A COMPREHENSIVE FUZZY COMMENT ON TOURIST RESOURCES OF THE TOURIST AREAS

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Abstract

This paper is trying to discuss the application of the synthetical fuzzy method to the evaluation of the tourist resources of the tourist areas, and to highten the scientific level of this commenting work. Finally, the two conclusions are obtained, which are: the direction of developing the tourist resources must be fit for the particular kind of the tourist area and the rank of developing the tourist area must be fit for the totality of the tourist resources.

1. Introduction

Tourist resources are the material base of formation and value of the tourist areas, therefore, the material base of the development of tourism. A scientific evaluation of the tourist resources, which concerns the procedure, scale, direction and architectural form of the development of the tourist areas, will supply a theoretical basis on their rational development.

In comparison with other binds of resources, the tourist resources are more outstanding on relativity. There lacks the quantitative idea of absolute unity in the ambiguous comment of "good or bad" series of notion. And among the factors of the tourist resources in the tourist areas, many are difficult to be quantized or can not be quantized at all. Even if some of them can be quantized, they cannot be synthesized or calculated because of the different quality.

2. Tourist Resources Evaluation Index System

We call these places or districts tourist areas, which contain certain economic value of tourism and have lost of tourist facilities. And the various characteristics and functions of the tourist areas are decided by the different material basis of the sceneries of the areas. Therefore, thhe tourist areas may be roughly classified into

the following types:

the tourist area of natural scenery; the tourist area
of historical sites; the tourist area of commemoration
the tourist area of culture and custom; the tourist
area of modern construction; the synthetical tourist
area.

The tourist resources of the tourist areas = {the
scenic type of the weather and climate; the scenic type of
the geology and geomorphology; the scenic type of the
water area; the scenic type of the animals and plants; the
scenic type of the revolutionary sites and construction;
the scenic type of the historical sites; the scenic type
of the national customs and sight of cities and villages}

The scenic type of the weather and climate = {the
sunrise, the sea of clouds, snow, mist and temperature },

the scenic type of the geology and geomorphology = {
peaks, rocks, caves, beaches, glaciers, sanddunes, fossils
the moulding geomorphology and the ruins of earthquakes},

the scenic type of the water areas = {lakes, beaches,
springs, waterfalls, reservoirs, rivers, brooks and ponds},

the scenic type of the animals and plants = {forests,
rare animals, grasslands, green shade and lands, old trees
flowers, rare trees, ornamental fishes and snakes and
birds and animals },

the scenic type of the revolutionary sites and con-
structions = { former residences and graves of the revolu-
tionaries, the ruins and old sites of revolution, monu-
ments and cemeteries of the martyrs, and places where he-
roes gave their lives for the country },

the scenic type of the historical sites = { ancient
ruins, imperial gardens and palaces, stone statues, steles
inscriptions, couplets written on scrolls and hung on the
pillars a hall, frescous, grottoes, unearthed artifacts,
the Great Wall, bridges, pagodas, mausoleums, pillars, un-
derground palaces, temples, halls, buildings, ponds walls,
pavilions and ancient tombs },

the scenic type of the notional customs and sight of
cities and villages = { customs, dresses, folk arts, cities
industrial enterprises, modern buildings, idyllic thatched
cottages }.

3. Mathematics Model

The evaluated procedure is as follows:

Let C_s (s=1—6) denote the six types of the tourist
areas.

Let A_i (i=1,2,....,7) denote the seven scenic types.

Let $b_{ij}(i)$ (i=1,2,...,7;j=1,2,...,j(i)) denote sixty
eight scenic factors, which constitute the seven scenic

types.

The domain is composed of the scenic factors:

$$U = \{ bij; \ i=1,2,\ldots,7; j=1,2,\ldots,j(i) \}.$$

Let V be the evaluation grade set, i.e., $V = \{$ development of state, province, local, and not develop for the time being now $\}$.

To Cs, the significance of Ai is different, let the weights set be: $K^S = (K_1^S, K_2^S,\ldots,K_7^S)$ (s=1—6).

To Ai, the significance of Ai is different, we give the different weights Pij, let the weights set be:

$$Pi = (\ Pi1, Pi2,\ldots,Pij(i) \ ).$$

We claim: $o = K_i^S = 1, \ o = Pij = 1, \Sigma K_i^S = 1, \Sigma P_{ij} = 1.$

On the basis of above mentioned, we follow the steps below to compute tourist resources evaluation.

1) Choose one element of mark set for each evaluation factor b_{ij} (i=1,2,\ldots,7; j=1,2,\ldots,j(i))

Each expert in tourist resources evaluation groups choose any one element of mark set V for each evaluation factor b_{ij}, then calculate subordinate degree of each mark of b_{ij}, i.e., the proportion of each mark of b_{ij}

$$r_{ij} = (\ r_{ij}^1, r_{ij}^2, r_{ij}^3, r_{ij}^4 \ ) \ i=1,2,\ldots,7, \ j=1,\ldots,j(i)$$

where r_{ij}^n(n=1,2,3,4) are on behalf of the proportions that mark of b_{ij} is development of state, province, local, not develop for the time being now respectively.

2) Determine the mark of each evaluation index $A_i (i=1, 2,\ldots,7)$

$$R_i = \begin{bmatrix} r_{i1} \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ r_{ij(i)} \end{bmatrix} = \begin{bmatrix} r_{i1}^1 & \cdots & r_{i1}^4 \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ r_{ij(i)}^1 & \cdots & r_{ij(i)}^4 \end{bmatrix} \qquad i=1,\ldots,7.$$

We make fuzzy matrix opration of R_i and P_i, and obtain evaluation result for A_i:

$$M_i = P_i \circ R_i$$

$$= (\overset{j(i)}{\underset{j=1}{V}} (P_{ij} \wedge r_{ij}^1), \ \ldots \ , \ \overset{j(i)}{\underset{j=1}{V}} (P_{ij} \wedge r_{ij}^4))$$

$$= (\ m_{i1}, \ m_{i2}, \ m_{i3}, \ m_{i4}) \quad i=1,2,\ldots,7,$$

where m_{i1} represents the proportion that mark of A_i is development of state.

3) Determine mark of the tourist area C_s

We eatablish the tourist area evaluation matrix of C_s

$$M = \begin{bmatrix} M_1 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ M_7 \end{bmatrix} = \begin{bmatrix} m_{11} & \cdots & m_{14} \\ & \cdots & \\ & \cdots & \\ & \cdots & \\ & \cdots & \\ m_{71} & \cdots & m_{74} \end{bmatrix} ,$$

then make fuzzy matrix operations of K^S and M and obtain evaluation result of Cs

$$N^S = K^S \circ M$$

$$= (\bigvee_{i=1}^{7} (K_i^S \wedge m_{i1}), \ldots , \bigvee_{i=1}^{7} (K_i^S \wedge m_{i4}))$$

$$= (n_1^S , n_2^S , n_3^S , n_4^S).$$

4) Determine of the direction and rank of developing of a tourist area

To the comment $N^S = (n_1^S , n_2^S , n_3^S , n_4^S)$ ($s=1$——6) of the six types groups of the tourist areas C_s, we make the following analysis:

In any one C_s, $s = 1,\ldots,6$, it must be known that there is a C_{s_0} ($1 \le s_0 \le 6$) or not, so that there is $n_1^{s_0}$ $n_i^{s_0}$($2 \le i \le 4$), where $n_1^{s_0}$ indicates state development.

If there is only one s_0 satitisfied the demands, then developing direction and rank of this tourist area will be C_{s_0}: state development (for instance n_1^1, state develop- ment and the type of natural scenery). If there are D ($1 \le D \le 6$) of s_0 satisfied the demands, we must compare these n_1^S, if there is a maximum of number (for instance n_1^3), the developing direction and rank will be the max- imum of number (n_1^3, $s = 3$) corresponding C_S (the type of the commemoration — state development), if there is same ' E ' ($2 \le E \le D$), and is bigger than other ' D -

E ', this tourist area will be state developing, the rank may be any one of the ' E ' or be all ' E '. If there are not, we'll analysis whether to have a s_0, so that there is $n_2^{s_0} < n_i^{s_0}$ (i = 1,3,4), where $n_2^{s_0}$ indicates provincial development. According to the same train of thought, directions and conclusions of provincial development, local development, not develop for the time being will be obtained.

References

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