An assessment of recreational value of Color-leaf forest in Bipeng Valley Scenic Spot

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Abstract. This study uses the travel cost method (TCM) and the tourism market demand curve to evaluate the recreational value of the Color-leaf forest resources in Bipeng Valley Scenic Spot at the first time, which contributes to the utilization and management of the Color-leaf forest resources, and also discusses the importance and value of forestry resources. The results show that the research value of the research and development of the Color-leaf forest resources was 1567.48 million Yuan, which is 13 times the actual income of the Bipeng Valley Scenic Spot. It means scenic spot should avoid idle resources, improve its product mix and protect the Color-leaf forest resources to realize the sustainable use of forest resources of arid and semi-arid area of sichuan province.

1. Introduction
Color-leaf forest (also known as color forest) means that in the ornamental trees, the leaf color can be more stable and non-green at some stage of the growing season or growing season. Colorful leafy tree species, distributed relatively concentrated into pieces, and has a high aesthetic appreciation, the value of the forest [1-3]. At present, domestic and foreign scholars' research on Color-leaf forest resources is mostly concentrated on colorful leaf plants. Through the botany, ecology, biochemistry, genetics and aesthetics theory, the use of modern technology to color the leaf plants for coloring plants is introduced and domesticated [4-5] and the application of colorful leaf plants [6-8] and other aspects of research. Because of its visual impact and enjoyment of characteristic beauty, Color-leaf forest has become a forest tourism resource with high ornamental value and has attracted the attention of some scholars [9-10]. But in general, there are few studies involving color forest tourism, and its research on recreational value is also worthy of attention.

The recreational value of forest refers to a comprehensive benefit attached to the forest recreation resources. Its value includes: the economic benefits of forest resources and forest environment landscape generated by the forest environment [11]; the value of forest recreation is non-market. Characteristics, using traditional economic theories and methods are not measurable [12]. For the study of resource recreation value evaluation, most of the main research objects are tourism areas with natural environment and eco-tourism as the main recreation content [13], and most of the research is based on a single recreation area as the research object. Value assessment [14-16]. As the core area of...
the national-level human and biological protection circle of Miyaluo, Bipeng Valley Ecological Protection Area is also affiliated to the ecologically fragile arid and semi-arid area of Sichuan. It has a strong practical significance for the evaluation of the value of the Color-leaf forest recreation. In the choice of methods of use, this paper uses the travel expense method with more use and high maturity [17] to evaluate the value of the Color-leaf forest in Bipeng Valley.

Based on the previous studies, this study adopts the travel cost method (TCM), and takes Bipeng Valley Scenic Spot as the research object, and combines its actual situation to evaluate the recreation value of Bipeng Valley Scenic Spot. At the same time, the research results and scholars discuss the recreation value of Xiang Mountain and Guangwu Mountain, which are also the main tourist attractions of Color-leaf forest, in order to enrich the camp of value research of resources and will provide a basis for the development of the future recreation value of the red leaf color forest resources in the scenic spot.

2. Method and data

2.1. Method

TCM was first proposed by Harold Hotelling in 1942 and later applied by American scholar Clawson in 1959 to measure and estimate natural tourism resources without direct market prices [18]. In 1964, J L Knetsch modified and improved it and became widely used after the 1980s [19].

Studies have shown that using the TCM to analyze the economic cost of recreational activities in recreational destinations can provide a scientific and reasonable basis for the scenic spot consumption price management (including ticket prices, event consumption prices in the scenic spots, etc.) [20]. The basic idea of TCM: Ideally, estimating the demand curve of tourism resources is the best way to measure people's willingness to pay for recreational activities [21]. TCM research is based on the sum of the total expenses spent by tourists during the travel process (including scenic spot ticket fees, round-trip transportation costs, accommodation expenses incurred during the travel process, opportunity cost of time, etc.), through investigation, and this is a function of the relationship between the annual visits of a tourist attraction and the travel expenses and other factors, and finally calculates the consumer surplus of the recreation area, and the recreation value of the recreation area is equal to the overall tourism expenditure of the tourist destination. The sum of consumer surplus [22].

The main implementation process of the travel expense method in the application of specific examples is:

First, conduct a questionnaire survey of Bipeng Valley Scenic Spot tourists to determine the total tourism expenses (including time cost 1) of Bipeng Valley Scenic Spot tourists;

Second, establish a regression function for the travel expenses of each departure area to the tourism rate 2;

Third, calculate the consumer surplus through the tourist demand curve of each tourist source market;

Fourth, according to the overall tourism cost of tourists in Bipeng Valley Scenic Spot and the surplus of tourists, the overall value of forest recreation resources in Bipeng Valley Scenic Spot is calculated.

The total consumer surplus of the tourist in each tourism departure zone tourist market equal the area between the tourist demand curve and the tourist payment price (i.e. travel expenses) [23], which is expressed by the formula:

\[ CS = \int_{x_{min}}^{x_{max}} y(x) \, dx \]

Where: CS represents the consumer surplus;

1 Travel time value [24]: The time cost of a tourist is basically equal to one-third of the tourist's wage income.

2 Tourism rate = (number of annual tourists in a departure area / total population of the departure area) \times 1000\%.
\( p \) is the total travel cost of the tourist to and from the tourist departure area and Bipeng Valley Scenic Spot;

\( P_m \) is the total travel cost when the number of tourist trips in the tourist departure area tends to zero;

\( y(x) \) is the demand curve of the tourist departure area.

2.2. Data collection

The questionnaire survey time was July 2018 and November 2018, a total of 300 questionnaires were distributed, of which 287 were valid questionnaires, and the effective rate was 95.67%. In a total of 287 questionnaires, it can be known from statistics that Sichuan Province is the main source of export source in Bipeng Valley Scenic Spot, and Chengdu City in Sichuan Province is the most important source city in Bipeng Valley Scenic Spot. In terms of age composition, the most dominant tourist age in Bipeng Valley Scenic Spot is 21 to 50 years old. In terms of education level, most of the tourists are secondary education and higher education, accounting for 83.3% of the total. In terms of occupation, private enterprises and retirees are the most common, accounting for 44.3% of the total. In terms of economic income level, the number of tourists in the 3501~4500 yuan stage is 101, accounting for 35.19% of the total number of tourists; the number of tourists with monthly income above 4,500 yuan is 66, accounting for 22.99% of the total number of tourists. See Table 1 for details.

**Table 1. The descriptive statistics of tourists’ characteristics**

| Variable                | Item                     | Frequency | Ratio(%) |
|-------------------------|--------------------------|-----------|----------|
| Source Area             | Within the province      | 215       | 74.9     |
|                         | Outside the province     | 72        | 25.1     |
| Gender                  | Male                     | 139       | 48.4     |
|                         | Female                   | 148       | 51.6     |
| Age                     | 20 years old and below   | 13        | 4.5      |
|                         | 21-30 years old          | 108       | 37.6     |
|                         | 31-50 years old          | 100       | 34.8     |
|                         | Over 50 years old        | 66        | 23.0     |
| Educational level       | Graduate student or above| 22        | 7.7      |
|                         | Higher education         | 120       | 41.8     |
|                         | Secondary education      | 119       | 41.5     |
|                         | Primary education        | 26        | 9.0      |
| Career                  | Civil servant            | 12        | 4.5      |
|                         | Enterprises and institutions | 44    | 15.3     |
|                         | Student                  | 41        | 14.3     |
|                         | Private enterprise       | 64        | 22.3     |
|                         | Soldier                  | 3         | 1.0      |
|                         | Science, education, culture and health personnel | 28 | 9.8 |
|                         | Freelancer               | 25        | 8.7      |
|                         | Retired staff            | 63        | 22       |
|                         | Other                    | 6         | 2.1      |
| Income                  | 1500 yuan or less        | 30        | 10.5     |
|                         | 1501-2500 yuan           | 31        | 10.8     |
|                         | 2501-3500 yuan           | 59        | 20.56    |
|                         | 3501-4500 yuan           | 101       | 35.19    |
|                         | More than 4500 yuan      | 66        | 22.99    |
|                         | 1 day                    | 85        | 29.6     |
| Residence time          | 2 days                   | 140       | 48.8     |
|                         | 3 days                   | 62        | 21.6     |
|                         | 1 time                   | 226       | 78.7     |
|                         | 2 times                  | 47        | 16.4     |
|                         | 3 times                  | 6         | 2.1      |
|                         | 4 times                  | 8         | 2.8      |
3. Results

3.1. Tourist departure area division
In the study, the division of the tourist departure area is divided according to the administrative division, and the same provincial level is divided into the same departure area. According to the survey results, a total of 14 provincial-level administrative areas of tourist information were obtained.

3.2. Calculation of travel rate and travel expenses
Considering that the tourists are mostly urban residents, the total population \( P_i \) of the i-th departure area is selected to be more scientific for the total population of the departure area. Therefore, the tourism rate \( VR_i \) of the i-th departure area can be calculated by the following methods:

\[
VR_i = \frac{X_i}{287} \times \frac{T}{P}
\]

(1)

Where: \( VR_i \) represents the tourist travel rate of the i-th tourist departure zone; \( X_i \) represents the number of sampled tourists in the i-th tourist zone; \( T \) represents the total number of tourists in the surveyed area; \( P_i \) represents the i-th tourist departure zone the total population of the town.

In terms of travel expenses, it is necessary to clarify the concept of travel time value. It refers to the opportunity cost that tourists lose when they use time to travel and use the value created by the time. The travel time used for tourism activities can be used for the opportunity cost of time. Perform calculations [24]. The study calculates the working hours of tourists as 22 days of work per month, 8 hours of work per day, and travel time opportunity costs are one-third of the actual wage rate. According to the survey results, the calculation results of the travel rate and travel expenses of each departure area to Bipeng Valley Scenic Spot can be seen in Table 2 and Table 3.

| Departure area | Sample number/perso n | Sample ratio/% | Total urban population /10,000 people | Annual per capita income / yuan | Per capita travel cost / yuan | Travel rate /% | Travel time / hour | Travel time cost / yuan | Per capita total travel expense / yuan |
|----------------|------------------------|----------------|--------------------------------------|-------------------------------|-----------------------------|----------------|------------------|------------------------|-------------------------------------|
| Guangyuan      | 1                      | 0.35           | 70.9                                 | 28132                         | 2149.57                     | 0.39           | 48               | 213.12                 | 2362.69                             |
| Bazhong        | 2                      | 0.70           | 99.4                                 | 28286                         | 2127.92                     | 0.56           | 36               | 160.72                 | 2288.64                             |
| Guang'an       | 2                      | 0.70           | 107.7                                | 30616                         | 1901.38                     | 0.52           | 36               | 173.95                 | 2075.34                             |
| Leshan         | 2                      | 0.70           | 126.5                                | 31070                         | 1807.85                     | 0.44           | 48               | 235.38                 | 2043.23                             |
| Yaan           | 2                      | 0.70           | 65.9                                 | 29732                         | 1332.37                     | 0.84           | 48               | 225.24                 | 1557.62                             |
| Neijiang       | 3                      | 1.05           | 114.5                                | 30393                         | 2013.56                     | 0.73           | 48               | 230.25                 | 2243.81                             |
| Yibin          | 3                      | 1.05           | 147.1                                | 30832                         | 1776.63                     | 0.57           | 48               | 233.58                 | 2010.21                             |
| Dazhou         | 5                      | 1.74           | 212.2                                | 28383                         | 1871.19                     | 0.65           | 38.4             | 172.02                 | 2043.2                              |
| Panzhihua      | 5                      | 1.74           | 57.1                                 | 35620                         | 1388.45                     | 2.42           | 43.2             | 242.86                 | 1631.32                             |
| Mianyang       | 6                      | 2.09           | 179.2                                | 31822                         | 1999.78                     | 0.93           | 48               | 241.08                 | 2240.86                             |
| Deyang         | 7                      | 2.44           | 120.5                                | 31609                         | 1222.74                     | 1.61           | 50.4             | 251.44                 | 1474.18                             |
| Meishan        | 7                      | 2.44           | 111.3                                | 31130                         | 1494.39                     | 1.74           | 38.4             | 188.67                 | 1683.06                             |
| Ziyang         | 7                      | 2.44           | 56.3                                 | 30867                         | 1369.44                     | 3.45           | 43.2             | 210.46                 | 1579.89                             |
| Luzhou         | 8                      | 2.79           | 209.1                                | 31449                         | 1457.07                     | 1.06           | 36               | 178.69                 | 1635.76                             |
| Nanchong       | 8                      | 2.79           | 206.6                                | 28333                         | 1668.69                     | 1.07           | 48               | 214.64                 | 1883.33                             |
| Suining        | 8                      | 2.79           | 96.4                                 | 29308                         | 1428.75                     | 2.30           | 48               | 222.03                 | 1650.78                             |
| Zigong         | 8                      | 2.79           | 134.2                                | 31016                         | 1610.72                     | 1.65           | 36               | 176.23                 | 1786.94                             |
Table 3. Statistical results of surveys of tourists outside the province

| Departure area | Sample number/person | Sample ratio/% | Total urban population /10,000 people | Annual per capita income yuan | Per capita travel cost yuan | Travel rate /% | Travel time/hour | Travel time cost yuan/ yuan | Per capita total travel expense / yuan |
|----------------|----------------------|---------------|-------------------------------------|-----------------------------|--------------------------|----------------|----------------|--------------------------|-----------------------------------|
| Hebei          | 1                    | 0.35          | 4136                                | 30547.8                     | 2540.57                  | 0.07          | 48            | 231.42                   | 2771.99                           |
| Yunnan         | 1                    | 0.35          | 2241                                | 30995.9                     | 2379.94                  | 0.12          | 48            | 234.82                   | 2614.76                           |
| Zhejiang       | 1                    | 0.35          | 3847                                | 31640.3                     | 2085.60                  | 0.25          | 48            | 239.70                   | 2325.30                           |
| Anhui          | 3                    | 1.05          | 3346                                | 62406.3                     | 1704.83                  | 0.44          | 48            | 472.78                   | 2177.60                           |
| Beijing        | 3                    | 1.05          | 1878                                | 62406.3                     | 1704.83                  | 0.44          | 48            | 472.78                   | 2177.60                           |
| Guizhou        | 3                    | 1.05          | 1648                                | 29079.8                     | 1999.42                  | 0.51          | 48            | 220.30                   | 2219.72                           |
| Henan          | 3                    | 1.05          | 4795                                | 29557.9                     | 2380.76                  | 0.17          | 55.2          | 257.51                   | 2638.27                           |
| Shaanxi        | 3                    | 1.05          | 2178                                | 30810.3                     | 1772.57                  | 0.38          | 48            | 233.41                   | 2005.98                           |
| Gansu          | 4                    | 1.39          | 1218                                | 27763.4                     | 1831.07                  | 0.91          | 55.2          | 241.88                   | 2072.95                           |
| Shandong       | 4                    | 1.39          | 6062                                | 36789.4                     | 2046.75                  | 0.18          | 52.8          | 306.58                   | 2353.33                           |
| Hunan          | 6                    | 2.09          | 3747                                | 33947.9                     | 1748.12                  | 0.44          | 60            | 321.48                   | 2069.60                           |
| Guangdong      | 11                   | 3.83          | 7802                                | 40975.1                     | 1779.54                  | 0.39          | 60            | 388.02                   | 2167.57                           |
| Chongqing      | 29                   | 10.10         | 1971                                | 32193.2                     | 1481.02                  | 4.07          | 52.8          | 268.28                   | 1749.30                           |
| Total          | 72                   | 25.1          | 44869                               | 467968                      | 25714.4                  | 8.02          | 684           | 3901.6                   | 29615.6                           |

Note: The total urban population and annual per capita income of foreign tourists are from the China Statistical Yearbook (2018).

3.3. Building regression model of Travel Costs and Tourism Rate

Using TCM to calculate the value of forest recreation resources in Bipeng Valley Scenic Spot, we must first establish a tourism travel cost-tourism regression model. The travel expenses use the total travel expenses of the tourists, that is, the travel expenses of the tourists and the time cost of the tourists. Using Eviews8.0 and Excel2013 software to analyze the tourism rate and the income level of tourists, travel time and overall tourism consumption, the regression function of the tourist interest rate and related factors in the province and the outside of the Bipeng Valley Scenic Spot can be seen in Table 4.

Table 4-1. Results of correlation analyses on travel rate in Sichuan province and related factors

| Regression equation | R^2 | Prob | F value |
|---------------------|-----|------|---------|
| Y=0.062922-0.0000262x_1 \* (5.202) *** (-4.093) *** | 0.512 | 0.001 | 16.755 |
| Y=0.042147-0.000666x_2 \* (2.637) ** (-1.781) * | 0.166 | 0.094 | 3.173 |
| Y=-0.075793+0.0000029x_3 \* (-3.333) ** (3.963) *** | 0.495 | 0.001 | 15.703 |
Table 4-2. Results of correlation analyses on travel rate beyond Sichuan province and related factors

| Regression equation | R²  | Prob | F value |
|---------------------|-----|------|---------|
| Y=0.006362-0.00000251x1 | 0.458 | 0.011 | 9.286 |
| (3.352) ** (-3.047) ** |
| Y=0.001132-0.0000000143x2 | 0.019 | 0.657 | 0.208 |
| (0.968) (-0.457) |
| Y=0.000258+0.00000682x3 | 0.001 | 0.917 | 0.011 |
| (0.077) (0.107) |

Note: Y is the travel rate, X1 is the total travel cost, X2 is the travel time, and X3 is the travel income. Where the parentheses indicate the t-test values corresponding to the respective variables, ***, ** and * denote significance levels at 0.001, 0.005 and 0.01%, respectively.

As can be seen from Table 4, the tourist tourism rate in the Bipeng Valley Scenic Spot is negatively correlated with the overall tourism cost (including time cost) of the tourists, that is, the higher the overall cost of tourism, the lower the tourist rate of tourism to Bipeng Valley Scenic Spot. At the same time, the tourist travel rate is also negatively correlated with the travel time of tourists, with the increase of tourists' travel time, on the one hand, the travel time cost of tourists increases, on the other hand, the cost of travel and accommodation in the travel process is also increased, resulting in an increase in overall travel expenses, which is logical. The tourism tourist rate in the province is positively correlated with the income level of tourists. The higher the income level of tourists, the stronger their ability to pay and the stronger their desire to travel. The tourism tourist rate outside the province in Bipeng Valley Scenic Spot is negatively correlated with the tourist travel time, which indicates that the longer the traveler travels to a certain place, the longer the desire to travel to the place will be relatively lower. This is in line with the psychology of tourists.

The tourism tourist rate is mainly affected by the total urban population in the tourist departure area, the economic income level of local urban residents, tourist travel time, travel expenses and other factors [20]. In a short period of time, the total population of the various departure areas and the income level of residents are not relatively stable, at the same time, the travel time of tourists can be converted into the cost of travel time, which is included in the overall cost of tourism, then this study only considers the impact of the overall cost of tourism on the number of tourists visiting Bipeng Valley Scenic Spot. Taking the tourist travel rate as the dependent variable y, the traveler's overall travel cost as the independent variable x, the regression regression method is used to obtain the regression equation of the travel rate and the overall travel cost. It can be seen from Table 4 that the tourist coefficient of the province—the overall travel cost regression equation is determined by the coefficient R²=0.512, F=16.755, by checking the F distribution threshold table, F>F0.001(1,18)=15.38, The regression model was established. Tourism rate of tourists outside the province—the coefficient of regression of the overall travel cost regression equation is R²=0.458, F=9.286. By checking the F distribution threshold table, F>F0.05(1,13)=2.145, and the regression model is established.

3.4. Consumer surplus calculation

In a short period of time, the total population of the various departure areas and the income level of residents will not change greatly. At the same time, the travel time of tourists can be converted into the cost of travel time, which is included in the total cost of tourism. For each tourist departure area, according to the above Correlation analysis shows that the tourist tourism rate in the Bipeng Valley Scenic Spot is negatively correlated with the overall tourism cost (including time cost) of the tourists. As the overall cost of tourism increases, the tourist travel rate to Bipeng Valley Scenic Spot will be relatively lower, gradually increase the travel expenses to a certain value, the travel rate of the departure area will be reduced to 0%, and the number of tourists going to the tourist area is 0. According to the regression equation established by the tourism rate and the overall cost of tourism, the correspondence between the additional travel expenses of the tourist area and the total number of
 tourists can be obtained, thereby calculating the functional formula between the total cost of tourism and the number of tourists, that is, the Tourism demand curve in the tourist area.

When the overall cost of tourist tourism in the Sichuan province (including the cost of travel time) increased to 2401.6 yuan, the number of tourists visiting the Bipeng Valley Scenic Spot in the province decreased to 0; when the total cost of tourism outside the province (including the cost of travel time) increased at 2534.6 yuan, the number of tourists from outside the province to Bipeng Valley Scenic Spot decreased to 0. The regression equation for fitting the additional cost of the tourists in the Sichuan province and the number of tourists is: \( y = 524712.004 - 777.042x \), where \( y \) is the total number of tourists in the Sichuan province, and \( x \) is the additional travel expenses of the tourists in the Sichuan province. The judgment coefficient \( R^2 = 1 \), \( F = 582584448.5 \), and the equation is established by checking the F distribution threshold table, \( F > F_{0.001}(1,35) = 13.29 \), and the equation is established.

| Additional cost / yuan | Total tourist visits / person | Additional cost / yuan | Total tourist visits / person |
|------------------------|------------------------------|------------------------|------------------------------|
| Sichuan Province       |                              | Outside of Sichuan Province |
| 0                      | 524700                       | 20                     | 509160                       |
| 20                     | 493621                       | 40                     | 246772                       |
| 40                     |                              |                         | 223244                       |
| 675                    | 0                            |                         | 230                          |

The regression equation for fitting additional expenses to tourists outside the Sichuan province and the number of tourists is: \( y = 270328.469 - 1177.627x + 0.007x^2 \), where \( y \) is the total number of tourists outside the Sichuan province, and \( x \) is the additional travel expenses for tourists outside the Sichuan province. The judgment coefficient \( R^2 = 1 \), \( F = 11427873.56 \) by checking the F distribution threshold table, \( F > F_{0.001}(1,13) = 17.81 \), and the equation is established.

For a tourist destination, when the overall cost of tourism increases gradually, the number of tourists will gradually decrease. When the travel cost increases by a small value \( \Delta P \), the shadow area of \( \Delta P \) projected onto the x-axis can be used as a When the tourist number is \( N \), the consumer surplus of the tourist area, so the overall consumer surplus of the tourist area of a certain place can also be regarded as the shadow area of the tourist destination tourist demand curve projected onto the x-axis, there by the travel demand curve of the tourist area is integrated and the consumer surplus of the tourist area can be obtained.

Provincial resident consumer surplus calculation

\[
CS_1 = \int_0^P y(x)dx
\]

Where: \( CS_1 \) represents the surplus of tourists in the province; \( P \) represents the maximum value of additional travel expenses; \( y(x) \) represents the functional relationship between the additional cost of tourists in the province and the number of tourists in the province.

The remaining tourists in the province is \( CS_1 = \int_0^{75} (524712.004 - 777.042x)dx = 177,160,700 \) yuan.

Similarly, the consumer surplus of the province’s tourists

\[
CS_2 = \int_0^P y(x)dx
\]

Where: \( CS_2 \) represents the surplus of the consumer outside the province; \( P \) represents the maximum value of the additional travel expenses; \( y(x) \) represents the functional relationship between the additional cost of the foreign tourists and the number of tourists outside the province.

Then the surplus of tourists outside the province is \( CS_2 = \int_0^{230} (270328.469 - 1177.627x + 0.007x^2)dx = 31,055,700 \) yuan.

According to the calculation results, it can be seen that the remaining \( CS = CS_1 + CS_2 = 208,216,400 \) yuan for tourists in Bipeng Valley Scenic Spot.
3.5. Calculation of total recreation value
The value of forest recreation in Bipeng Valley Scenic Spot = ∑ the total cost of tourist tourism in each departure area (including time cost) + the remaining CS of tourists in Bipeng Valley Scenic Spot.

The total value of forest recreation in Bipeng Valley Scenic Spot is 1,359,262,100 yuan plus 208,216,400 yuan equals 1,567,478,500 yuan.

4. Conclusions
The value of the recreation value of Bipeng Valley Scenic Spot calculated by the travel cost method is 1,567,478,500 yuan, and the evaluation result is much higher than the actual income of the Bipeng Valley Scenic Spot of 120 million yuan, up to 13 times. It can be seen from this that Bipeng Valley Scenic Spot still has great potential for recreation and development. In the process of development and utilization, it should pay attention to the protection of forest resources and local ecological environment in Bipeng Valley Scenic Spot, and enhance people's awareness of ecological environment protection. Enhance the understanding and responsibility of tourists and managers in scenic spots to protect Color-leaf forest resources. As one of the most important tourist attractions of Bipeng Valley, Color-leaf forest resources is extremely necessary to dig deep into its recreational value. This also has certain reference significance for the promotion of the value of the recreation of the Color-leaf forest in northwestern Sichuan and even the whole country. In combination with the evaluation of the value of Beijing Xiang Mountain and Bazhong Guangwu Mountain recreations, which are also the main tourist attractions of Color-leaf forest as the main tourist attraction [25], it is believed that the tourism value of Bipeng Valley Color-leaf forest resources and the economically developed areas (Beijing) and the colorful forest ornamental development are relatively mature, and the Guangwu Mountain (known as “the first mountain of Chinese red leaves”) has a competitive ability that cannot be ignored. Vigorously highlight the important value of its recreational value in the value of ecosystem services, and promote the sustainable development of tourism in ecologically fragile areas.

5. Discussions
As people's demand for natural tourism grows stronger, the recreational service function of forest resources has become an academic problem worthy of study [26], but related research is less involved in the contribution of resource elements. The quantitative evaluation of the contribution of resource elements provides an important theoretical basis for managers to develop the protection development model and management practices of the optimal scenic area tourism resources [27]. According to this, in the process of developing and utilizing the Color-leaf forest resources, we should pay attention to the improvement of the recreational development potential, that is, the contribution ability, and improve the emphasis on the color forest resources, protection and publicity. In addition, Aba Prefecture belongs to the arid and semi-arid region of Sichuan Province and is an ecologically fragile area. The purpose of the study is to evaluate the value of the value of the ecological environment resources, which is to explore the importance and value of the ecological environment resources, which helps to avoid the idle resources of the government. Provide reference for environmental protection and environmental charges for operating companies. Simultaneously, from the perspective of sustainable development and unified evaluation standards, the future should be further studied on how to improve the recreational value of the Color-leaf forest resources, the degraded Color-leaf forest landscape reconstruction technology and the construction of the Color-leaf forest evaluation index system.

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