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Research on the Development of Tea Culture Tourism Products under the Background of Cultural and Tourism Integration

-- A Case Study of Taiping Houkui

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Abstract

China is the origin country of tea.Over the years, the tea industry in China has developed vigorously and becomes increasingly prosperous.Under the background of cultural and tourism integration, cultural creativit y is increasingly valued in the process of tourism product development.In the development process of Chinese tea products, the industrial chain is short and the added value is low.This paper will focus on the development of tea industry. Taking Taiping Houkui tea industry as an example, through data analysis, it will find out the reasons that hinder the sustainable development of Taiping Houkui tea industry, so as to develop and design tea tourism products, and discuss the basic path of sustainable development of tea tourism industry.

Keywords

Fusion of Culture and Tourism; Tea Culture; Grey Prediction.

1. The Introduction

Theoretically speaking, cultural tourism is not a completely new concept.It has been around for a long time, but it has only gained popularity in recent years.Tea culture tourism, as a combination of traditional culture and emerging products, is more conducive to exploring the sustainable development of the tea industry.Tea culture tourism is a series of tourism activities with tea and tea culture as the theme.With the rise and prosperity of cultural tourism and leisure tourism, the market value of tea culture tourism is getting higher and higher, and cultural tourism has gradually become an important content affecting People's Daily life.

The rapid development of tea culture in China also makes tea culture tourism become a new tourist resource and a new economic growth point in the development of tourism industry.The development of tea culture tourism can make the tea culture contained in it give out its unique charm, so as to promote the development of tourism.The study of tea culture tourism resources is conducive to the planning of tea culture tourism and the promotion of national tea culture.The development of tea culture tourism resources is conducive to promoting the common development of regional tea industry and tourism economy.

2. The Development Status of Tea Industry in Anhui Province

2.1. Anhui is Rich in Tea Industry Resources

2.1.1. Anhui is Rich in Tea Resources

Anhui has a long history of famous tea and good tea. Among the top ten famous teas in China, tea from Anhui accounts for 30%, namely Huangshan Maofeng, Lu 'an melon slices and Qimen black tea. Tea is a traditional cash crop in Anhui Province, which plays an important role in provincial agricultural production, local economy and agricultural export of foreign exchange. The industrialization system with coordinated development of production, processing, trade,

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comprehensive utilization, tea culture construction and socialized services has been basically formed. In 2021, the total export volume of tea in Anhui province was 2.87 million US dollars, up 2.6% year on year, accounting for 13% of the total national export volume, ranking the third among all provinces! Exports were 67,700 tons, accounting for 18 percent of China's total exports, ranking second among all provinces. The rich tea resources in Anhui province provide a strong material guarantee for the research and development of Anhui tea culture and tourism products.

2.1.2. Anhui has Many Varieties of Tea

Anhui has a better geographical location, so its climate is more suitable for tea cultivation. Anhui belongs to the warm temperate zone and the subtropical transition zone. It is located in the middle and lower reaches of the Yangtze River, with a warm and humid climate, four distinct seasons, many and uniform rain, and fertile land and rich vegetation. There are more clouds and fog in the mountainous area, with large temperature difference between day and night, which is quite suitable for the growth of tea trees. Such advantaged ecological conditions make Anhui more famous tea. There are many kinds of tea leaves in Anhui, among which the top ten famous teas are the most famous, namely, Huangshan Maofeng, Lu 'an Melon Pieces, Taiping HouKui, Qimen Black Tea, Tunxi Green Tea, Huoshan Yellow Bud, Yuexi Cuilan Orchid, Jing County Tejian, Yongxi Huoqing, Tongcheng Xiaohua. Among them, Lu' an Melon Tablets, Qimen Red Tea and Huangshan Maofeng are located among the top ten famous teas in China.

2.1.3. Tea Producing Area Environment is Suitable

Anhui province has two high-quality tea producing areas, namely the Dabie Mountains area and the southern Anhui Mountain area. Tea producing areas have high ecological quality. Dabie Mountains are surrounded by mountains, mist and mild climate, There are many mountains and forests in southern Anhui, warm and humid, deep soil layer and abundant rainfall. Moreover, there are many scenic spots in the mountainous area with beautiful ecological environment, which lays a solid foundation for the development of tea culture tourism products.

2.1.4. Tea Culture is Rich and Colorful

Anhui tea culture has a long history and rich connotation.Anhui people drink tea continuously throughout the year, not only "morning tea", "afternoon tea", "night tea", but also rich room tea, literary tea, Buddhist tea, Taoist tea and farmhouse tea. Anhui style is unique and diverse forms, rich connotation of tea customs, tea ceremony, tea ceremony and tea ceremony are deeply integrated into the life and production of Anhui people.

2.2. Anhui Tea Culture and Tourism Products are Rich

Tea culture tourism is a series of tourism activities with the theme of tea and tea culture. With the rise and prosperity of cultural tourism and leisure tourism, the market value of tea culture tourism is getting higher and higher, and cultural tourism has gradually become an important content affecting People's Daily life. The local government of Anhui province has teamed up with local enterprises to launch a series of tea culture tourism activities. During the holidays, tourists can enjoy the tea art performances, taste and eat tea to feel the fresh and elegant tea culture. The Taiping Houkui Tea Culture Tourism Festival, Jiuhuashan Buddha Tea Culture Festival and other tea culture tourism festivals are also held. In the process of tea harvesting, visitors will be personally involved, and feel the fun of picking and making tea. These tea-related activities can not only attract tourists, but also increase tea sales, contributing to the local development.

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3. The Investigation and Analysis of the Development Status of Taiping Houkui Tea Industry

Taiping Houkui tea, produced in Huangshan City, Anhui Province, is one of the top ten famous teas in China. The unique growing environment in XinMing township, where it is produced, has created the unique fragrance quality of Taiping Houkui. Among them, the monkey Kuijian tea produced by Houkeng village with high mountain advantage should be the best. Taiping Monkey Kui has now made great achievements thanks to its excellent quality and unique taste. In order to develop and expand the Taiping Houkui tea industry, it is necessary to break the traditional marketing concept, adapt to the changes of The Times, and find an innovative road suitable for the development of the Taiping Houkui tea industry. The inheritors of Taiping Houkui intangible cultural heritage adhere to the traditional techniques of their ancestors and the core skills of "picking up" of fresh leaves, charcoal fire pot finishing, and bamboo drying cage, which ensures the core quality of Houkui and lays a foundation for the rapid development of Taiping Houkui tea industry.

3.1. The Output Value of Tea Increased

Huangshan District is the only origin of Taiping Houkui. Taiping Houkui is one of the top ten famous teas in China. It is protected by four aspects: national geographical indication, national certification trademark, national intangible cultural heritage and geographical indication of agricultural products. The tea garden in the region is 75,000 mu, with a total tea output of 14,84.8 tons, an output value of 581.16 million yuan, and an average price of 379 yuan / kg. Among them, Taiping Houkui has produced 1,017 tons, and the output value is 404.962 million yuan, and the average price is 398 yuan / kg. In 2021, the average per-mu benefit of the tea garden is 7,099 yuan, and the per capita net income of tea farmers from tea is 8,873.5 yuan, ranking among the top in the province. Taiping Houkui tea industry has become a leading industry, characteristic industry and rich industry of rural revitalization; its brand value reaches 4 billion yuan, and won the highest gold award in the "World Green Tea Competition" in Japan in 2021; Huangshan District won the title of "2021 Top 100 Tea Industry Counties" and "2021 Tea Tourism Integration Characteristic County".

3.2. Tea Brand Development

In recent decades, Taiping Houkui brand construction is solid and strong. Optimize varieties at the source, vigorously develop standardized tea garden, and implement the tea seed breeding project. Processing to ensure quality, abide by the traditional technology, to ensure that the quality characteristics do not change. To ensure safety, adopt the "government subsidies + tea enterprises financing + tea farmers sponsorship" method, to promote the unified prevention and control work, to ensure that consumers can drink safe tea. In 2004, 2008, 2010 and 2013, it won the title of "Tea King" for the fourth time in China (Wuhu) and Anhui International Tea Fairs. In 2013, the brand value of "Taiping Houkui" was estimated to be 1.286 billion yuan. The brand operation force ranked the third, and the brand strength multiplier and brand development force ranked the top ten. In 2012, it was awarded the title of "the most influential regional public Brand of Agricultural Products in China". In 2013, it applied for the registration of international trademarks in 31 countries, including the United States, Britain and France, and Taiwan, Hong Kong and Macao of China.

3.3. The Income of Tea Farmers Increased

The Taiping Houkui tea industry continues to develop, and the economic benefits brought by the Taiping Houkui tea are also constantly improving, and the tea farmers have also ushered in a considerable income. The per capita income of tea farmers has increased from 8,800 yuan in 2020 to 8,873 yuan in 2021, ranking among the top among provinces and cities. The per capita

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income of the villagers in Houkeng Village of Taiping Houkui is as high as 280,000 yuan, becoming a typical example of tea prosperity in China. Every tea season, Houkeng Village villagers group will have a large number of customers coming to buy tea, and the income brought by tea has become the main source of income for tea farmers in Huangshan District.

4. Variable Selection and Model Design

4.1. Question Raising

The integration of culture and tourism has played a certain impact on the economic development of China's tea industry, especially in the most prosperous area of tea industry - huangshan region's economic development has brought certain influence, with the traveling population and the improvement of people's material life level of the economic impact of the tea industry is divided into two kinds, one kind is directly affect one kind is indirect effects.The direct economic impact involves the tea product retail industry, tourism and other industries, and many aspects are difficult to carry out quantitative evaluation. This paper makes a quantitative evaluation and analysis of the tea product retail industry and tourism industry in Huangshan region in terms of the development of tea industry.

Table 1. Tourist Receptions in Huangshan City (ten thousand)

year	Januar	February	March	April	May	June	July	August	September	October	Noveber	December
2017	319.4	774.4	1106.5	1597	2086.5	2679.1	3273	4015.5	4486.2	5261	5556.9	577.2
2018	260.5	788.3	1207.8	1775	2328.9	3004.2	3669.5	4507.1	5037.3	5914.8	6240.8	6486.
2019	297.5	905	1384.8	2027	266.8	3434.3	4189.2	5156.4	5763.5	6774.2	7130	7402.
2020	251.7	261.7	457	899.4	1232.2	1502.6	1874.2	2533.7	3011.3	3889.5	4237.4	4368.
2021	151.3	560	970.1	1644.	2070.4	2865.26	3476.9	3867.4	4370.6	5470.6	5961.5	6317.

Table 2. Total Tourism Revenue of Huangshan City, 2017-2021 (100 million Yuan)

year	Januar	February	March	April	May	June	July	August	September	October	Noveber	December
2017	29.7	77.8	120.7	159.2	197.4	240.5	293.4	357	398.2	465.4	486	506.1
2018	25.2	81.4	133.3	177.8	222.6	272	331.8	404.1	450.6	527.2	550.2	572.8
2019	29	93.9	153.6	204.4	256.4	313.4	382.5	466.1	519.3	607.8	633.7	659.5
2020	20.9	21	47	78.6	102.5	132.5	169.1	225	265.1	335.6	359.2	370.2
2021	11.7	50	100.19	166.15	198.6	274.12	345.6	374.2	415.1	496	520.6	538.1

Table 3. Tourism Population division of Huangshan City from 2017 to 2021

index	identity			career						
	Total	town	Not town	Civil servant	staff	Individual household	soldier	peasant	retiree	student
Total	62627	44342.80	18284.20	2186.70	27340.5	13081.80	268.80	2472.50	2689.30	7128.20
Over 55	5650.90	3929.50	1721.30	118.60	1371.2	918.30	33.90	459.70	2279.30	
45-54	10444.40	7280.70	3163.70	321.90	4873.8	2613.60	54.20	661.90	410	
35-44	17558	12550.90	5007	774.80	9634.6	4284.20	67.80	568.10		
25-34	***	***	***	***	***	***	***	***		***
Below 25	***	***	***	***	***	***	***	***		***

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How much does cultural and tourism integration contribute to the development of tea industry in Huangshan City? We collected data on the number of tourists received in Huangshan City from 2005 to 2017, the total income of tourism industry, the division of tourist population, and the production and sale of tea industry.

Table 4. Output of tea industry in Huangshan City from 2017 to 2021

index	2005	2010	2015	2016	2017
Tea production	59619	83276	112915	112141	115143
Green tea	43891	76984	104755	104423	106578

Table 5. Amount of China's tea export trade, 2017-2021

date	export（million dollars）		growth rate	
2017	1610		8.4	
2018	1777.9		10.4	
2019	2019.6		13.6	
2020	2038		0.9	
2021	2299.2		12.8	

Based on these historical data, a prediction and evaluation model was established to evaluate the impact of the integration of culture and tourism on tea industry products and tourism industries in Huangshan City.

4.2. Analysis and Hypothesis of the Model

According to the obtained historical statistics, it can be seen that under normal circumstances, the average value of the whole year better reflects the change law of the relevant indicators, which can be divided into two parts.

(1) The GM (1,1) model is established by using the grey theory to predict the average value of 2025 from the average value of 2005-2017.

(2) By calculating the relationship between each monthly index and the annual gross value through historical data, the index value of each month in 2025 can be predicted under normal conditions. The impact of cultural and tourism integration on the development of tea industry can be estimated by comparing the actual values.

The following two hypotheses are given:

(1) Assume that the statistical data of Huangshan City are reliable and accurate.

(2) It is assumed that the change of data during and after the epidemic of cultural and tourism integration development is only related to the influence of cultural and tourism integration development, and the influence of other random factors is not considered.

4.3. Building a Grey Prediction Model GM (1,1)

Based on the known data, the number of tourists received in Huangshan City from 2017 to 2021, the population survey, the output of tea industry in Huangshan City and the cumulative turnover of tea products are recorded as the matrix to calculate the annual average value of each year, denoted as $A=(a_{ij})_{5\times 12}$

Where a is the development gray level and b is the endogenous control gray level

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$$X^{(0)} = (x^{(0)}(1), x^{(0)}(2), ..., x^{(0)}(5)) \tag{1}$$

$$x^{(1)}(k) - x^{(1)}(k-1) = x^{(0)}(k) \tag{2}$$

$$x^{(0)}(k) + az^{(1)}(k) = b(k = 2,3,...,5) \tag{3}$$

$$Y = B(a,b)^T \tag{4}$$

$$Y = (x^{(0)}(2), x^{(0)}(3), ..., x^{(0)}(5)) \tag{5}$$

$$B = [1^{-z^{(1)}(2)} 1^{-z^{(1)}(3)} ...^{...^{-z^{(1)}(6)}} 1]^T \tag{6}$$

$$(\hat{a}, \hat{b})^T = (B^T B)^{-1} B^T Y \tag{7}$$

$$\hat{X}^{(1)}(t+1) = [x^{(0)}(1) - \frac{b}{a}]e^{-at} + \frac{b}{a} \tag{8}$$

$$\hat{X}^{(0)}(k+1) = \hat{X}^{(1)}(k+1) - \hat{X}^{(1)}(k) = [x^{(0)}(1) - \frac{b}{a}]e^{-at}[e^{-ak} - e^{-a(k-1)}] \tag{9}$$

$$u_i = \sum_{i=12}^{12}\sum_{j=1}^{5} a_{ij} / \sum_{i=12}^{12}\sum_{j=1}^{5} a_{ij}, (i = 1,2,...,12) \tag{10}$$

$$u = (u_1, u_2, ..., u_{12}) \tag{11}$$

And required level

$$\lambda(i) = x^{(0)}(i-1) / x^{(0)}(i) \in (0.7515, 1.3307)(i = 2,3,4,...,5) \tag{12}$$

If I add up $x^{(0)}$ once, then $x^{(1)}(1) = x^{(0)}(1), x^{(0)}(i) = \sum_{k=1}^{i} x^{(0)}(k)$ $(i = 2,3,4,5)$ record $x^{(1)}(1) = (x^{(1)}(1), x^{(1)}(2), ..., x^{(1)}(5))$ Take the weighted average of $x^{(1)}$, then $z^{(1)}(k) = \alpha x^{(1)}(k) + (1-\alpha)x^{(1)}(k-1)(k = 2,3,4,...,5), \alpha$ is the determined parameter $\alpha z^{(1)} = (z^{(1)}(2), z^{(1)}(3), ..., z^{(1)}(5))$

The whitening differential equation model of $GM(1,1)$ is

$$\frac{dx^{(1)}}{dt} + ax^{(1)} = b \tag{13}$$

Where a is the development gray level, b is the endogenous control gray level

Due to the $x^{(1)}(k) - x^{(1)}(k-1) = x^{(0)}(k)$, $x^{(0)}(k)$ is the gray derivative and $z^{(1)}(k)$ is the background value, then the corresponding gray differential equation model of the equation is

$$x^{(0)}(k) + az^{(1)}(k) = b(k = 2,3,...,5) \tag{14}$$

That is, the matrix form is

$$Y = B(a,b)^T \tag{15}$$

Where, the estimated value of

$$Y = (x^{(0)}(2), x^{(0)}(3), ..., x^{(0)}(5)), B = [1^{-Z^{(1)}(2)} 1^{-Z^{(1)}(3)} ...^{...^{-Z^{(1)}(6)}} 1]^T \tag{16}$$

parameter obtained by the least square method is

$$(\hat{a}, \hat{b})^T = (B^T B)^{-1} B^T Y \tag{17}$$

So this equation has a particular solution

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$$\hat{X}^{(1)}(t+1)=[x^{(0)}(1)-\frac{b}{a}]e^{-at}+\frac{b}{a} \tag{18}$$

$$\hat{X}^{(0)}(k+1)=\hat{X}^{(1)}(k+1)-\hat{X}^{(1)}(k)=[x^{(0)}(1)-\frac{b}{a}]e^{-at}[e^{-ak}-e^{-a(k-1)}] \tag{19}$$

The average value $\overline{x}$ of 2022 can be obtained from the above formula, and the total value of 2022 is predicted to be $Z=12\overline{x}$. According to the data, the proportion u_i of the index value in the ith month of 2022 to the total annual value can be calculated.

$$u_i=\sum_{i=12}^{12}\sum_{j=1}^{5}a_{ij}\ /\ \sum_{i=12}^{12}\sum_{j=1}^{5}a_{ij}\ ,(i=1,2,...,12)\ \ u=(u_1,u_2,...,u_5) \tag{20}$$

4.4. Solution of the Model

Tourism reception in Huangshan City.

Based on the number of tourist population reception in Huangshan City from 2017 to 2021, the following data chart can be drawn, and the population change trend can be seen intuitively.

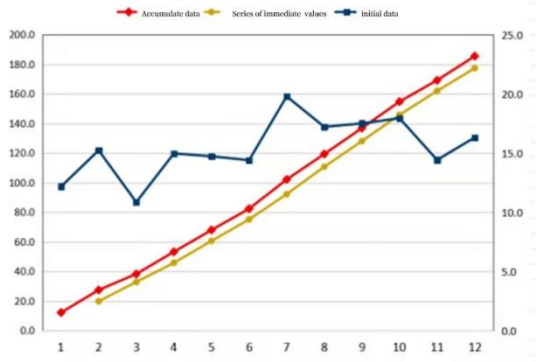

Figure 1. Trend chart of tourism population data from 2017 to 2021

According to the number of tourists in Huangshan City from 2017 to 2021, the annual average number of tourists can be obtained.

Is 2644.4 3435.1 3727.6 2043.2 3143.8, and the smoothness of the original data is shown in the figure:

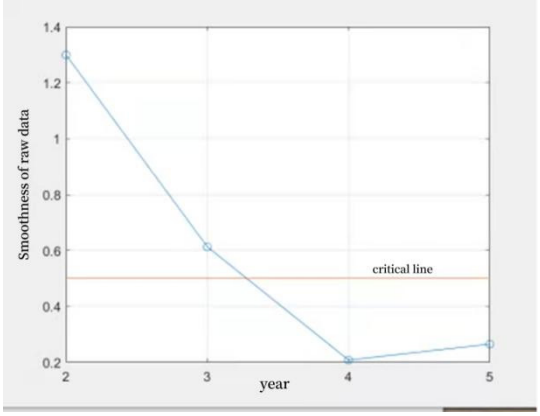

Figure 2. smoothness of the original data

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According to the above model, the three prediction results of traditional GM(1,1), new information GM(1,1) and metabolic GM(1,1) are obtained from the tourist reception number in 2017-2021, as shown in the figure below:

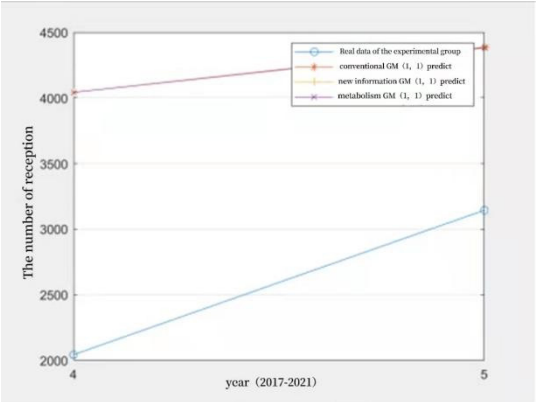

Figure 3. Prediction of each group of tourist reception

The raw data from which GM(1,1) forecasts are now made are:

[2644.4 3435.1 3727.6 2043.2 3143.8]

The development coefficient obtained by the least square method is a=-0.086891, and the ash action is b=3881.5281

The fitting results of the original data:

1:2644.4

2:3497.5969

3:3206.5154

4:2939.6587

5:2695.0107

In the future, the results of phase 2 are predicted as follows:

6:2470.723

7:2195.211

4.5. Model Checking

The evaluation result of fitting the original data is

The average relative residual was 0.18487

The average grade ratio deviation was 0.38154

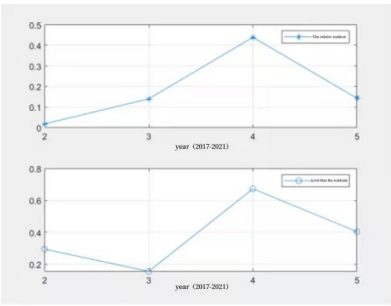

Figure 4. The relative residuals of the original data and the stage ratio deviation

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The results of residual test show that the fitting degree of the model to the original data meets the general requirements.

The results of the stepwise deviation test show that the model fits the original data well.

In the same way, the total tourism revenue, tea output and import and export trade of Huangshan city can be predicted.

The model is established to evaluate and forecast the law of economic development, which is just in line with the development of tea products under the background of cultural and tourism integration. It can properly and reasonably solve the problem of forecasting and evaluating the data law of tea industry development under the background of cultural and tourism integration, that is, the model has a wide range of application.

4.6. Results Analysis of the Model

According to the statistical report of the average annual tourist population of the city from 2017 to 2021 under the background of cultural and tourism integration, the average annual tourist population of the city from 2017 to 2021 is predicted to be 24,70.723 million and the average annual tourist population of 2023 is 21,952,211 million, which is slightly reduced compared with the average annual tourist population of 2022. And according to the statistics of the number of tourists in each year, the number of tourist population in the second half of the year shows explosive growth.The number of tourist population is predicted to decrease gradually in recent years, and the number of annual tourist population shows explosive growth in the second half of the year. These two major reasons affect the development of Taiping Houkui tea industry.The decrease of tourist population year by year affects the tourism development of tea industry tourism destinations, which directly leads to the decrease of the sales of Taiping Houkui tea.The number of tourist population showed an explosive growth in the second half of the year, which directly affected the sales of tea in the first half of the year and the situation of tea surplus.

5. The Conclusion

With the development of The Times, young people's demand for tea consumption is gradually increasing, which also promotes the rapid development of the tea industry.

For many years, the tea industry in our country has flourished and prospered. Under the background of cultural and tourism integration, tea culture tourism products have gradually gained popularity.However, in the development process of Chinese tea products, the industrial chain is short and the added value is low.Tea culture tourism is in the primary stage, and there are some problems such as small industry scale, less tourism products and low popularity.This paper takes Taiping Houkui as an example to find out the reasons that hinder the development of Taiping Houkui tea industry, that is, the number of tourist population in Taiping Houkui tourism resort is decreasing year by year, and the tourist population shows explosive growth in the second half of the year.

Based on the above two reasons, in order to better promote the development of tea culture tourism products, we put forward the following suggestions:

1. From the perspective of sustainable economic development:

In terms of infrastructure, we should strengthen the construction of infrastructure, and fully tap the characteristics of tourism resources in the development area, improve the experience of scenic spots, strengthen the publicity of scenic spots, so as to expand the tourist consumer groups.

In terms of tea output, the forecast results show that the number of tourist population is concentrated in the second half of the year, which will affect the sales of tea in the first half of the year, in order to prevent the overproduction of tea, bring losses to the enterprise. This

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requires that tea planting areas should make reasonable arrangements for tea planting and production according to the characteristics of the changing trend of the tourist population.

2. From the perspective of user experience

According to the division of tea picking period, the tea picking period is concentrated in April and May, and there are many customers aged 45-54 in that month. Tourist destinations can design scenic spots, add tea culture elements, and spread tea culture while tourists travel, such as allowing tourists to have an immersive experience, and further deepen and refine each process of tea making.

3.From the perspective of consumer groups

From June to December, the number of tourist population shows explosive growth. According to the tourist population of all ages and the nature of their jobs, intelligent tea products suitable for all kinds of people are recommended.For example, according to the characteristics of Taiping monkey Kui can replenish energy and improve work efficiency, it can be recommended to the working population. At the same time, combined with the market price of Taiping Houkui, the age class with consumption ability is 45-54 years old. According to this result, tea can be recommended to such people.

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