Research to the Methods of Economic Loss Budget on Eco-tourism Resources

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Abstract: As an expression of recreational function on natural geographic and ecological environment, eco-tourism resource is blessed with some features such as subjectivity, dynamics and relativity. Up to the temporal and spatial feature of eco-tourism resource, the expression and composition are very close to the economic loss budget. Based on the normal methods of Economic Loss Budget of tourism, we study on the feasibility of Future Profits Methods, with a empirical study on Baotianman National Nature Reserve.

Keywords: Eco-tourism, Economic Loss Budget, Future Profits Methods

1. Introduction

The scientific and rational value of the eco-tourism resources is in favor of the cost - benefit analysis of the tourism development and investment and the protection of the eco-tourism resources development, specification, and sustainable development. At present, the main method and system are initially formed by the international resources and environmental value [1-4] accounting to the theory and evaluation methods of the utility theory basis, the scarcity of resources, welfare economics and environmental economics. The research to the relative methods of monetization has also been in-depth in the tourism value field [5-8], which classifies recreation resources (especially the natural resources) as an environmental stuff and is established through the alternative value or indirect assessment, taking a stand on environmental economics. This research pays more attention on the recreational value of forest resources, while the relative theory of the eco-tourism resource assessment and social demands are lagging behind.

Eco-tourism resources mean the kind of resources exiting on their own. The form of Eco-tourism resources and local landscape are interdependent to their environment, such as mountains, forest, rivers, beaches, grasslands and waterfalls, which are the complex of eco-tourism landscape resources and environmental resources. The eco-tourism landscape resources indispensably belong to the environmental resources. The eco-tourism resources subconsciously provide recreational function as well the environment for enjoyment. Therefore, eco-tourism resources are characterized by indivisibility and non-competitive feature. They are also characterized by the feature of public property which is hard to be exclusive. Without the market transaction price, the value of eco-tourism resources includes its recreational value (operating) and environmental value (non-operating), may not apply to the traditional methods of commercial asset evaluation, but to the economic value assessment of eco-tourism resources. With the trend of the global eco-tourism and the advocacy of green accounting system of the national economy for sustainable development in the resource- economic - environmental integration, it is necessary to conduct a

comprehensive study in the field of the monetization accounting of the eco-tourism resources and the environment.

2. Methods of Economic Loss Budget on Eco-tourism Resource

The theory and methods of the economic value monetization of tourism resources, which are derived from environmental impact assessment (EIA: environmental impact assessment) originate in the disciplines of environmental science, economics, sociology, psychology, behaviour science, etc. Moreover, they have constantly improved with the development of the public product theory, the theory of consumer surplus and personal preference of welfare economics. Resources for the Future (RFF), the London Group on Environmental Economic Centre (LEEC), the United Nations Environment Programme (UNEP), Economic Development and Cooperation Organization (OCED) also make important contributions [9-10]. Currently the popular approach is the contingent valuation method.

Eco-tourism is closely related to the eco-system and the environment. Usually eco-tourism resources are valued as environmental goods. Through the asset valuation of ecological resources and the integration into the cost - benefit system of the tourism resources development, people avoid the disorderly development, free use and waste of resources. Still, whether it is the economic loss budget to the recreational function of the ecological resources, or the accounting of the ecosystem function, based on ecological resources and the environment; assessment methods are the actual valuation method, travel cost method, contingent valuation method, the shadow price method and the opportunity cost method. In essence, it is the expression by the shadow price of eco-tourism resources, the public (including tourists) desire to pay and consumer surplus, which are the combination or variant of the above methods. Eco-tourism projects grow gradually from the operation commencement to relative maturity. Using contingent valuation and travel costs, people account for the economic value. By defining tourism market and consulting the desire to pay, they has ignored the key factor in the travelling process is the effect value of "reputation or brand" which is dynamically changeable in the aspect of attraction. The diversity and ambiguity of the desire to pay, the uncertainty to define the tourist market will cause the error of the accounting results.

3. Feasibility of the Future Income Approach

In the economic field, based on the future earnings, people usually use the income method of the asset valuation, the Gains Method of the Property Valuation and one of the asset evaluations. The requirements of the applicable conditions are: the assessment object has been continuously used for a long time and makes quite some gains in the following years; the risks borne by the owner of the assessment and the future earnings of the assessment can be measured by monetary; the assurance of the expected revenue can be measured by the cash flow or the net income. The operating economic loss budget, meeting the above conditions, may learn from the brand asset valuation, so that people would forecast the future earnings by the basic data of its net income to avoid the uncertainty of the value calculation method. The method of conventional tourism, future value implementation may reflect the trend and value of the new eco-tourism products.

Therefore, in operating eco-tourism regions, it should be feasible for people to use future income to account economic value of eco-tourism resources on its continued ability to profit. This approach can be more authentically and accurately reflect the future earnings or the currency prices of assets.

4. Economic Loss Budget on Eco-tourism in the Baotianman National Nature Reserve

4.1. The Value Composition of Baotianman Eco-tourism Resource

The economic value of eco-tourism resources in Baotianman National Nature Reserve can be mainly divided into the value of ecological benefits and recreational value. The ecological value of environmental benefits in this study will be calculated with the reference to the results of comprehensive application in "the value accounting of Chinese forest resources" 1994 (no separately itemized calculation). The core area in the Nature Reserve is 3040 hectares, with 1214 hectares of buffer, 5050 hectares of the experimental area. The average growth rate of forest is 3.03%; the forest coverage is 95.8%. The total stumpage accumulation is

772856m3 in the survey of December, 1999; there are 14 million mu of natural secondary forest in protected areas; the forest production of the nature reserve in mid-2005 volume / volume Press is calculated as follows:

$Q = M \times (1+a)^n$

Q is the forest production volume / volume. M is the forest stock volume in 1999. a is the annual average productivity of the forest. n the number up to this year. After calculation Baotianman Nature Reserve forest production in 2005 is 9.2444e +005m3. In 2005 the value of all the environmental benefits in the Baotianman Nature Reserve can estimate as the following formula:

$E1 = Q \times m \times r$

E1 is the value of environmental benefits. m is the coefficient of environmental values, generally from 6 to 20, here taking as 17. r is the forest unit price ($ / m3) which is taken the world timber price 988.6 yuan / m3 in 2001. Calculation result is:

E1=1.5536e+010 (RMB)

The eco-tourism area of the nature reserve is 3000 hectares, accounting for 32.24% of the entire protected areas. All the environmental value of ecotourism forest Ev is approximately 5.0096e +009.

4.2. The Recreational Value Model of Baotianman Eco-tourism Resources based on Brand and Reputation

During the valuation, without the consideration of the business risk, industry risk, market risk, policy risk and other factors, economic value model of Baotianman eco-tourism is:

$E = I \times G$

Where E is the total value of the eco-tourism recreation function; I is the average net income in recent years with the access to the gray system prediction and the weighted net income of the eco-tourism in recent years; G is the recreational value coefficient with the access to the affection to the reputation and brand effect of Baotianman ecological tourism"

4.3. The Affection to the Reputation and Brand Effect of Baotianman Ecological Tourism

In the process of the economic value of eco-tourism, its basic data should not be just selected in the year, but from the mature data which were selected to be accounted and then discounted.

Table 1 is the development data of Baotianman eco-tourism projects from 2001 to 2004. With the help of the gray system prediction model to predict the development data of Baotianman eco-tourism from 2005 to 2009 (and then analysis and compare with the actual data from 2005 to 2009). Combined with interest rates and price rises, the discount rate on the annual average is 5 percent. The forecast data is in Table 2. Then draw more mature annual average net income of Baotianman eco-tourism by the second weighted operator to the forecast data, which is adopted as the basis of accounting data of the economic value.

Table 1 Baotianman Eco-tourism Development Data (2001-2004)

	2001	2002	2003	2004
Number of Visitors	7881	15787	40358	104693
Tickets Income (RMB)	118215	236805	605370	1570395
Other Net Income(RMB)	275835	552545	1412530	3664255
Income for the Years(RMB)	394050	789350	2017900	5234650

Table 2 Baotianman Eco-tourism Development Forecast Data (2005-2009)

	2005	2006	2007	2008	2009
Number of Visitors	198538	369350	625542	1023030	1760638
TicketsIncome (RMB)	2978070	5817262.5	9852286.5	16112723	27730049
Other Net Income(RMB)	3970760	8125700	13761924	22506660	38734036
Income for the Years(RMB)	6948830	13942962.5	23614211	38619383	66464085

Average error: 4.121758.

The time corresponding function:

x*(k+1)=278360.4exp(0.542907*k)-173667.4

Available results of the prediction data.

Table 3 Grey System 2, 3, 4-step simulation of values, residuals, relative error

	Analog Value	Residuals	Relative Error
2	200698.5	2159.65	1.088
3	345402.6	-23947.99	-6.484
4	594438.8	-31103.57	-4.972

Select the data of 2006 to 2009, followed by Fu weights 3, 2.6, 2.4, 2, obtain the relatively mature annual average net income of Baotianman eco-tourism projects:

$$I= \sum_{i=2006}^{2009} wi * ei =32884052.18（RMB）$$

Wi is the weight; ei is the prediction of annual earnings

4.4. The Affection to the Recreational Value Coefficient of the Brand and Reputation Effect

Generally, the intensity coefficient of the brand factor is from 6 to 20; when the factor coefficient is 20, factor score is 100 points under its impact of brand strength. Referring to this result, the operation of the determination of the impact factors of the Baotianman National Nature Reserve eco-tourism project, according to the comparison, research, scoring and the mean processing of the experts and research team, then obtain the recreation coefficient score of economic value of Baotianman eco-tourism and convert a recreation coefficient of economic value of Baotianman eco-tourism, here taking 17.8 (Table 4).

Table 4 Impact Factor of Recreation Coefficient of Economic Value of Baotianman Eco-tourism

		Leadership	Market-power	Impact	Trend	Support	Protection	Total	Factor Coefficient
Score	25	15	10	25	10	10	5	100	20
Baotianman	24	14	8	23	9	9	2	89	17.8

4.5. The Establishment of Economic Value of Baotianman Ecological Tourism

According to the above results, the value based on reputation and brand of the Baotianmanmay follows this eco-tourism projects:

E=I×G=32884052.18×17.8=585336128.804＝5.85e+9(RMB)

In accordance with the current bank interest rates and the calculation standard (1.9% of one-year rate, 3.24% of 3-year interest rate, 3.6% of the 5-year, four-year interest in accordance with the 3-year time deposit and a regular interest-bearing, and then subtract 20% interest tax), discounting the converted operation, then the economic value of Baotianman recreational function of eco-tourism resources:

En=5.85e+9/（1+（3×0.0324+0.019）×0.8）=542339546.679=5.42e+9(RMB)

The economic value of Baotianman ecotourism resources = economic value of ecological benefits + travel and Leisure Function:

Ev + En =5.0096e+009 + 5.42e+9 =1.043e+10(RMB)

4.6. The Model and Results of Verification

Table 5 Comparison of the Actual Number and the Prediction of Visitors

Number of visitors	2005	2006	2007	2008	2009
Prediction number	198538	369350	625542	1023030	1760638
Actual number	201980	382030	683450	890958	1704056
error（%）	1.73	3.43	9.26	-12.91	-3.21

From 2005 to 2009, the average error between the actual number of eco-tourism and the model forecast data is 6.10 in Baotianman Nature Reserve (Table 5). The forecast error of five-year total number is 1.7%, which are in line with the requirements. The growth of visitor number is rapid in 2007, which is closely related to the social stability and good economic situation. In 2008, 2009, the negative growth is closely related to the financial crisis, natural disasters, adverse weather conditions, etc.

5. Conclusion and Recommendation

To avoid the related direct data survey and the bases on the pay desire of the potential tourist market, this method chooses similar plots, takes the similar development model of mature eco-tourism projects as the reference and does the prediction of the next few years' development data in the gray system with the data of Baotianman. The trend of change is reasonable and the results possess a certain degree of accuracy and the reality directly facing their financial benefits.

The Economic Loss Budget is a combination of resources - environment - development, especial the green accounting system which has been widely advocated. Future earnings method in consideration of the future value reflects a dynamic process that the value develops with the level of the social productive forces; however, any kind of accounting of resources and environment is only a relative result. This method is only a sample to the nature of tourism process; the economic value subjects to resources and environmental constraints.

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7. Reference

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