Evaluation guide for green tourist cities

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Abstract. Green tourist cities are a kind of cities with unique resources such as unique natural sceneries or humanistic resources, can attract tourists. This paper puts forward an evaluation indicator system for measuring green tourist cities in 7 aspects of tourist resources, tourist services, infrastructures for tour, resource utilization and environmental protection, humanity, number of tourists and tourism revenue.

1. Introduction
A green tourist city generally has developed urban tourism industry, which is a main pillar industry thereof, and features rich and advanced tourist resources, tourist attraction, beautiful comprehensive environment, perfect supporting tourist facilities, a large number of tourists and high popularity. In order to promote the development of urban tourism industry and build tourist cities, China has promulgated many measures, and has been building and appraising and electing top tourist cities of China.

Green tourist cities are a kind of cities with unique resources such as unique natural sceneries or humanistic resources, can attract tourists, have certain tourist reception capacity, center on scenic spots, take the tourism industry as main industry, and record the output value of tourism industry exceeding 7% of GDP thereof.

The Evaluation guide for green tourist cities is a method system composed of a set of scientific and systematic evaluation indicators. And it is for the quantified calculation and scientific evaluation of construction achievements of green tourist cities. It is an action guide to the construction of green tourist cities, is specifically used to examine achievements of green tourist cities, and plays a role in leading, testing guidance, quantified evaluation, etc.

This paper puts forward an evaluation indicator system for measuring green tourist cities in 7 aspects of tourist resources, tourist services, infrastructures for tour, resource utilization and environmental protection, humanity, number of tourists and tourism revenue.

2. Basic principles for establishment of the evaluation indicator system of green tourist cities

2.1 Relevance principle
Indicators can approximately reflect some basic characteristics of a green tourist city in some aspect, to a certain extent and in a period.
2.2 Measurability principle
Indicators must be measurable, with data able to be obtained actually. Firstly, they mainly come from statistical materials of authoritative departments. In the condition of lack of statistical data, survey data can be used, as supplemented by expert evaluations in some circumstances.

2.3 Comparability principle
Indicators shall be selected in light of actual conditions of development of green tourist cities. Owing to comparison with other cities, the set indicators shall be universal and relatively comparable, thereby enhancing the scope of application of the indicator system.

2.4 Advancement and practicability principle
For one thing, indicators shall be selected from the perspective of the development trend of a city. The advancement of indicators shall be taken into account, so that each indicator can reflect the substantive characteristics, era features and future trend of the development of a green tourist city. For another thing, they shall be selected from the perspective of realities of a city, with the practicability of data information taken into consideration.

2.5 Comprehensiveness and simplicity principle
The profound and rich connotations of the development concept of the green tourist cities require that the indicator system should have a sufficient coverage so as to comprehensively and generally reflect all sides; and, it shall be avoided to select derived indicators with similar or repeated significance or which can be generated by the combination of other indicators. The indicator system shall be relatively brief and easy to be used.

3. Evaluation indicator system of green tourist cities

3.1 Basic requirements
An urban plan shall meet requirements for green, ecological and low-carbon development, or a city has prepared an urban plan as per green, ecological and low-carbon ideas; Main roads, pipelines, green land, waters and other infrastructures in a city shall have been constructed and put into use; Main public service facilities in a city shall have been constructed and put into use; A city shall have a monitoring or evaluation system covering major implementation and operation management data of a green tourist city;

The evaluation indicator system of green tourist cities shall principally include 7 types of indicators: tourist resources, tourist services, infrastructures for tour, resource utilization and environmental protection, humanity, the number of tourists and tourism revenue. Each indicator includes assessment items and scoring items. The result of assessment items is satisfaction or dissatisfaction, and the aggregate score of scoring items is 100 points. At the same time, 1 bonus point item of green development is set. The aggregate score of the bonus point item is 10 points.

The total points of the evaluation of green tourist cities may be calculated as per Formula (1).

\[ Q = \sum_{i=1}^{10} Q_i + E \]  

In which, \( Q \) is the total points of evaluation of a green smart city, with the aggregate score of 110 points;

\( Q_i \) is the points of all indicators; and

\( E \) is the score of the bonus point item.

3.2 Evaluation indicator system
GB/T 17775[1] may be referred to for the rating for quality of tourist attractions, and the evaluation indicator system of green tourist cities is indicated in Table 1.
### Table 1. Evaluation Indicator System of Green Tourist Cities

| Indicator | Item No. | Scoring standard | Point | Score | Remarks |
|-----------|----------|------------------|-------|-------|---------|
| **I. Tourist resources (15 points)** | | | | | |
| 1. | | Supports of the government for the planning and development of the green tourist city | | | |
| 2. | | Welcome given by urban communities to tourists | | | |
| 3. | | If the social resources of a city can effectively support the implementation of the tourism project of green tourist city; the score will be 5; in the case of partial support, the score will be 2; and, if the support cannot be provided effectively, the score will be 0. | | | |
| 4. | | If the natural resources of a city can be effectively developed and protected to support the implementation of the tourism project of green tourist city, the score will be 5; in the case of partial support, the score will be 2; and, if the support cannot be provided effectively, the score will be 0. | | | |
| 5. | | If the ecological environment of a city is effectively developed and protected, the score will be 5; if it is developed and protected partially, the score will be 2; and, if it cannot be effectively developed or protected, the score will be 0. | | | |
| **II. Tourist services (25 points)** | | | | | |
| 6. | | In respect of transportation services, urban traffic is convenient, airports, railways and navigation facilities are perfect; highways leading to scenic spots are distributed reasonably, greenways may be distributed like a net; parking lots are allocated reasonably, with adequate parking space; and, the coverage rate of vehicles reaches 100%. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 7. | | In respect of accommodation services, tourists are provided with perfect accommodation services, convenient living services and facility services. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 8. | | Regarding information services, a whole city is served by means of modern information technology, so that tourists can make use of information in a timely, effective and full way, and social living services of the city are improved. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 9. | | As for language services, information exchanges can be realized by virtue of language, and services are provided for a failure in language information conversion (owing to different dialects or interpretation demands of international tourism) or demands for language communications; tourist guides (interpreters) take a post with a license, their number and the languages used by them can meet tourist demands, and the standard conformity rate of Mandarin reaches 100%; tourist guiding (interpretation) words are scientific, accurate and vivid, and tourist guide service quality meets requirements in Clause 4.5.3 and Chapter 5 of GB/T 15971-1995[2]. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 10. | | In view of financial services, urban financial institutions can trade negotiable articles by monetary transaction means, and provide mutual-benefit and satisfactory services for participants of financial activities and tourists. Provided financial services include: insurance and relevant services, all banking and other financial services (except insurance); and, tourists can be provided with different convenient services such as financing and investment, savings, credit, settlement, securities trading, commercial insurance and financial information consulting. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 11. | | In respect of catering services, immediate processing, commercial sales and service-type labor are integrated to specially provide tourists with different convenient catering services including drink and food services. Catering services can be individualized and diversified; and, catering places meet requirements stipulated in GB10153 [3]. If all of the aforesaid requirements are satisfied, the score will be 4; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 12. | | As for medical services, characteristics of medical service products can be analyzed comprehensively and accurately, medical services are designed, provided, controlled and evaluated according to that, and the administration of medical service quality can be improved for the purpose of providing tourists with quality medical services. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 13. | | As for road traffic, roads are passable and smooth to facilitate entry and exit; there is the first-class highway, or high-grade channel or air route directly leading to the city, or there are vehicles for special tourist lines; there are special vehicle and ship parking places allocated reasonably, and with their capacity basically meeting demands, flat and solid floor or smooth waters, as well as standard and noticeable marks; tour (visit) routes or channels in scenic areas are basically allocated reasonably and smoothly. If all of the aforesaid requirements are satisfied, the score will be 4; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 14. | | In terms of entertainment facilities, they are allocated completely and basically satisfy demands of tourists; convenient entertainment activities are provided for tourists, and the facilities operate normally and have no hidden danger; and, amusement parks meet requirements in GB/T 16767 [4]. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0. | | | |
| 15. | | Concerning environmental sanitation facilities, including public environmental sanitation facilities, environmental sanitation engineering facilities and work places used by environmental sanitation institutions, environmental sanitation facilities are allocated reasonably, their quantities can meet demands, their marks are noticeable and beautiful, and architectural images are harmonious with landscape | | | |
environment; and, environmental sanitation facilities do not desquamate and are not dirty, air is fresh, and there is no noxious smell. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0.

17. In respect of rescue facilities, including automobiles and medical devices and drugs, facilities primarily preventing the suffocation of the injured or for artificial respiration, hemostasis by compression, binding splints for patients with fracture or prevention from distortion, they are complete, intact and effective; an emergency rescue mechanism is established, clinics are established, and medical personnel are arranged; an emergency treatment plan is set; emergency treatment capacity is strong, accidents are treated in time and properly, and archive records are accurate and complete. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0.

18. In respect of accommodation facilities, tourists are provided with convenient accommodation facilities; common accommodation facilities include hotels, family inns, youth hostels and home stay hotels; accommodation facilities are allocated reasonably, can meet demands in respect of quantity, are managed perfects, and are clean inside; If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0.

19. In respect of instruction facilities, different guidance signs (including tour guide panoramas, guide maps, signboards and scenery introduction boards) have distinctive shapes and match with landscape environment; signboards and scenery introduction boards are set reasonably; and, public information graphics symbols are set reasonably and designed delicately, are distinctive and artistic, and conform to provisions of GB/T 10001.1 [5]. All marks meet requirements for mark systems of 3A scenic spots set out in GB/T17775. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0.

20. In terms of shopping facilities, which are different facilities provided by a city for tourists, shopping places are allocated reasonable, and building shapes, colors and materials are distinctive and match with environment; shopping places are managed centrally, and are clean and in good order, and there is no encroachment for peddling or purchase of sales by force; there are unified management measures and methods for business personnel; and, tourist commodities are rich in varieties, and embody local characteristics. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0.

21. As for catering facilities, tourists are provided with facilities for catering of food, beverages and so on or public catering rooms; food sanitation conforms to the state provisions, sterilizing facilities are equipped with for catering services, and the disposable tableware leading to pollution is not used; and, catering facilities are allocated reasonably, places are clean, and the quantities thereof meet tourist demands. If all of the aforesaid requirements are satisfied, the score will be 3; if 60% are satisfied, the score will be 2; if 50% are satisfied, the score will be 1; otherwise, the score will be 0.

22. Unit GDP construction land area conforms to the planning and development of a green tourist city. The percentage of environmental protection investment in GDP meets the development requirements of a green tourist city. If the centralized treatment rate of domestic sewage reaches more than 80%, the score will be 4; if it reaches more than 60%, the score will be 2; and, if it reaches below 60%, the score will be 0.

23. If the leakage rate of water supply pipeline networks reaches below 20%, the score will be 4; if it reaches below 30%, the score will be 2; and, if it reaches above 40%, the score will be 0.

24. If the harmless treatment rate of domestic wastes reaches more than 80%, the score will be 4; if it reaches more than 60%, the score will be 2; and, if it reaches below 60%, the score will be 0.

25. If the cleaning rate of domestic wastes reaches more than 80%, the score will be 4; if it reaches more than 60%, the score will be 2; and, if it reaches below 60%, the score will be 0.

26. Energy-saving measures meet the development requirements of a green tourist city. Water-saving measures meet the development requirements of a green tourist city. Green education and practice can be developed and executed well, and meet the development requirements of a green tourist city.

27. If the free charge rate of public facilities reaches more than 80%, the score will be 4; if it reaches more than 60%, the score will be 2; and, if it reaches below 60%, the score will be 0.

28. If green travel accounts for 70% or above of all travel methods, the score will be 3; if accounts for 60% or above, the score will be 2; and, if accounts for below 60%, the score will be 0.

29. If protected materials other than cultural relics account for 80% or above of the total number of cultural relics, the score will be 3; if they account for 70% or above, the score will be 2; and, if they account for below 60%, the score will be 0.

30. The number of tourists can meet the development requirements of a green tourist city.

31. If the percentage of the number of tourists in the total number of city residents reaches 5% or above, the score will be 5; if it reaches 3% or above, the score will be 3; and, if it reaches below 1%, the score will be 0.

32. Tourist consumption structure is reasonable, and can propell the development of a green tourist city.

33. Tourist products are rich, and can meet the development of a green tourist city.

34. If the percentage of tourism revenue in the GDP of the city reaches 5% or above, the score will be 5; if it reaches 3% or above, the score will be 3; if it reaches 2%, the score will be 2; and, if it reaches below 1%, the score will be 0.

35. If the percentage of the number of tourists in the total number of city residents reaches 5% or above, the score will be 5; if it reaches 3% or above, the score will be 3; if it reaches 2%, the score will be 2; and, if it reaches below 1%, the score will be 0.

36. If the percentage of tourism revenue in the GDP of the city reaches 5% or above, the score will be 5; if it reaches 3% or above, the score will be 3; if it reaches 2%, the score will be 2; and, if it reaches below 1%, the score will be 0.
ent (10 points) resources, economy, social governance and information construction has been fully surveyed and evaluated, the score will be 2; if parts of the requirements are met, the score will be 1; otherwise, the score will be 0.

40. If the business structure, infrastructure structure, safety system and standard system of a green tourist city have been defined, the score will be 2; if parts of the requirements are met, the score will be 1; otherwise, the score will be 0. 2

41. If main tasks, operation modes, implementation routes and guarantee measures of green tourist city construction have been analyzed and evaluated, the score will be 2; if parts of the requirements are met, the score will be 1; otherwise, the score will be 0. 2

42. If construction has been conducted in strict accordance with the green tourist city planning scheme, and implementation completion rate has been rising year by year, the score will be 4; if parts of the requirements are met, the score will be 2; otherwise, the score will be 0 [6-7]. 4

4. Important indicator evaluation methods

4.1 Social resources of a city
All objects, which can be provided by a city and transformed into specific services so as to meet demands, can be called social resources of a city. Tangible resources include manpower (employees, consultants, volunteers, etc.), material resources (equipment, furniture, articles for use, etc.), financial resources (private donations, government subsidies, enterprise sponsorship, etc.) as well as floor space. Intangible resources include technologies, knowledge, organization and social relations.

4.2 Natural resources of a city
Natural resources are a generic term of natural environment factors that can generate economic value and enhance the current and future benefits of human beings under technological conditions and in a certain time. Natural resources of a city can be classified into renewable resources, renewable natural resources and non-renewable resources. Natural resources of a city include: biological resources, agricultural resources, forest resources, territorial resources, mineral resources, marine resources, weather and climate and water resources.

4.3 Ecological environment of a city
The ecological environments of a city are composed of natural environment, social economy, culture, science and technologies, and include buildings and other facilities as urban development foundations, and residents as urban subjects and activities thereof. Investigation objects of the ecological environment of a city include: the rate of reaching standards of drinking water sources and quality, the percentage of days with good air quality or better, the coverage rate of regions with environmental noises reaching standards, per capita public green land area, the harmless treatment rate of domestic wastes as well as the comprehensive utilization rate of industrial solid wastes.

4.4 Financial services
Financial institutions of a city trade negotiable articles by monetary transaction means, and provide mutual-benefit and satisfactory services for participants of financial activities and tourists. Providers of financial services include institutions of the following types: insurance and relevant services, all banking and other financial services (except insurance services).

4.5 Medical services
Medical services, as a kind of services, have several characteristics. The scientific, comprehensive and accurate analysis of characteristics of medical service products, and the design, provision, control and evaluation of medical services according to that, are of profound significance for improving the administration of medical service quality and providing tourists with quality medical services.

4.6 Road traffic facilities
Road traffic facilities include necessary vehicles (such as automobiles, ships and planes), mechanical equipment, sites, lines, communication equipment, signal marks, and houses (including stations, warehouses, waiting areas and ticketing sites), in road traffic. According to the need of traffic flow and terrain and ground object conditions, pedestrian bridges (including underground pedestrian
crossing), fences, lighting facilities, sight guidance marks, emergency communication facilities and other similar facilities shall be set on roads when necessary. Provisions on road traffic guidance marks in tourist attractions in DB34/T 3000 shall be followed.

4.7 Tourist consumption structure
Tourist consumption structure refers to the percentages of different types of tourist products and relevant consumption goods consumed by tourists during travel. Tourist consumption is classified into survival consumption, enjoyment consumption and development consumption. Specifically, the tourist consumption during travel is also classified into the consumption in respect of catering, entertainment, tour, accommodation, traffic. In particular, the consumption in respect of food, living and traffic meets physiological demands of tourists during tour; and, the consumption in respect of viewing, entertainment, learning and so on meet demands for spiritual enjoyment and intelligence development of tourists.

4.8 Tourist products
Tourist products, also called tourist service products, are composed of material objects and services. They include scenic spots, and traffic, accommodation and entertainment facilities provided by travelling salesmen together, travelling routes with items and corresponding services sold to tourists, and activities provided by tourist attractions, tourist hotels and other individual enterprises for tourists. The features include comprehensiveness, intangibility, synchronicity of production and consumption, non-storability, the non-transferability of ownership and so on.

5. Conclusion
Green tourism is an important driving force for the economic and social development of cities, and "development" is the sustainable theme of green tourism cities in the future. Green tourism requires the green development of the whole region of tourism, with the integration and symbiosis of human and nature as the theme, taking account of the major elements of tourism, formulating green development planning, and establishing green tourism certification and supervision. This paper attempts to establish the evaluation index system of green tourism city, aiming at providing technical support for the construction of green tourism city and sustainable basis for the evaluation of green tourism city, which is of guiding significance for the construction of green tourism city in China[8-13].

References
[1] GB/T 17775 Standard of rating for quality of tourist attractions
[2] GB/T 15971-1995 Quality of tour-guide service
[3] GB 16153 Hygienic standard for dining room
[4] GB 16767 Safety and service quality in the amusement park
[5] GB/T 10001.1 Public information graphical symbols for use on sign--Part 1: Common symbols (GB/T 10001.1-2000, neq ISO 7001:1990)
[6] GB/T 51255-2017 Assessment standard for green eco-district
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