Evaluation of the development potential of transformation & upgrading from a scenic spot to a tourism complex: A case study of Mount Qiyun

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Abstract. This research constructs a development potential evaluation index system of transformation & upgrading from a scenic spot to a tourism complex from the following four aspects: development conditions of a tourism complex, conditions of tourism resources, conditions of tourist sources and conditions of ecological environment. The method of multi-objective linear weighted function is adopted in the construction of evaluation model of development potential of the transformation & upgrading from a scenic spot to a tourism complex and based on this evaluation model the development potential of transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex has been evaluated. The evaluation results show that Mount Qiyun holds the potential of constructing a leisure & health tourism complex, which is consistent with the local government’s developing goal.

1. Introduction
Tourism complex, as a new productive force oriented towards leisure vacation with the integration of multifunctional innovation such as sightseeing, leisure, exhibitions, food, conventions, recreation and shopping, has become a worldwide tourism trend and flow. Scenic spots are an important way to the construction of tourism complex owing to their tourism resources, favorable environments and mature market conditions, but not all scenic spots have the potentiality of developing tourism complex. Through the analysis on the domestic data of tourism complex, it can be discovered that the domestic studies on tourism complex which has become an important way of tourism development, are mainly about its connotation, formation mechanism, developmental patterns and its relation with the urban development [1-3], but the researches on the evaluation of the development potential of the transformation & upgrading from a scenic spot to a tourism complex and its development path are relatively rare. This paper aims to construct an index system of development potential evaluation based on the case study of Mount Qiyun so as to provide the theoretical reference to the transformation & upgrading and its development path.

2. The evaluation method for the development potential of the transformation & upgrading

2.1. Construction of evaluation index system
So far, no evaluation index system of the development potential of the transformation & upgrading is available. This paper, in the principles of scientific, practicality and the qualitative & quantitative
combination, on the basis of summarizing tourism complex studies, by reference to the research results of development potential of tourism resources [4] as well as the feasible evaluation system of large city theme parks in cities[5], and on the advice of relevant experts, constructs an index system of development potential evaluation of the transformation & upgrading from a scenic spot to a tourism complex in the following four aspect: conditions of tourism resources, development conditions of tourism complex, conditions of tourist sources, and conditions of ecological environment. This index system has 26 indexes among which 9 are quantitative and 17 are qualitative (See Table 1).

2.2. Determination of weights
Determining the weight of every evaluation index is critical to the evaluation of the development potential of transformation & upgrading from a scenic spot to a tourism complex since determination of weights directly affects the scientific and rationality of the evaluation results. There are a number of methods to determine index weights such as analytic hierarchy process, fuzzy evaluation method, Delphi method, and expert evaluation method [5]. This paper adopts expert consultation method: Ten experts with relevant discipline backgrounds such as tourism planning, marketing, resource environment and regional economics, judge, compare and then grade the indexes in pairs in the same layer, construct judgment matrix, input these data into computers; after consistency check is passed, the weight of every index in the comprehensive layer B, the element layer C and the index layer D is acquired in the evaluation system of development potential of the transformation & upgrading (See Table 1).

2.3. Formulation of the scoring criterion and method
In evaluating development potential of transformation & upgrading, this paper adopts five-point scoring criterion (Table 1), by which the impact factors influencing development potential are evaluated in order to determine each score of these factors. In accordance with the scoring criterion in Table 1, the quantitative indexes that can be straight measured in the evaluation system are directly scored, and the qualitative indexes with subjectivity are scored by evaluating the data from questionnaires in which tourists and the government are interviewed.

2.4. The evaluation model of development potential of transformation & upgrading
With the method of multi-objective linear weighted function, the evaluation model of development potential of transformation & upgrading is constructed to conduct the comprehensive quantitative evaluation of the development potential of a tourism complex upgraded from a scenic spot, and the evaluating result is shown as the numeric value. The evaluation model is constructed as the following formula:

\[ S = \sum_{f=1}^{e} \left[ \sum_{i=1}^{m} \left( \sum_{j=1}^{n} A_{ij} B_{ij} \right) C_{i} \right] D_{f} \]

In this formula: S is the total score; \( A_{ij} \) is the index value in the jth index layer; \( B_{ij} \) is the index weight of the jth index layer; \( C_{i} \) is the index weight in the ith element layer; \( D_{f} \) is the index weight in the fth comprehensive layer; e is the number of indexes in a comprehensive layer. The number in this model is taken as 4; m and n represent the index numbers in the element layer and index layer respectively, and in this model, m is taken as 9 while n is taken as 26.

2.5. Evaluation grades of development potential of transformation & upgrading
The computing result of evaluating development potential of transformation & upgrading from a scenic spot to a tourism complex is generally in the 0-5 score interval, so based on the interval and combined with the actual situation of a scenic spot, the development potential of transformation & upgrading can be divided into five grades (See Table 2).
Table 1. The index system of development potential evaluation of transformation & upgrading from a scenic spot to a tourism complex

| Target layer | Comprehensive layer | Element layer | Index layer | Weight | Scoring criterion |
|--------------|---------------------|---------------|-------------|--------|-------------------|
|              | Conditions of tourism resources B_1 (0.31) | Resource characteristics C_2 (0.44) | Ornamental value D_1 | 0.37 | Very high | High | Relatively high | Average | Relatively low |
|              |                      |               | Health & recreation value D_2 | 0.35 | Very high | High | Relatively high | Average | Relatively low |
|              |                      |               | Scientific and cultural value D_3 | 0.28 | Very high | High | Relatively high | Average | Relatively low |
|              | Development conditions of tourism complex B_2 | Transportation condition C_3 (0.35) | Resource abundance D_4 | 0.49 | Very large | Large | Relatively large | Average | Relatively small |
|              |                      |               | Resource combination condition D_5 | 0.28 | Very good | good | Relatively good | Relatively bad | Very bad |
|              |                      |               | Resource concentration D_6 | 0.23 | Very good | good | Relatively good | Relatively bad | Very bad |
|              | Social and economic condition C_4 (0.34) | Construct land condition D_7 (0.28) | Accessibility of scenic spot D_8 | 0.46 | Very good | good | Relatively good | Relatively bad | Very bad |
|              |                      | Social economic development level (GDP / per capita dollar) D_10 | Regional traffic condition D_8 | 0.54 | Very good | good | Relatively good | Relatively bad | Very bad |
|              |                      |                              | Regional economic development level (GDP / per capita dollar) D_10 | 0.29 | >=1500 | 1500~1500 | 800~1000 | 500~800 | <500 |
|              |                      |                              | Foundation of Tourism industry D_11 | 0.24 | Very good | good | Relatively good | Relatively bad | Very bad |
|              | Government guarantee C_5 | Industrial policy guarantee D_12 | Residents’ attitude D_12 | 0.19 | Strongly agree | agree | average | Mildly disagree | disagree |
|              |                      |                              |                          | 0.29 | Very good | good | Relatively good | Relatively bad | Very bad |
|              |                      |                              |                          | 0.38 | Very | good | Relatively bad | Relatively | Very bad |


| Conditions of tourist source B_3 (0.17) | investment guarantee D_{14} | good | good | bad |
|----------------------------------------|-----------------------------|------|------|-----|
| Infrastructure optimization guarantee D_{13} | 0.33 | Very good | Relatively good | Relatively bad | Very bad |
| Tourist volume of scenic spot/ (10000 person) D_{16} | 0.55 | >=100 | 80~100 | 60~80 | 40~60 | <=10 |
| Scope of tourist source D_{17} | 0.45 | Home & abroad | domestic | Province | local | none |
| Conditions of ecological environment B_4 (0.24) | market potential C_7 (0.44) | Annual growth potential of tourists /% D_{18} | 0.31 | >=25 | 20~25 | 15~20 | 10~15 | <=10 |
| Source scale C_6 (0.56) | Market demand orientation D_{19} | 0.36 | Very good | good | Relatively good | Relatively bad | Very bad |
| Scope of tourist source D_{17} | Market competitive potential D_{20} | 0.33 | Very strong | strong | Relatively strong | average | Very bad |
| Environmental quality C_8 (0.58) | Environmental bearing capacity C_9 (0.42) | Air quality D_{21} | 0.27 | Grade 1 | Grade 2 | Grade 3 | Grade 4 | pollution |
| Environmental quality C_8 (0.58) | Environmental bearing capacity C_9 (0.42) | Surface water quality D_{22} | 0.25 | Grade 1 | Grade 2 | Grade 3 | Grade 4 | pollution |
| Noise level /dB D_{23} | 0.22 | <=30 | 30~35 | 35~40 | 45~50 | >=55 |
| Climate comfort D_{24} | 0.26 | excellent | good | moderate | Relatively bad | Very bad |
| Waste disposal rate /100% D_{25} | 0.44 | 100 | 99~96 | 95~90 | 89~85 | <=85 |
| Environmental capacity of scenic spot D_{26} | 0.56 | Very large | Large | Relatively large | Average | Very bad |

**Table 2.** The evaluation grades of development potential of transformation & upgrading

| Comprehensive evaluation value S | 0~1 | 1~2 | 2~3 | 3~4 | 4~5 |
|----------------------------------|-----|-----|-----|-----|-----|
| Assessing criterion             | Bad development potential | Small development potential | Average development potential | Relatively big development potential | Big development potential |
3. The development potential evaluation of the transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex

3.1. General situation of Mount Qiyun
Mount Qiyun, known as one of the Four Sacred Mountains of Taoism in China, one of China’s National Geoparks as well as one of China’s National Key Scenic Spots, is located in Xiuning County in Huangshan City, Anhui Province. It lies 33 kilometers to the west of Tunxi, the central urban area of Huangshan City and is adjacent to a number of famous scenic spots such as Mount Huang, Xidi and Hongcun. Mount Qiyun covers an area of 110 square kilometers and is a low mountain scenic spot with its highest peak rising to 585 meters above sea level. As an integration of Danxia scenery, Daoism culture, cliff inscriptions and idyllic scenery, Mount Qiyun boasts its picturesque, exquisite, graceful and charming scenery.

Table 3. Index scores in the index layer of development potential evaluation of transformation & upgrading from a scenic spot to a tourism complex

| index                        | score | index                        | score | index                        | score |
|------------------------------|-------|------------------------------|-------|------------------------------|-------|
| Ornamental value             | 4.4   | Regional economic development level | 3.0   | Market demand orientation    | 4.2   |
| Health & recreation value    | 4.1   | Foundation of Tourism industry | 4.0   | Market competitive potential | 4.4   |
| Scientific and cultural value| 4.8   | Residents’ attitude          | 4.5   | Air quality                  | 5.0   |
| Resource abundance           | 4.8   | Industrial policy guarantee | 4.8   | Surface water quality        | 5.0   |
| Resource combination condition| 4.6  | Tourism investment guarantee | 4.5   | Noise level                  | 5.0   |
| Resource concentration       | 4.5   | Infrastructure optimization guarantee | 4.6  | Climate comfort              | 4.0   |
| Accessibility of scenic spot  | 4.8   | Tourist volume of scenic spot | 3.0   | Waste disposal rate          | 4.0   |
| Regional traffic condition   | 4.6   | Scope of tourist source      | 3.0   | Environmental capacity of scenic spot | 4.0 |
| Construction land condition  | 4.5   | Annual growth potential of tourists | 4.0 | |

3.2. Data sources
The original data of the 9 quantitative indexes, i.e. D10, D16, D18, D21, D22, D23, D24, D25 and D26, come from statistical yearbooks of Huangshan City, the Tourism Bureau of Huangshan City and Mount Qiyun Scenic Spot, etc., and these data are quantified in accordance with the evaluating criterion; as for the qualitative indexes such as D9, D11, D13, D14, D15, these data are from the questionnaires sent to government officials of Xiuning County and Huangshan City; the qualitative index D12 derives from resident interviews; other qualitative indexes are from the questionnaires given out to tourists of Mount Qiyun. Among the 303 questionnaires, 258 were distributed to tourists and 45 to the relative government officials. 281 valid questionnaires were retrieved with the effective rate of 92.7%, which meets the validity requirement of questionnaires. After analyzing the above data with SPSS software and arranging the analyzing results according to the scoring criterion, we get all index scores in the index layer of development potential evaluation of transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex (See Table 3).

3.3. Evaluation results and analysis
We put the scores of all indexes in the index layer into the evaluation model of development potential of transformation & upgrading from a scenic spot to a tourism complex, and after step-by-step calculation, we got the evaluation results of development potential of the transformation & upgrading
from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex (Table 4). Table 4 shows the comprehensive evaluation result is 4.30, which indicates that there is big development potential in the transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex according to the evaluation grades of development potential of transformation & upgrading. Three out of the four elements in the comprehensive layer, i.e., conditions of tourism resources, development conditions of tourism complex and conditions of ecological environment are all higher than 4.4 in their values while only conditions of tourist source are below 4.0. The evaluation results illustrate that the scenic spot has superior conditions of tourism resources, tourism complex development and ecological environment but has relatively weak conditions of tourist sources, which is basically in line with the actual situation of tourism development in Mount Qiyun. The empirical analysis on Mount Qiyun Scenic Spot shows that Mount Qiyun possesses high-grade resources, good development conditions and admirable ecological environment. The fact is that Mount Qiyun is restrained by Mount Huangshan and Mount Jiuhua, e.g. the tourist reception quantity was only 615,800 in Mount Qiyun in 2012, much smaller than that in Mount Huangshan or Mount Jiuhua, but the average annual growth rate of tourists to Mount Qinyun in the past three years has reached 37.14%, and there is a good trend for tourism development in Mount Qiyun especially after the health care in Taoist culture is explored and the Taoist leisure & health tour with a huge market and a broad prospect is developed. The transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex is consistent with the development strategy of building Xiuning County as one of China’s health care centers [6].

**Table 4.** Evaluation results of development potential of transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Tourism Complex

| Evaluation elements | Conditions of tourism resources | Development conditions | Conditions of tourist sources | Conditions of ecological environment | Comprehensive evaluation result |
|---------------------|---------------------------------|------------------------|-------------------------------|-------------------------------------|-------------------------------|
| Score               | 4.52                            | 4.42                   | 3.53                          | 4.43                                | 4.30                          |

4. **Conclusion and discussion**
Firstly, this paper constructs a systematic, comprehensive and objective evaluation index system from the four aspects: development conditions of tourism complex, conditions of tourism resources, conditions of tourist source and conditions of ecological environment. The method of multi-objective linear weighted function is adopted in the construction of evaluation model of development potential of transformation & upgrading from a scenic spot to a tourism complex. The evaluation model is uncomplicated in form, perfect in theory, prominent in feature and practicable in operation.

Secondly, through the empirical analysis on Mount Qiyun scenic spot, it is shown that there are high-grade resources, good development conditions and admirable ecological environment in Mount Qiyun. Although Mount Qiyun is restrained by Mount Huangshan and Mount Jiuhua and its tourist reception quantity is relatively small, i.e. 615,800 in number, there is an apparent superiority of Taoist culture, which holds the potential of developing a leisure & health tourism complex. The evaluation results are consistent with the development goal of the local government, which, to some extent, verifies that the evaluation index system and the evaluation model constructed in this paper are applicable, reliable, maneuverable and valuable in science and promotion, which can provide reference for other tourism scenic spots. On the basis of the evaluation results of development potential, four points need to be taken into account in the transformation & upgrading from Mount Qiyun Scenic Spot to Mount Qiyun Leisure & Health Tourism Complex: first, exploring the value of tourism resources and formulating a specific theme; second, scientifically planning and optimizing spatial layout; third, developing innovative products and building the leisure & health tourism center with local characteristics; fourth, perfecting tourism service standards and strengthening tourist market promotion.
Thirdly, evaluating the development potential of transformation & upgrading from a scenic spot to a tourism complex is a complicated system project. This paper drew upon the research findings relevant to feasible evaluation systems of tourism resource development potential and of large theme parks in cities and consulted experts in related fields, trying to construct fully and creatively the index system. But there still exist some limitations in this index system. Therefore, further discussion and researches are needed to improve index system, e.g., to introduce more quantitative indexes and to represent more objectively the development potential of transformation & upgrading from a scenic spot to a tourism complex. Moreover, researches on different types of scenic spots need to be strengthened on the corresponding evaluation indexes and development paths in transformation & upgrading.

Acknowledgments
This work was financially supported by the key project of Humanities and Social Sciences Research of Universities in Anhui Province (SK2016A0884), National Natural Project (41571140), Educational project of Anhui Province (2015zdjy148), Research project of Huangshan University (zdxk201804, kypt201813)

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