and rich natural resources. Dongjiang and Xinfeng River runs through the city. Heyuan has "Gold (mineral resources), Wood (forest resources), Water (water resources), Fire (hot spring resources), Soil (land resources)" five elements, which is important ecological barriers and drinking water sources in Guangdong Province. Heyuan is known as the "treasure house of eastern Guangdong". The per capita mineral, land, forest and water resources in Heyuan ranks first in Guangdong Province.

Heyuan City is rich in geothermal resources, and 35 hot spring resources have been proved to be exploitable. A total annual discharge of $511.9 \times 10^4 \text{ m}^3$ mainly distributed in Yuancheng District, Dongyuan County, Heping County, Zijin County and Longchuan County [1]. The geothermal resources exposed from the surface of Heyuan area mostly belong to the medium and low temperature ($35^\circ\text{C} \leq t \leq 90^\circ\text{C}$) structure fissure type confined water geothermal resources, all of which are self-flowing hot spring water, easy to exploit and low in cost [2].



Table 1. Classification of types and quantities of hot springs in Heyuan.

Hot spring water temperature	25°C~40°C	40°C~60°C	60°C~90°C	90°C~150°C
Type of Hot spring	Warm water hot spring	Warm hot water hot spring	Hot water hot spring	Medium-temperature geothermal spring
Number of hot springs	6	11	17	1

Heyuan hot spring is crystal clear, water quality is good, water temperature is high, water quantity is large, and average geothermal water resources is 4012m³/ day. Nearly 10 comprehensive hot spring resorts were built. Heyuan hot spring tourist destinations all have unique characteristics of hot spring water resources, such as "radon spring" in the International Tourist Resort of Crystal Hot Spring, "Chinese medicine spring" in Bavaria manor, "soda spring" in Yeyuan Hot Spring Resort, "sulfur spring" in the Royal Linmen Hot Spring Resort, "metasilicic acid spring" in Relong Hot Spring Resort.

Table 2. Comparison of hot spring water quality of 4A class hot spring scenic spots in Heyuan.

Name of Hot spring tourist destination	Grade of scenic spot	Daily flow /m ³	Maximum water temperature/°C	Water quality & characteristics	Water quality & effect
Heyuan Zijin Royal Linmen Hot Spring Resort	AAAA	8000-10000	86	Water quality is sodium bicarbonate type, salinity is 435-513 / L, belongs to light hot spring, metasilicic acid concentration 120-129mg / L, fluorine content 13.33-14.7 mg / L, it is medically available silicon water, fluorine water, slightly sulfur smell.	It has the auxiliary medical function on obesity, skin diseases
Heyuan Peace Relong Hot Spring Resort	AAAA	6000	88	Water quality is alkaline, PH value is 7.42, rich in more than 60 beneficial trace mineral elements, including metasilicic acid, fluorine, radon content exceed the national standard for the naming of medical hot mineral water.	It can prevent and cure rheumatoid arthritis, muscle strain and other diseases.
Heyuan Ye Yuan Hot Spring Resort	AAAA	6000	68	Water contains many kinds of minerals and trace elements which are beneficial to human body, especially the content of alkali is the highest.	Beauty and health care function
Heyuan the World crystal hot spring international tourist resort	AAAA	10000	48-63	It contains more than 40 beneficial trace elements, radon 148bp / L, bicarbonate at 690mg / L, sodium ion at 225mg / L, salinity at 1420.85mg / L, and is a hot sodium bicarbonate radon spring rich in both free carbon dioxide and radon.	Enhance immunity, activate cells, improve health and reduce weight.
Heyuan	AAAA	6000	60-70	It is rich in 58 mineral	Help to

Bavaria Manor				elements, such as metasilicic acid, lithium, strontium, zinc, manganese, fluorine and so on. The fluorine content of metasilicic acid is up to 110.53 mg/L, and the content of fluorine is 5.31 mg/L.	reduce the incidence of cardiovascular diseases
Heyuan Zijin Royal Linmen Hot Spring Resort	AAAA	8000-10000	86	Water quality is sodium bicarbonate type, salinity is 435-513 / L, belongs to light hot spring, metasilicic acid concentration 120-129mg / L, fluorine content 13.33-14.7 mg / L, it is medically available silicon water, fluorine water, slightly sulfur smell.	It has the auxiliary medical function on obesity, skin diseases

2.Comprehensive exploitation of hot spring resources in Heyuan

In the age of leisure and vacation, the hot spring tourism of Heyuan is no longer limited to the single carrier of hot spring resources, but is gradually formed to be supported by hot spring bathing culture,natural ecological environment, historical and humanistic customs, leisure and entertainment services,so Heyuan hot spring tourism aims to let tourists to experience hot springs, feel culture, have rest and preserve health.It can be said that with the transformation and upgrading of tourism, the deepening of tourism in the whole region, the transformation of closed tourism from circular to open "tourism", the hot spring tourist destination in Heyuan also presents a new comprehensive development pattern. The "hot spring+" mode brings tourists an unprecedented experience of touring, including "hot spring +sightseeing and entertainment", "hot spring+ humanistic theme", "hot spring + vacation complex", etc.

2.1Hot spring+ sightseeing and entertainment

The comprehensive development mode of "hot spring+ sightseeing entertainment" integrates the hot spring resources, ecological environment and recreational facilities which provides diversified services for tourists. For example,Relong Hot Spring Resort recommend hot spring in winter , drifting in summer, relying on the original ecological conditions of the hot water river.It used high-tech synchronous control system to present "water dream show" of light, electricity, shadow, sound.Tourists who love fashion sports and adventure exploration can feel the 5D experience of seeing, listening, smelling, tasting and touching in the night drift experience. The Crystal Spa Resort focuses on creating the "World Bath Culture" theme hot springs, and spends money to build the first Dinosaur theme Aquatic Paradise in South China, combining with the Green Manor of drunken Butterfly Valley to bring the spa culture ,dinosaur culture ,ecological culture and other integration together.

2.2 Hot spring+ humanistic theme

The comprehensive development mode of " hot spring+ humanistic theme" focuses on the overall design of the scenic spot around the specific humanistic theme, in order to create a unique visual experience and set up special characteristic service. For example, the Royal Linmen Hot Spring Resort is characterized by Bali's traditional architectural culture, making full use of various kinds of folk works of art such as Bali handmade art carving to embellish the resort.Bali Hot Spring SPA set up there.Indonesian technicians bring comfortable experience of "Bali Health Valley" to tourists. The theme of Yeyuan Hot Spring Resort is to create ecological hot springs with Hakka characteristics.Tourists can enjoy hot springs while experiencing Hakka tradition ,such as contents of besieged dragon house, Hakka mother wine, appreciating Ding, folk songs, etc.

2.3 Hot spring + vacation complex

The development mode of "hot spring+ vacation complex" is the product of continuous development of leisure economy, experience economy and sharing economy. This mode combines sightseeing and entertainment, vacation and leisure, recreation and sports, business as a hot spring industry cluster. The Bavarian manor's "hot spring +three holidays" mode is a typical example of this mode. The scenic area is vacation leisure synthesis which forms the "Internet+ Hot springs+ Happy living+ Flower sea Farm+ physical Education + Healthy triple nourishment". It has the characteristics of cultural experience, recreation and health preservation, fashion consumption and so on, which contains extremely high commercial value.

Table 3. Summary of comprehensive development of Heyuan hot spring tourist destinations.

Name of hot spring tourist destination	Bright spot of comprehensive development	Comprehensive development project
Heyuan Zijin Royal Linmen Hot Spring Resort	Hot Spring + Bali Island culture	Hot spring SPA, property hotel, hot spring villa, etc.
Heyuan Peace Relong Hot Spring Resort	Hot spring + 5D water dream show	Convalescent hot springs, hot water rafting, hot spring villas, hotels, real estate, etc.
Heyuan Ye Yuan Hot Spring Resort	Hot spring+ Hakka leisure agriculture	Ecological hot springs, leisure farms, real estate, etc.
Heyuan Ketianxia crystal hot spring international tourist resort	Hot spring+ dinosaur park	Theme hot springs, water parks, property rights hotels, dinosaur cultural industry park, drunk butterfly valley green manor, wedding cultural industry, etc.
Heyuan Bavaria Manor	Hot spring+ Triple care vacation	National Medical Hot Springs, Vacation Hotels, Medical Centers, Endowment recuperation, Zen Home, Tourism Real Estate, Farm of flower sea, Theater Performance, etc.

3. Comprehensive Development and Evaluation of Heyuan Hot Spring Resources

3.1 Common characteristics of comprehensive development of Heyuan hot spring tourism

No matter it is the Royal Linmen Hot Spring+Balinese culture, Yeyuan Hot Spring+ Hakka leisure agriculture, or Relong Hot Spring+5D water show, the World Crystal Hot Spring+ dinosaur park, the Bavarian Hot Spring+ Triple vacation", these "hot springs", which have a unique appeal, have promoted the integration and development of Heyuan's hot spring resources with other tourist resources. To sum up, the comprehensive development of Heyuan hot spring tourism has the following common features.

3.1.1 Hot spring tourism development is closely linked to tourism real estate

The combination of hot spring tourism development and tourism real estate industry, such as "hot spring+ property right hotel" and "hot spring house", is the most typical. For the comprehensive development of hot spring tourism, hot spring is the bright spot and selling point of compound leisure project, and tourism real estate is the important support and development of its profit structure. The behavior of tourists investing and buying homes in hot spring scenic spots is not only the material demand for financial management investment and asset appreciation, but also a promising prospect for the comprehensive development mode of "hot springs", as well as recognition of a healthy lifestyle, the ecological culture of hot springs, leisure and vacation products.

3.1.2 Close combination of Hot Spring Resource Development and Deep cultivation of scenic spot culture

The spa culture features of each developing place are bright. Through the theme of scenic spot, park planning, enterprise VI and so on, the unique context with vitality is displayed appropriately. The combination of hot spring bathing culture and exotic customs, media science and technology, Hakka culture, dinosaur culture, leisure and entertainment, ecological environment protection, and triple vacation converge into attractive cultural advantages.

3.1.3 Combination of Hot Spring Bath diversification and Recreation mode Innovation

Fish therapy spa, hot spring SPA, cave hot spring, health hot spring, sports hot spring, national medical hot spring, and diversified hot spring bubble bath way promote innovation with other recreational ways. In addition to hot spring drifting, water park, beauty therapy, cultural performing arts, there are also "exquisite, miniaturized, private" hot spring clubhouse, hot spring villa to realize the complementary management of the weak and peak season.

3.2 Bottlenecks of comprehensive development of Heyuan hot spring tourism

Based on the characteristics of humanized experience, Heyuan hot spring tourist destination is planted with the integration and development concept of "hot spring+", which enables tourists to spend tourism in a relaxed and pleasant soft environment. However, in the process of sustainable development, there are still bottlenecks and drawbacks in the development of Heyuan hot spring tourist destination.

3.2.1 The transportation of some hot spring tourist spots is inconvenient

Although Heyuan has some advantages of location, the hot spring tourism development places are generally remote, the accessibility is not good. In addition to the Bavarian Manor and Hakkirworld Crystal Springs, which are located in Gaopu Gang, Yuancheng District, other hot spring scenic spots are located in Zijin, Heping and other counties which are far from the transportation hub of the county town and are located at about 100KM away from the urban area. And most scenic areas do not have highways or national highways.

3.2.2 Shortage of land use index in hot spring project

The land use area of the comprehensive hot spring development project is large, with a small area of more than 100 mu and a large area of several square kilometers. Some scenic spots divide the comprehensive projects into multi-stage progressive development and construction or lack of foresight in the early planning of the scenic spots, which often leads to problems such as difficulties in land requisition in the later stage of construction.

3.2.3 Single mode of hot spring resource development and recovery

First, the hot spring water derivative product development is limited. Most of the hot spring water resources in Heyuan directly form bubble bath experience products, such as putting traditional Chinese medicine bags in the hot spring pool to form medicinal hot springs with different efficacy. The spa derivative products that can be purchased and taken away by tourists are very scarce. The unique products produced by a few scenic spots can only be self sufficient. For example, Zijin Royal Linmen hot spring SPA has deployed spa spray suitable for carrying, but has not carried out comprehensive research and development, batch production, brand promotion. Although the effect is remarkable, few people know it.

Secondly, the hot spring water recycling is insufficient. The sustainable development of hot spring resources includes problems of rational exploitation and resource protection, so the treatment of hot spring water is very critical, especially the lowering (rising) of temperature, disinfection and using of bubble bath water, as well as the treatment and effective utilization and recharge of waste water. This is important means for hot spring sustainable development and avoiding the exhaustion of spring water

[3]. Most of Heyuan scenic spots discharged spring water directly into the river, and the effective utilization rate is low.

4.Countermeasures for comprehensive exploitation of Heyuan hot spring resources

4.1 Improving traffic accessibility

We must take advantage of the rural revitalization policy to help improve the rural road construction in the remote hot spring tourism development area in Heyuan county, the scenic area needs to improve the traffic guidance and set up marking system at the important intersection, so as to facilitate the smooth arrival of tourists. For example, He Huiguan Expressway, is the major project of Guangdong Provincial Communications and Transport Department to give full play to the characteristics of traffic and poverty alleviation. The starting point of the nine and connecting lines of the He Huiguan Expressway is located at the Yulinmen Hot Spring Resort in Reshui Town, Zijin County, and opened to traffic at the end of 2020. The convenience for tourists to enter the Yulinmen hot spring will be greatly enhanced, which will speed up the pace of getting rid of poverty and running into well-off in Jiuhe Town, Zijin County, and promote the tourism development of Zijin County. It can be said that with the continuous development of highway, high-speed rail and other projects, the gradual improvement of Heyuan traffic development circle will directly help the city integrate into Guangdong-Hong Kong-Macau Greater Bay Area.

4.2 Enhancing the complexity of land use planning

First of all, The hot spring scenic spot strengthens the compound utilization of the developed land. For example, the Yeyuan Scenic area is characterized by "hot spring + Hakka leisure agriculture", which can be comprehensively developed in combination with the production of cash crops and agricultural breeding. We plant rare plants, medicinal materials, tea trees, fruit trees on green land, and raise fish, ducks in water areas. Secondly, scenic spots adjust the form of residential buildings. Some hot spring scenic spots where land use is relatively tight, can adopt new types of accommodation such as car camps, wooden house villas, container bases, tent camping, in order to give full play to their compact layout and land saving. Thirdly, hot spring scenic spot must fully excavate the tourism function of unused land, and strengthen the conversion of non-tourist land (such as industrial, agricultural, military and other special land) to tourism land, in order to realize the multiple stereoscopic utilization of tourism land resources [4]. In short, to build a "hot spring+" complex, we must establish the guidance of "comprehensive land development", aim at optimal returns on land development, and combine the hot spring as a feature of high added value tourism resources to clarify the relationship between the various functional formats [5], and finally achieve a breakthrough in project development value.

4.3 Realizing the diversity of exploitation and recovery of hot spring water resources

First of all, hot spring scenic spot must dig deeply into the medicinal value of water resources in Heyuan, by learning from the research and development experience of the French hot spring medicine and makeup brand, and further develop the hot spring water products with medical value, such as drinking water, medicine, skin care products, etc. We can pay attention to hot spring derivatives R & D production, marketing promotion, brand building in a professional, systematic, orderly way. With the rising of brand reputation of spa derivative products, local hot spring scenic spot brand loyalty will be consolidated. In addition, combining the characteristics of hot spring water in its own scenic spot, new ways of spa recuperation should be innovated, for example, Bavarian Manor plans the hot spring layout of Chinese Medicine according to the five elements theory of "Golden, Wood, Water, Fire and Soil", so the spot sets up special Chinese medicine convalescent service project. After professional TCM diagnosis and treatment, tourists judge their physique characteristics, and then enter the Chinese medicine hot spring pool suitable for their physique to immerse in order to improve the therapeutic effect of hot spring soaking.

Secondly, by the innovation and development of technology, the exploitation of hot spring resources is developed from extensive to intensive, and the cascade utilization of hot spring geothermal resources is carried out. Heyuan hot spring geothermal can be developed into two direction: clean energy and hot spring health care. Among them, hot springs as a clean energy can be widely used in agricultural production, science and technology expo. For example, irrigation of farmland with suitable temperature and rich trace elements can make crops early mature and increase yield, reduce pests and diseases, which is beneficial to the production of green pollution-free vegetables. Using geothermal water to raise fish can accelerate the fattening of fish at 28 °C, in order to improve the fish production. Heyuan is located in the mountainous area of eastern Guangdong Province, it is still humid and cold in winter. Using hot greenhouse can help raise seedlings, vegetables and flowers, after the use of tailing water can achieve recharge. According to the direction of hot spring health care, Heyuan scenic area has focused on promoting all kinds of hot spring baths, hot spring swimming, hot spring drifting, hot spring paradise, etc. The hot spring water after reclaimed water treatment can be changed into water-use for environment, and the hot spring water after entertainment can be filtered, disinfected and reused in order to effectively improve the utilization rate of hot spring water resources and avoid the waste of geothermal resources.

5. Conclusion

The sustainable and healthy development of hot spring resources depends not only on the renewal of energy science and technology, but also on the forward-looking comprehensive development model. The "hot spring+" industry integration and development mode is an important breakthrough in the transformation and upgrading of Heyuan tourism. Under the background of constructing "modern Heyuan and ecological Heyuan", Heyuan should fully rely on high-quality hot spring resources, cross border integration of cultural tourism and other multi-industrial resources, a comprehensive hot spring leisure industrial cluster area is formed on the basis of the existing comprehensive development of hot springs, in order to create a unique brand of Heyuan hot spring tourism, promote the quality and efficiency of Heyuan tourism and optimize the transformation.

Acknowledgments

The author would like to thank support of 2017 Guangdong education department scientific research platform and project - youth innovation talent category (project no. : 2017GWQNCX061), Philosophy and Social Sciences in Heyuan, "13th Five-Year" planning project (No. : HYSK17P06), Heyuan Polytechnic research project (No. : 2017_sk03).

References

- [1] Jiang Lei, *Distribution and characteristics of Geothermal Resources in Heyuan City* (The resources of the western region, 2018)
- [2] Qiu Jianhua, *Characteristics and causes of geothermal resources in Heyuan region* (Guangdong Building Materials, 2006)
- [3] Liu Yuefeng, *Feasibility study on the Construction Project of L Hot Spring Resort* (Guangdong University of Technology, 2012)
- [4] Yang Rongjin, Zhou Shenli, Tang Daofu, *Study on the characteristics and Development of Tourism Land-A case study of Guang'an City* (Land and Resources Science and Technology Management, 2007)
- [5] Wang Hailong, *Commercial Plan of Cui Feng Mountain Ecological Leisure and sightseeing Park* (Lanzhou University, 2011)