



Extension Analysis of Ecological Engineering Management of Tourist Area

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Abstract

In our study, we explore the extension analysis of ecological engineering management of the tourist area. And the primary goal in ecological engineering management is to realize the sustainable development of the tourist area. We set targets for the sustainable development of the tourist area on the basis of the analysis on the current situation. And then we build up target and condition matter elements of the sustainable development of the tourist area using the matter element theory of Extenics, and give divergent analysis, correlation analysis, contains analysis, conjugate analysis for them. The extension analysis can provide us with several feasible new ideas on the ecological engineering management.

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Keywords: Tourist area; Ecological engineering; Extension analysis; Sustainable development

1. Introduction

In recent years, with the improvement of people's living standard, the tourism industry has got a thriving growth, and plays an increasingly important role in the world economies. However, many serious problems occur at the same time. For instance, tourism resource has been destroyed severely; the environment has been heavily polluted, and the local traditional culture has been adversely affected. Thus ecological engineering management of the tourist area is becoming an increasingly urgent and important task. Ecological engineering is a study of integrating ecology and engineering, concerned with the design, monitoring and construction of ecosystems. And the sustainable development is an allimportant part of the ecological engineering management.

Tourism sustainable development is a kind of development which meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs. It requires that the exploitation and construction of the tourist area must be integrated with the protection of the environment and the effective utilization of the resource. Sustainable tourism has attracted great attention^[1-3]. Tosun^[4] analysed the challenges to sustainable tourism development in developing countries with special references to Turkey as a part of the developing country. Some researchers explored ways in which political obstacles inhibit the formulation and implementation of sustainable tourism development in small-island developing states through the example of North Cyprus^[5]. It also argued that a correct supply of public goods may contribute to achieve sustainable development throughout time in

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tourism municipalities [6]. Some other researchers investigated the solutions to implement tourism sustainable development. Sigala [7] showed the applicability and usefulness of supply chain management (SCM) as a critical management tool for ensuring sustainability during all stages of tourism supply chain (SC) by analyzing the case study of TUI. Other researchers proposed a simple and general methodology for sustainable tourism enterprises, and the methodology consists of an initial audit, the selection of objectives and solutions proposed, the application of the selected solutions, an economical evaluation and a review of the obtained results [8].

Extenics is a boundary subject proposed by Cai Wen [9], a Chinese scholar, and it employs extensible method to seek the possibility of extending the research targets and then regulation to create is proposed. The extension analysis has been widely used. Li [10] applied the extension analysis method in the evaluation of security for high technology industry. Zhao [11] explored the evaluation of strategies for improving client’s value based on extension analysis, and finally got an excellent strategy for the improving of client’s value. And some other researchers used extension analysis to adjust the industrial structure of rural economy [12]. The extension analysis was also used in the demand predetermination of the energy resources [13] and the risk assessment of urban power network planning in china [14]. In our study, we tend to apply the extension analysis in the tourist area sustainable development, so that we can get some formalized and neoteric ideas which can provide support in decision-making for the sustainable development of the tourist area.

2. Targets and conditions matter element of sustainable development

An ordered triad $R = (N, c, v)$ is used as the primary logical unit to describe things in extenics, and the ordered triad is also called primitive matter for short, where N indicates that the name of the object /action /relation, c is the characteristic of N , $v=c(N)$ indicates the value of the feature c for N (the value can be both quantity value and non-quantitative value). If the N has n particularities, c_1, c_2, \dots, c_n , and the value of each particularity are denoted by v_1, v_2, \dots, v_n . The primitive matter includes matter element, affair element, and relation element, and it can be expressed by the following matrix form R as follows.

$$R = \begin{bmatrix} N, & c_1 & v_1 \\ & c_2 & v_2 \\ & \dots & \dots \\ & c_n & v_n \end{bmatrix} = (N, C, V) \quad \text{or} \quad R = \begin{bmatrix} N & c_1 & \dots & c_n \\ & v_1 & \dots & v_n \end{bmatrix}$$

Tourism sustainability includes tourism economy sustainability, tourism ecological environment sustainability, and tourism society sustainability. Tourism economy sustainability refers to develop economic benefit of the tourist area and promote its sustained economic growth under the premise of maintaining the other two aspects unaltered; tourism ecological environment sustainability is namely the sustainability of tourism resources environment, and it requires that the development of tourism must be based on the existing tourism resource and environment, i.e. tourism resource should be consumed effectively and tourism environment should be protected and improved, and must not exceed the environmental bearing capacity; tourism society sustainability consider that the development of tourism should be in step with the social progress, and aims at enhancing the life quality of the local residents in the tourist area and the protection and promotion of local traditional culture and custom.

Then we get the target of the sustainable development of the tourist area N : tourism development should boost the development of economic, offer more employment opportunities for the local people in the tourist area, and improve their life quality; we should develop the tourism site and protect the environment simultaneously, and tourism site should be developed and planned reasonably; we should stress the need of ecological environment protection of tourist area, and optimize the allocation of human resource. In line with the scale and the operation and development circumstance of the tourism site, we assume that the annual revenue of the tourist area should be reach v_1 thousand, v_2 jobs can be offered to the local residents and getting v_3 employees with high professional competencies. The target matter element R_0 and the conditions matter element I_0 are showed below:

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