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Empirical Research on the Sustainable Development of Ecotourism with Environmental Education Concepts

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Abstract: Most governments, local organizations, tourism agents, and scholars have extensively promoted ecotourism in recent years. However, government policies have been ignored, public opinion has not been updated, the local tourism infrastructure is incomplete, and operational practices have been poor for a long time. This is because ecotourism has not made any empirical profits, and additionally, it has even incurred more practical costs, which have encouraged few tourism agents to execute and operate ecotourism correctly. The contributive findings of this study are the following: (1) Beyond the evaluated measurements of quantitative and qualitative analyses, the sustainable development of ecotourism essentially creates benefits for the local industry and the environment, and actively assists the industry in improving the business environment, in enhancing service quality, and in creating ecotourism benefits. (2) It is very apparent that the tourism offices of central and local governments, as well as related travel agents and local organizations, have to be trained with regard to the appropriate consumption of sightseeing products, with a consideration of productive yield and a critical focus on quality instead of quantity. Particular attention should also be given to local traveling capacity as well as support for regional development. The maintenance of the local cultural landscape or ecological integrity can directly offer tourists an unprecedented travel experience, which could encourage them to share their knowledge with others in society after traveling, and consequently promote the sustainable development of ecotourism. (3) The results point to the fact that the tourism offices of central and local governments, related travel agents, and local organizations require training in providing special assistance to local residents with regard to the conservation of natural resources. Special training must likewise be provided concerning environmental protection, allowing them to educate the tourists in terms of politely respecting local traditions, norms, and cultures while traveling, since these activities are directly related to the sustainable development of ecotourism. Predictably, beyond this research, these three contributive findings can directly become the research foundation of future works that intend to focus on the sustainability of global ecotourism.

Keywords: sustainable development of global ecotourism; environmental education concepts; social cognition theory (SCT); environment society governance (ESG)

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1. Introduction

In recent years, with the continuous occurrence of environmental pollution events (such as high soil eutrophication and subsidence of groundwater) and ecological catastrophes (such as forest fires and heavy rain and torrents) around the world, the Earth's

environment and ecology have been facing major challenges. Furthermore, with respect to the rapid development of transportation technology (especially in the aviation and high-speed rail industries), global tourism has entered an unprecedented peak period, especially in the post-COVID-19 period, during which the amount of retaliatory domestic and foreign tourism surged. Therefore, under the high impact of hyper-tourism, the question of how to achieve a triple balance among environmental conservation, cultural preservation, and economically profitable growth in order to achieve sustainable ecotourism has become the most important concern and research subject of all governments, tourism-related industries, regional organizations, and ecotourism researchers. In fact, the majority of people have directly considered environmental protection when traveling, or green travel, because both ecological and environmental protection have been deemed to be the best final goal of ecotourism for a long time. As a result, most global ecotourism researchers have paid more attention to ecological conservation and environmental protection-related research fields, and more local governments have begun to not only institute a series of regulations, rules, and policies, but also to offer the funds needed to establish civic society organizations devoted to the implementation of ecological conservation and environmental protection [1]. In particular, increased sustainability and sustainable development have been misunderstood in ecotourism. Governments and regional organizations have implemented this by allowing tourists to go to the wild to see animals, to visit beautiful natural landscapes to see the scenery, or to experience foreign culture by watching music and dance performances; even hunting with aborigines can be called the development of sustainable tourism on the way to reaching ecotourism. The extreme expansion of the forms of ecotourism is almost all-encompassing and omnipresent. This is probably the understanding of our government's tourism department. The critical point is that most governments and local governments have aimed to just maximize the local economy and tourism capacity; with this, ecotourism is then expected to reach developed sustainability because the outcomes will support the lack of ecotourism achievement. In order to achieve the developed sustainability of ecotourism, the level of environmental protection and ecological conservation is constantly sacrificed, especially in the pursuit of developing the regional economy and tourism industry. In terms of satisfying the preferences of a large number of tourists, a lot of regional organizations have begun to develop a large number of sightseeing orchards and farming activity experiences. This has resulted in the use of chemical pesticides and fertilizers in orchards and farmland to protect the production of crops and agricultural products, with the aim of obtaining the best price for tourists. Moreover, in order to satisfy the needs of a large number of tourists, the government has begun to develop large-scale regional transportation and residential areas in order to attract a large number of tourists who would be willing to visit and stay in the area longer. This could then lead to ecological damage and catastrophe, especially brought about by the large number of tourists, visible garbage pollution, and invisible noise and air pollution, among others [2]. Furthermore, ecotourism has not been improved by the development of tourism; on the contrary, ecotourism has declined because of the development of tourism. For this reason, and in order to satisfy the tourists' demands and needs, local industries have been adjusted. For example, fruit farmers have to use high levels of pesticides and chemical fertilization methods to ensure the plumpness and sweetness of the fruit, which would then meet the needs and expectations of tourists in the tourist orchards they visit and harvest. Consequently, the soils and environment that have been subjected to high pesticide and chemical fertilization methods for a long time will produce a high amount of chemical pollution, which will have a major and irreversible impact on the local ecological environment. Additionally, according to the requirements of the tourism industry, local craftsmen have altered the unique designs or traditional manufacturing processes of the original handicrafts they produce into simpler designs with a large amount of mechanization. This has promoted the loss of cultural originality and cultural inheritance, which eventually forms tourists' perception of the local area. At present, inheritance of the craft culture produces a certain

degree of misunderstanding and is not cherished, which then makes the original crafts inherited from the local culture pale in comparison.

Therefore, economic growth still dominates and influences the development of environmental conservation and cultural preservation, which has resulted in extremely unbalanced relationships among economic growth, environmental conservation, and cultural preservation in the current development of sustainable ecotourism [3]. On the other hand, in the current situation where there is often ambiguity in cognition and a large space for interpretation, everyone speaks differently and plays their own tune, thus causing the current chaos in ecotourism. Particularly, all current definitions of the sustainable development of ecotourism only refer to principles, concepts, and ideology. These include questions on how to execute "leader accountability" (what responsibility, to whom, who is responsible, how to be responsible); how to disturb the "developed benefits" (how big is the environmental protection, what are the benefits for ecological conservation, how to ensure that the distribution of benefits to each resident is fair, whether the interests are global or individual); how to implement the "appreciated attitudes" (what method and degree can be deemed as sustainable methodology); and how to reach the "extreme possible" (how far and how deep are the efforts to reach the triple balance).

In order to make the definition clearer and provide a clearer picture of how to take part in ecotourism in general, it is necessary to integrate educational practice into the basic definition of continuous tourism, limit the space for everyone to explain themselves, and correctly define ecotourism as achieving the triple balance among environmental conservation, cultural preservation, and economically profitable growth, thus making tourism become a kind of life attitude that is friendly to the triple balance. Clearly, the sustainable development of ecotourism also has to allow tourism operators and tourists to acquire knowledge of these elements first-hand through the process of operation or experience, in order to cultivate a particular life attitude related to ecotourism. This would benefit human beings as well as natural resources and other "all beings", such that human beings and nature can prosper together, and the Earth's environment and resources can really be sustainably developed.

Consequently, how to achieve the triple balance among environmental conservation, cultural preservation, and economically profitable growth in order to achieve the sustainable development of ecotourism has been a mainstream research subject in global ecotourism-related fields. For this reason, this research innovatively and interdisciplinarily employs the up-to-date environmental, social, and governance (ESG) guidelines of the sustainable development concept to perform an in-depth assessment of the sustainable development of ecotourism. ESG was initiated to concretely implement the principles of corporate social responsibility (CSR) and to further evaluate the sustainable development indicators of an organization from the environmental conservation, society preservation, and governance benefits (ESG) dimension. In detail, the environmental conservation (E) part of ESG was designed to deal with the prevention and control of environmental pollution such as greenhouse gas emissions, water and sewage management, biodiversity, etc. Society preservation (S) was innovated to cope with customer welfare, labor relations, diversification and inclusion, and other aspects of stakeholders that are affected by the sales industry. Finally, the governance benefits (G) part of ESG was created to handle business ethics, competitive behavior, supply chain management, etc., which are related to a company's sustainable stability and development. Therefore, the E of the ESG has been employed to appraise the outcomes of environmental conservation, the S has been applied to evaluate the efforts made in cultural preservation, and the G of the ESG has been utilized to assess economically profitable growth.

However, how can the interaction and mutual dependence of the triple balance among environmental conservation, cultural preservation, and economically profitable growth be analyzed in global ecotourism? The triadic interaction of social learning theory (SLT) [4] was employed to perform an in-depth and comprehensive evaluation of the stated interaction and mutual dependence of the triple balance elements in global ecotourism in

order to induce what we call the most core sustainable development of ecotourism with environmental education concepts (MCSDEEC). The most important reason for this is that the SLT was created to analyze the triadic interaction of three essential aspects: personal cognition (PC)—individualism; personal action (PA)—behaviorism, and society identification (SI)—environmentalism [5,6]. At present, the PC of the SLT conforms to the E of the ESG, matching the appraisement of the outcomes of environmental conservation due to the recent heightening of public awareness of the need for environmental conservation. The PA of the SLT corresponds to the S of the ESG, supporting the evaluation of the efforts in cultural preservation to maintain tourism. The SI of the SLT contains the G of the ESG, which deals with economically profitable growth with respect to maximal economic development under the natural restrictions of local tourism. Based on the created concept of the SLT, most human behaviors have resulted from environmental conditions. An in-depth and comprehensive discussion and evaluation can thus be performed on the sustainable development of global ecotourism by means of the sustainability of the ESG, and the triple interaction and mutual dependence of the SLT; in particular, an educational concept is included and considered in order to powerfully enhance the change in human behavior. This would directly enhance the triple balance in achieving the sustainable development of global ecotourism, as illustrated in Figure 1.

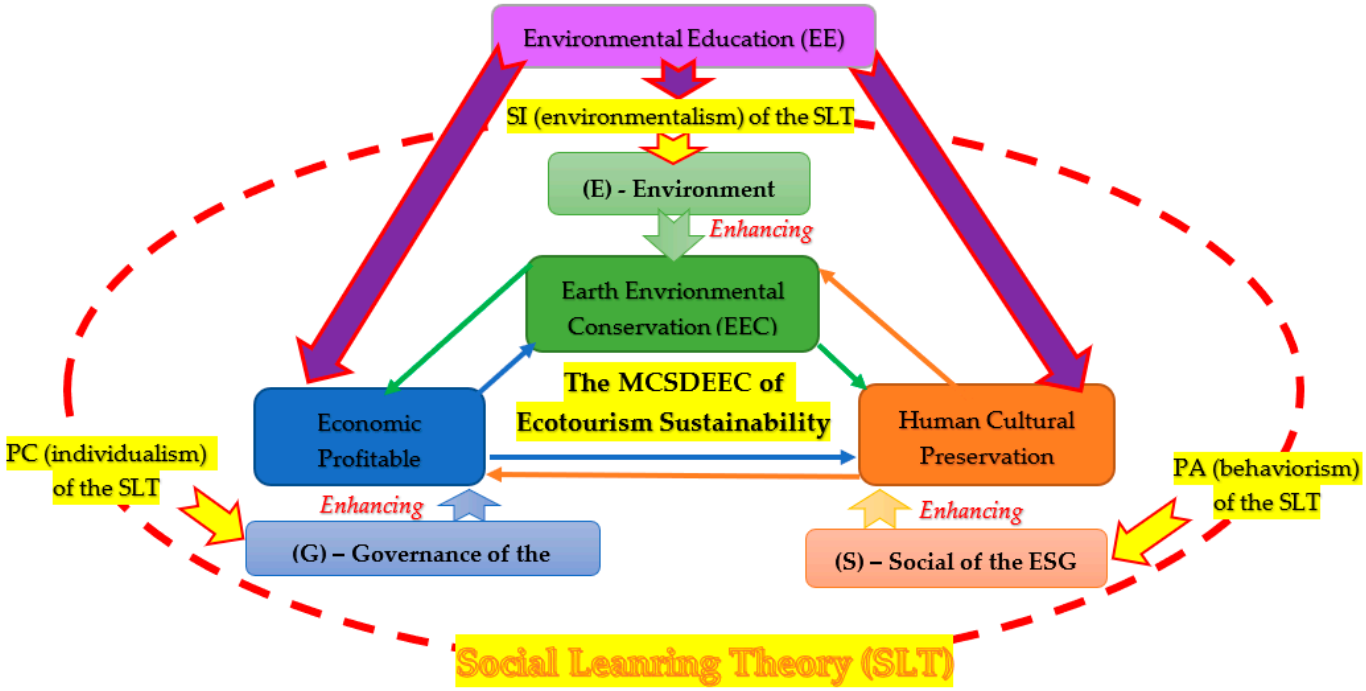

Figure 1. Main research concept.

In order to strengthen the research's validity, accuracy, and representativeness of large-scale questionnaires, factor analysis (FA), as employed in quantitative analysis, was firstly applied in order to assay large-scale weighted measurements. Subsequently, in consideration of the greater research reliability, exactness, and professional character of the experts' questionnaires, the analytical network process (ANP) in qualitative analysis was further employed to analyze the expert's weighted measurements. Specifically, this research creatively consolidated the measured consequences into the assessed measurements of the ANP of qualitative analysis in order to formulate the research topic: An Empirical Research on the Sustainable Development of Ecotourism with Environmental Education Concepts.

2. Literature Reviews

2.1. Literature on Main Modern Concepts

In order to perform an in-depth exploration of the research topic, a definition of ecotourism first had to be determined. Initially, it was Dr. Hetzer, a German professor working at the University of California, Berkeley, who proposed the term "Eco-Tourism" in 1965. He proposed to (1) try to reduce the human impact on the environment, (2) respect the local culture and try one's best to adhere to the four principles of reducing impact, (3) give back local economic benefits as much as possible, and (4) give tourists the best recreational experience. He was devoted to promoting his concept of creating more responsible tourism activities for the sake of environmental protection, ecological conservation, and local economic development. After his publication, the majority of national governments all over the world began to devote themselves to the research and promotion of ecotourism, deriving and incorporating more expectations and responsibilities with respect to various definitions, guidelines, and principles, which probably could not be separated from Hetzer's original concepts, especially in the tourism academia. According to the "Oslo Declaration on Ecotourism" from the 2007 Global Ecotourism Conference of the United Nations, ecotourism emphasizes the important role of the protection of natural and cultural heritage, calling on all stakeholders to use this declaration to assess the current status of ecotourism in each region and the various challenges it faces. This manifesto also represents the best official document for understanding the definition of ecotourism. Afterwards, in 2015, the International Ecotourism Society (IES) integrated current ecotourism concepts to expand the traditional definition of the term "ecotourism" to the following: "Ecotourism is a kind of responsible tourism that takes into account environmental protection, maintains the well-being of local residents, and requires explanations and explanations." The connotations of industry and tourist education apply to the relevant tourism organizations. Meanwhile, "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" applies to all tourists. Additionally, the International Union for Conservation of Nature (IUCN) defines ecotourism as follows: Environmentally responsible travel to secluded natural areas to enjoy and experience nature (and the accompanying cultural identity, whether past or present), which includes the promotion of ecological conservation, low visitor impact, and providing the benefits of the active socioeconomic participation of local residents. The current concrete definition of ecotourism describes it as "a tourism business or experience mode based on the three cores of environment (humanities and nature), society (ethnic group and community), and economy (local and sustainable)." More importantly, the interaction and mutual dependence of environmental conservation, cultural preservation, and economically profitable growth have since been defined in relation to the sustainable development of ecotourism [7–10].

In order to carry out an in-depth assessment of the sustainable development of ecotourism, the ESG sustainable concept was utilized in the evaluation structure in this research, because the ESG was designed for the inspection of organizational sustainability. In this respect, financial performance has been used as the main critical index representing the overall performance of a company. However, the current organizational performance was needed in order to be able to evaluate the internal and external performance of the organization. An organization does not only need to have outstanding financial performance and take good care of its employees and shareholders, but it also needs to undertake more social responsibilities. The size of the company is not the only factor; it needs to be bigger, but also to achieve sustainable operation and development for a long time. The ESG is a performance indicator used for measuring organizational operations, which includes internal and external evaluation standards that the public can refer to, while the sustainable development of ecotourism has become a more detailed guideline. When the two are closely combined, they will drive organizational growth and create more social well-being. In detail, the E of the ESG refers to environmental protection: organizations have to pay more attention to environmental sustainability issues, covering greenhouse gas emissions,

carbon emission reduction, climate change, environmental sustainability, carbon emissions, pollution treatment, etc. [11]. The S of the ESG refers to social responsibility; this includes how the company manages its employees, suppliers and customers, as well as the working environment, information security, suppliers, community programs, etc. [12]. Finally, the G refers to organizational governance: this covers topics such as senior management, executive compensation, auditing, internal control, shareholder rights, corporate ethics, information transparency, diversity of directors, and corporate compliance [13].

According to the SCT of the learning and education theory used in psychology, education, and communication, some portion of an individual's knowledge and behavior acquisition can be directly related to the observation of others in the context of social interactions, experiences, and external media influences. The SCT was developed by Albert Bandura as an extension of his social learning theory. More specifically, it is the triadic interaction of the three essential PC, PA, and SI aspects; that is, the theory that learning is essentially affected by reinforcement and punishment, which changes the probability of the occurrence of the behavior. In detail, the triadic interaction of the SCT mainly involves human behavior that is based on interactions and mutual influence among the individual (person), their behavior (behavior), and the environment (environment), as illustrated in Figure 2 [14].

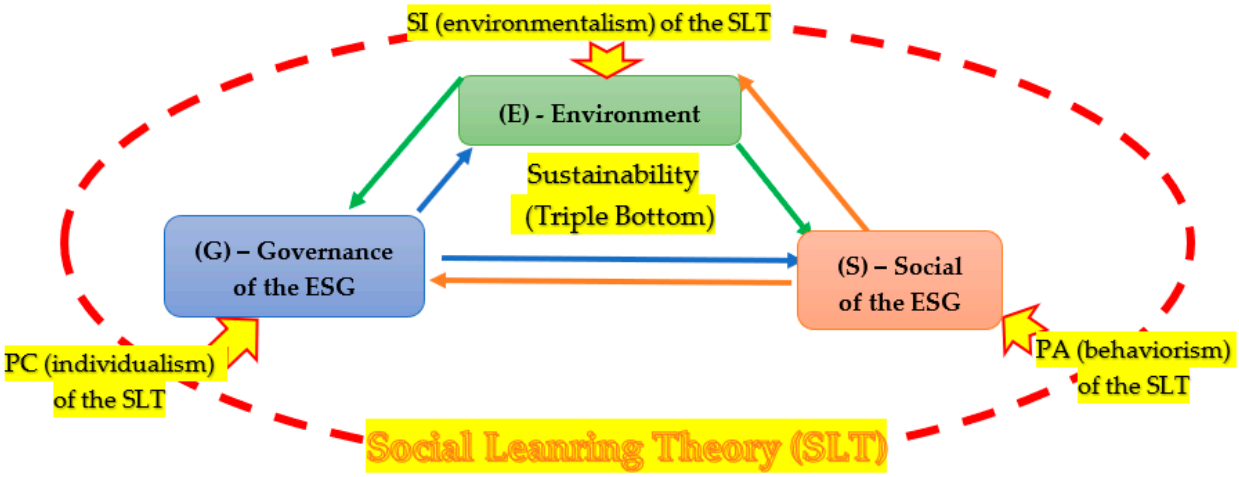

Figure 2. SCL main concept.

It is easy for ordinary people to directly equate sustainable travel with environmental travel, ecotourism, or green travel. Social and cultural preservation and local economic support reflect the three basic bottom lines of sustainability, that is, environmental conservation, cultural preservation, and economically profitable growth in the sustainable development of ecotourism.

2.2. Assessed Statistical Methods

Given its higher research validity, accuracy, and representativeness, the FA in statistic quantitative analysis was selected for the appraisal of the calculations of the large-scale questionnaires, firstly because the FA of quantitative analysis is capable of not only measuring the commonalities of each evaluated criteria to identify the importance of questionnaire weights, but also of categorizing the attributes of the entire assessed criteria in the initial processes. As a result, the FA of quantitative analysis has been employed to identify, refine, and categorize the multiple evaluated criteria in order to filter out the core determinants. In the original definition of the statistically computed processes of the FA, the dependent variables (directly observed influencing factors) were defined as $Y(y_1, y_2, \ldots, y_k)$, and the independent variables (directly unobserved influencing factors) were defined as $X(x_1, x_2, \ldots, x_k)$, in the compared relation-weights measurements. Concretely, the reciprocal determina-

tion and derivation between the dependent ($Y(y_1, y_2, \ldots, y_k)$) and independent variables ($Y(y_1, y_2, \ldots, y_k)$) in Equation (1) [15–17] could be inferred from the following:

s.t. 1—$Y_{-} = P^1 X_{-}, X_{-} = P^1 Y_{-}$;

s.t. 2—P represents the number of evaluated factors;

s.t. 3—standardize intersection of variance to be 1 (Maximum).

Moreover, the maximization is expressed as follows:

$X_k - u_k = \lambda_{k1} f_1 + \lambda_{k2} f_2 + \ldots + \lambda_{km} f_m + e_k$ (s.t. $(X - u)_{-_{k\times 1}} = \wedge_{m_{k\times m}} f_{m\times 1} + e_{-_{k\times 1}}$).

The variance–covariance matrix can be presented as follows:

$$\sum = \wedge \Phi \wedge^1 + \Psi, \Psi = diag(\Psi_1, \Psi_2, \ldots, \Psi_m) \text{ (s.t. } \Phi = I_{m\times m}) \quad (1)$$

Then, in order to increase the research reliability, as well as the exactness and professional quality of the results, the ANP of qualitative analysis was subsequently applied to assess the experts' questionnaire. Through the computed processes of the ANP of qualitative analysis, the causes and effects of the entire evaluated measurements could be outlined in the pairwise assessed matrix of the entire evaluated criteria in the hierarchies of the ANP. In the development history of the ANP, the analytical hierarchy process (AHP) was created out of the original assessed hierarchical model to clarify the dependences and interplays between each assessed factor by means of a pairwise compared matrix. This was carried out in order to identify the most suitable or best solutions to complex decisive conditions [18,19]. In the AHP hierarchy, the dependences and interplays between each assessed factor could then be considered and computed in the one-way assessed matrix. However, due to the calculation characteristics of the one-way evaluation matrix, it was impossible to consider and analyze the mutual influencing factors and relationships among the assessed factors. With the rapid development of social science, the increasing number of complicated research topics, and the complex increment of the assessed conditions of research problems or research subjects with multiple evaluation factors, it was not possible for the AHP hierarchical model to evaluate and analyze these with a one-way evaluation matrix. In order to resolve the complexity of these subjects and topics in the recent social science research fields, Ref. [20] carried out the ANP qualitative analysis of the two-way analytical pairwise matrix to execute the estimated measurements of reciprocal determination by means of a series of pairwise compared matrices between each evaluated attitude, criterion, sub-criterion, and candidate. Therefore, the two-way interactive pairwise compared matrix of the ANP hierarchical model could be used to calculate the measured weights (W_j) and the pairwise ratio between each evaluated criterion (W_i / W_j). Subsequently, there were three kinds of assessed assumption in the two-way pairwise compared matrix, as illustrated in [21–24].

$$a_{ij} = W_i / W_j \quad (2)$$

$a_{ij} = 1$, for $I = j$, $a_{ij} \times a_{ji} = 1$.

Specifically, the interactive related pairwise weights ($W = [W_1, \ldots, W_j, \ldots, W_n]$) and the local priority vector (w (eigenvector)) were computed by means of a bulk computation of the vector quantities method (AW = nW) for determining attitude from the inductive principle (AW = λ_{max}) in a two-way pairwise compared matrix.

Finally, the priority vector and maximized eigenvalue of reciprocal determination between each assessed criterion were assessed in the two-way pairwise compared matrix of the ANP. According to the central concept of the AHP hierarchical model, Equation (3) of the ANP can be inferred:

$$Rw = \lambda_{max} w; w_i = \sum_{j=1}^{m} (Rij / \sum_{i=1}^{m} Rij)/m \quad (3)$$

In detail, with a consideration of the consistency between each assessed criterion, both the consistency index (*C.I.*) and the consistency ratio (*C.R.*) were designed and computed

in each two-way pairwise compared matrix by means of the estimated table of the random index of the combined computations and the random index (*R.I.*) in Equation (4), as expressed below [25–27]:

$$C.I. = (\lambda_{\max} - n)/(n-1); C.R. = C.I./R.I. \quad (4)$$

In order to achieve greater interactive dependences in the two-way pairwise assessed matrix, it is necessary for the C.R. in each pairwise compared matrix to be lower than 0.1, which is located in the range of evaluated measurements of each pairwise comparison matrix of the ANP hierarchical model [28].

3. Research Design

3.1. Evaluated Indicators

After conducting a comprehensive survey [29–33] on the triple balance of the sustainable development of ecotourism from the educational perspective, the ten most essential environmental education characteristics were identified, together with the sustainable development criteria of the ESG for the appraisal of the sustainable development of ecotourism with environmental education concepts. They are the following:

(1). Firmly conserving natural resources ("FCNR")—E of the ESG. Both local residents and tourists have to be educated with regard to the great importance of ecological resources in order to concretely construct an ecological conservation and environmental protection ecotourism system;

(2). Solid devotion to environmental protection ("SDEP")—E of the ESG. Educating tourists to choose environmental protection tourism operators or travel agents in order to minimize their impact (such as by reducing pollution, waste, energy use, water use, environmental chemicals, and unnecessary nighttime lighting) on the ecological environment;

(3). Resolutely supporting regional development, maintaining the local cultural landscape or ecological integrity ("RSRML")—E of the ESG. An ecotourism tourist is going to positively support tourism service operators and agents who can really preserve the local culture and regional ecology during the execution of any travel activity by means of the revenues from these ecotourism activities—whether this involves tasting local food, visiting or protecting special local buildings and cultural heritage, buying local handicrafts, or visiting and protecting local ecosystems. These operators and agents assist the local communities, and have an in-depth understanding of and comprehensively value the unique cultural and environmental assets of their region;

(4). Politely respecting local traditions, norms, and cultures ("RRLTNC")—S of the ESG. Providing a series of local introductory courses and activities that would inform external tourists on how to "do as the Romans do" when they enter the country, how to respect the local cultural etiquette, and how to say polite expressions in the local language, such as thank you, sorry, etc. On the other hand, the local government and civil non-governmental organizations also have to design and provide a series of courses and activities to further the tour guide's ability to educate external tourists on how to respect and integrate into the local human culture, in thus further protecting the local cultural characteristics;

(5). Contributively sharing knowledge ("CSK")—S of the ESG. All the residents supportively share local knowledge with tourists, including their knowledge on natural resources, culture, humanities, agricultural products, etc., to allow them to obtain a profound and wonderful travel experience, and the tourists also internally observe both the tangible and intangible assets of the locals in order to learn about their daily lifestyles and culturally unique circumstances, as well as the ecological environment;

(6). Specially assisting local residents ("SALR")—S of the ESG. Ecotourism operators and agents have to do their best to hire and train local residents in providing tourism services. They must also contribute to regional economic development by purchasing

local ingredients, supplies, and local services that produce minimal environmental pollution, ecological interference, and cultural damage;

(7). Critically focusing on quality without quantity ("CFQQ")—G of the ESG. Determining ecotourism success or failure should not only be based on the number of tourists and tourist consumption as the only distinguished and assessed indicators, but the number of days that tourists stay, local tourism consumption, and the quality of tourism experience, environmental protection, and ecological conservation acceptance should also be included in the evaluation criteria to promote the effectiveness of ecotourism;

(8). Appropriately consuming sightseeing products ("ACSP")—G of the ESG. In order to effectively facilitate local development, traditional local administrators seek to develop their agricultural food products and travel sources without considering the production scale. However, through the introduction of up-to-date environmental education, the main administrators and essential operators have begun to consider the pressures and loads brought about by advanced growth. They thus institute more and more appropriate restrictions and use management skills to prevent landscape, ecological, and cultural damage caused by excessive economic and tourism activities;

(9). Seriously valuing tourism resources ("SVTR")—G of the ESG. In the past, local tourism-related industrialists have equated the flow of people to the flow of money. They did not sufficiently set the upper limit of local travel capacities, which resulted in irreversible damage to the environment. However, they have now started to work together to preserve local organisms and their natural habitats, as well as cultural sites, landscapes, and local cultures, after receiving up-to-date environmental education;

(10). Directly offering tourists an unprecedented travel experience ("DOTUTE")—G of the ESG. Through a series of ecotourism operations and activities, external tourists will not only feel satisfied and excited about their travel experience, where they learned about local environmental protection, ecological conservation, and cultural characteristics, but they will also be motivated to invite their friends to travel or visit the local area to enjoy and obtain the same tourist experience, thus bringing more tourists to the location and stimulating developed sustainability.

3.2. Collected Questionnaires

As for the increment of research validity and representativeness, the 250 participants of this research were interviewed in person. The questionnaires were filled in in accordance with the paper examination procedure in social science research, under the contemporary academic ethics regulation and policy of the Taiwanese National Science and Technology Council and Ministry of Education. In detail, (1) questionnaires were collected from all the participants who were directly interviewed in the research surveys, (2) no personally identifiable information belonging to any of the interviewed participants is included in the research article, (3) all interviewed participants have agreed with the usage of their completed questionnaires, (4) all interviewed participants were adults (18 years is considered the adult age in Taiwanese laws), and (5) no invasive survey measures were implemented during the survey processes. The total number of valid collected questionnaires was 247, excluding those with missing data and non-consenting questionnaires. The 247 respondents were older than 18 years and completely agreed to providing their questionnaires for the evaluation and analysis in this research. The questions excluded any personally identifiable information, and only the fulfillment of the questionnaires was required.

In detail, 250 questionnaires were designed to collect information from 100 tourists, 50 tourism-related industrialists, and 50 tourism-related lecturers. Empirically, the retrieval of valid weight-questionnaires reached 98.8% (247/250); these valid questionnaires are presented in Table 1.

Table 1. The descriptive statistic of factor analysis (FA) in quantitative analysis.

Gender	Male: 146 (59.1%)		Female: 101 (49.9%)		
Category	Tourists: 186 (74.3%)	Tourism-Related Industrialists: 27 (11.94%)	Tourism-Related Lecturers: 34 (13.76%)		
Geographic area	Northern Taiwan [1]: 68 (28.21%)	Middle Taiwan [2]: 136 (56.43%)	Southern Taiwan [3]: 33 (13.71%)		Eastern Taiwan [4]: 4 (1.65%)
How many courses (envrionmental conservation, cultural preservation, and economically profitable growth) have you taken regarding ecotourism?	Never: 13 (5.34%)	1: 95 (38.46%)	2: 87 (35.22%)	3: 38 (15.38%)	4 or more than 4 14 (5.6%)
Have you attended ecotourism educational activities before?			Yes: 21 (8.51%)		No: 226 (91.49%)
Have you attended ecotourism educational associations before?			Yes: 13 (5.27%)		No: 234 (94.73%)
Have you been the staff in ecotourism educational associations before?			Yes: 8 (3.24%)		No: 239 (96.76%)

[1]: Chilung, Taipei, New Taipei and Taoyuan cities. [2]: Hsinchu, Miaoli, Taichung and Changhua cities. [3]: Yunlin, Chiayi, Tainan and Kaohsiung cities. [4]: Hualien and Taitung counties.

In terms of research reliability and expertise, Ref. [34] pointed out that experts and professionals have to exceed 10% of the entire body of interviewees in order to achieve the lowest error in data collection. As a result, a total of 20 questionnaires were collected from experts. Thus, the 20 experts were interviewed for the professional weighted measurements in the three-quadrant evaluated matrix. These 20 experts included 10 researchers with over ten years of research experience in the sustainable development of tourism-related research fields; then, 5 scholars with over 10 years of empirical working experience in the sustainable development of tourism-related industries; and the final 5 specialists had over 10 years of working experience in local development associations or organizations.

4. Research Measurements

4.1. Factor Analysis (FA) in Quantitative Analysis

With reference to Equation (1) of the FA in quantitative analysis, Table 2 shows that the FA was suitable for the appraisement of 247 valid collected questionnaires, because the Kaiser–Meyer–Olkin measure (0.718) of sampling adequacy was higher than 0.7, and so was the significance of the appraised numbers (0.000…) of the Kaiser–Meyer–Olkin measure, while the Barlett test result was lower than 0.05.

Table 2. The KMO and Bartlett test of the FA in quantitative analysis.

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0.718
Bartlett test of sphericity	Chi-squared test	631.731
	df	147
	Significance	0.000…

Furthermore, all the commonalities amongst the ten sustainable development criteria of the ESG used for appraising the sustainable development of ecotourism of the FA in quantitative analysis are displayed in Table 3.

Table 3. The commonalities of the KMO and Bartlett's Test of the FA in quantitative analysis.

Criteria	Initial	Extraction
FCNR—environment (E): (Criteria)	1	0.837
SDEP—environment (E): (Criteria)	1	0.767
RSRML—environment (E): (Criteria)	1	0.682
RRLTNC—social (S): (Criteria)	1	0.693
CSK—social (S): (Criteria)	1	0.674
SALR—social (S): (Criteria)	1	0.618
CFQQ—governance (G): (Criteria)	1	0.698
ACSP—governance (G): (Criteria)	1	0.736
SVTR—governance (G): (Criteria)	1	0.681
CADOTUTE—governance (G): (Criteria)	1	0.733

4.2. THM Measurements in Qualitative Analysis

After executing the FA in quantitative analysis, all the commonalities of the ten sustainable development criteria of the ESG used for appraising the sustainable development of ecotourism were consolidated into the measurement of the THM in qualitative analysis via Equation (3), which was meant to increase research validity and representativeness. Subsequently, the 20 valid weighted questionnaires from experts were statistically entropy-measured by means of Equation (3). Table 4 presents the 20 experts' weighted measurements' three-quadrant evaluation matrix.

Table 4. All 20 experts' weighted measurements of the THM in qualitative analysis.

Environment (E): (Criteria)			Social (S): (Criteria)	Governance (G): (Criteria)			
RSRML	**SDEP**	**FCNR**		**CFQQ**	**ACSP**	**SVTR**	**DOTUTE**
0.689	0.705	0.664	**FA-Commonalities**	0.698	0.736	0.681	0.733
0.0848	0.1896	0.1431	**RRLTNC (0.712)**	0.0173	0.0029	0.1399	0.1003
0.0964	0.101	0.117	**CSK (0.745)**	0.1315	0.0189	0.1068	0.1026
0.0491	0.1226	0.0991	**SALR (0.735)**	0.1161	0.0051	0.0315	0.0788

5. Results and Discussion

In relation to Table 3, the commonalities of all ten sustainable development criteria of the ESG used for appraising the sustainable development of ecotourism were the following: the commonality of the FCNR—environment (E): (Criteria) was 0.837; the SDEP—environment (E): (Criteria) was 0.767; the RSRML—environment (E): (Criteria) was 0.682; the RRLTNC—social (S): (Criteria) was 0.693; the CSK—social (S): (Criteria) was 0.674; the SALR—social (S): (Criteria) was 0.618; the CFQQ—governance (G): (Criteria) was 0.698; the ACSP—governance (G): (Criteria) was 0.736; the SVTR—governance (G): (Criteria) was 0.681, and the DOTUTE—governance (G): (Criteria) was 0.733. Then, according to Table 4, in order to advance research validity and representativeness, all commonalities were considered in relation to the three-quadrant evaluated matrix by consolidating Equation (1) of the FA in quantitative analysis with Equation (3) of the three-quadrant evaluated matrix. Furthermore, there are two highly valuable evaluation results: (1) the highest weights of the CFQQ (0.1315), ACSP (0.0189), and DOTUTE (0.1026) of the G of the ESG, and the RSRML of the E, were located in the CSK of S of the ESG; (2) the highest weights of the SALR (0.1399) of the G of the ESG and the FCNR (0.1431) and SDEP (0.1896) of the E of the ESG were located in the RRLTNC of the S of the ESG.

6. Conclusions and Recommendations

Most governments, local organizations, tourism agents, and scholars have promoted ecotourism in recent years. However, government policies have been ignored, public opinion has not been updated, local tourism infrastructure is incomplete, and operational practices have been poor for a long time, because ecotourism not only lacks empirical profits, but also involves more practical costs, which has resulted in only a few tourism agents being really willing to execute and operate ecotourism correctly. The support provided by the government to those who want to invest in the ecotourism industry does not include as much financial and policy support as that given to those who promote domestic mass tourism. This move has not only prevented the scale of Taiwanese ecotourism-related industries from being increased, but it has also caused the Taiwanese ecotourism industry to fail, largely due to the long-term neglect of Taiwanese ecotourism by relevant practitioners in tourism-related industries and by local residents. In order to actively create a win–win situation, with a triple balance among environmental conservation, cultural preservation, and economically profitable growth in ecotourism, sustainable development is the only answer for the economy, community, tourism industry, government, and tourists in Taiwan. After a series of evaluated measurements, the three main findings of this study are as follows:

(1) Beyond the evaluated measurements of the quantitative and qualitative analyses, the sustainable development of ecotourism essentially creates benefits for the local industry and the environment, and actively assists the industry in improving the business environment and service quality and in creating ecotourism benefits;
(2) The highest weights of the CFQQ (0.1315), ACSP (0.0189), and DOTUTE (0.1026) of the G of the ESG and the RSRML of the E of the ESG were located in the CSK of the S of the ESG. This is very apparent, and suggests that the tourism offices of central and local governments, related travel agents, and local organizations have to be trained with regard to the appropriate consumption of sightseeing products, with a consideration of productive yield and a critical focus on quality without quantity. Local traveling capacity as well as the resolute support for regional development and the maintenance of local cultural, landscape, or ecological integrity should be considered, while directly offering tourists an unprecedented travel experience, therefore allowing them to contributively share the knowledge they acquired after traveling with others in society, in order to achieve the sustainable development of ecotourism. Hence, the CFQQ, ACSP, and DOTUTE of the G of the ESG and the RSRML of the E of the ESG are the MCSDEECs in the CSK of the S of the ESG;
(3) The second highest weights of the SALR (0.1399) of the G of the ESG and FCNR (0.1431) and SDEP (0.1896) of the E of the ESG were located in the RRLTNC of the S of the ESG. This obviously demonstrates that the tourism offices of the central and local governments, related travel agents, and local organizations have to be trained in providing special assistance to local residents with regard to the conservation of natural resources, and also in solidly committing themselves to environmental protection to be able to encourage the tourists to politely respect local traditions, norms, and cultures while traveling, which could directly help to achieve the sustainable development of ecotourism. Therefore, the SALR of the G of the ESG and FCNR and SDEP of the E of the ESG are the MCSDEECs in the RRLTNC of the S of the ESG.

As for research restrictions, survey collection was limited by the global coronavirus disease 2019 (COVID-19) pandemic. In the future, effective quantitative analysis methods and efficient qualitative analysis measures can be applied in research fields related to the sustainable development of ecotourism based on the measured results and valued conclusions of this study. Predictably, beyond these research-assessed results, the MCSDEECs of the three contributive findings can directly offer a foundation for future work that aims to develop the sustainability of global ecotourism.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Abbreviations

CSR	Corporate social responsibility
ESG	Environmental conservation, society preservation, and governance benefits
E	Environmental conservation
S	Society preservation
G	Governance benefits
SLT	Social learning theory
FA	Factor analysis
ANP	Analytical network process
AHP	Analytical hierarchy process
PC	Personal cognition
PA	Personal action
SI	Society identification
IES	International ecotourism society
IUCN	International Union for Conservation of Nature
FCNR	Firmly conserving natural resources
SDEP	Solidly devoting to environmental protection
RSRML	Resolutely supporting regional development, maintain local cultural, landscape or ecological integrity
RRLTNC	Politely respecting local traditions, norms and cultures
CSK	Contributively sharing knowledge
SALR	Specially assisting local residents
CFQQ	Critically focusing on quality without quantity
ACSP	Appropriately consuming sightseeing products
SVTR	Seriously valuing tourism resources
DOTUTE	Directly offering tourists an unprecedented travel experience
MCSDEEC	Most core sustainable development of ecotourism with environmental education concepts
COVID-19	Coronavirus disease 2019

References

1. Baloch, Q.B.; Shah, S.N.; Iqbal, N.; Sheeraz, M.; Asadullah, M.; Mahar, S.; Khan, A.U. Impact of tourism development upon environmental sustainability: A suggested framework for sustainable ecotourism. *Environ. Sci. Pollut. Res.* **2023**, *30*, 5917–5930. [CrossRef] [PubMed]
2. Sahahiri, R.M.; Griffin, A.L.; Sun, Q. Investigating Ecotourism Opportunities Measurements in a Complex Adaptive System: A Systematic Literature Review. *Sustainability* **2023**, *15*, 2678. [CrossRef]
3. Zhu, Y.; Chen, C.; Zhang, G.; Lin, Z.; Meshram, S.G.; Alvandi, E. Investigation of West Lake Ecotourism Capabilities Using SWOT and TOPSIS Decision-Making Methods. *Sustainability* **2023**, *15*, 2464. [CrossRef]
4. Miller, N.E.; Dollard, R.J. *Yale University Institute of Human, Social Learning and Imitation. New Haven; London: Pub. for the Institute of Human Relations by Yale University Press*; H. Milford, Oxford University Press: London, UK, 1941.
5. Bandura, A. Social cognitive theory of mass communication. In *Media Effects: Advances in Theory and Research*; Bryant, J., Oliver, M.B., Eds.; Routledge: New York, NY, USA, 2008; pp. 94–124.
6. Bandura, A. Organizational Application of Social Cognitive Theory. *Aust. J. Manag.* **1988**, *13*, 275–302. [CrossRef]
7. Huang, C.-C.; Hsieh, M.-Y. An analytical study on the resident's satisfaction of rural rejuvenation plan in Taiwan: Grey relational analysis of grey system theory. *Int. Electron. Cust. Relatsh. Manag.* **2016**, *10*, 216–224. [CrossRef]
8. Hsieh, Y.-M. Online learning era: Exploring the most decisive determinants of MOOCs in Taiwanese higher education. *Eurasia J. Math. Sci. Technol. Educ.* **2016**, *12*, 1163–1188. [CrossRef]
9. Hsieh, Y.-M.; Usak, M. High Education Radical Transformation Era: How Teachers' Competency can Enhance the Students' Employability. *Rev. Cercet. Interv. Soc. (RCIS) (Rev. Res. Soc. Interv.)* **2020**, *68*, 95–112. [CrossRef]
10. Huang, Y.-M.; Hsieh, M.-Y. An Interdisciplinary Research on Students' Employability in Technology Education to Advance Higher Education Enrollment Sustainability. *Sustainability* **2020**, *12*, 1806. [CrossRef]
11. The Financial Times LTD. Definition of ESG. Available online: http://lexicon.ft.com/Term?term=ESG (accessed on 1 March 2021).
12. The United Nations Principles for Responsible Investment. What Is ESG Integration? Available online: https://www.unpri.org/investor-tools/what-is-esg-integration/3052.article (accessed on 1 March 2021).
13. Garcia, A.S.; Mendes-Da-Silva, W.; Orsato, R.J. Sensitive industries produce better ESG performance: Evidence from emerging markets. *J. Clean. Prod.* **2017**, *150*, 135–147. [CrossRef]
14. Hsieh, M.-Y. Employing MCDM methodology to verify correlationship between social media and service quality in the dynamic m-commerce era. *J. Internet Technol.* **2018**, *19*, 539–553.
15. Creswell, J.W.; Plano Clark, V.L. *Designing and Conducting Mixed Methods Research*; Sage: Thousand Oaks, CA, USA, 2007.
16. Tashakkori, A.; Teddlie, C. *Mixed Methodology: Combining Qualitative and Quantitative Approaches*; Sage Publications: Thousand Oaks, CA, USA, 1998.
17. Farebrother, R.W. 1976. Further results on the mean square error of ridge regression. *J. R. Stat. Soc. Ser. B* **1976**, *38*, 248.
18. Hsieh, M.-Y. Interdisciplinarily Exploring the Most Potential IoT Technology Determinants in the Omnichannel E-Commerce Purchasing Decision-Making Processes. *Appl. Sci.* **2020**, *10*, 603–625. [CrossRef]
19. Hsieh, M.-Y. The most sustainable niche principles of social-media education in a higher education contracting era. *Sustainability* **2020**, *12*, 339–357. [CrossRef]
20. Huang, Y.-M.; Hsieh, M.-Y.; Usak, M. A Multi-Criteria Study of Decision-Making Proficiency in Student's Employability for Multidisciplinary Curriculums. *Mathematics* **2020**, *8*, 897–915. [CrossRef]
21. Chan, Y.-K.; Hsieh, M.-Y.; Usak, M. A Concrete Study on Social-Media Connection of Global Literacy Abilities in MOOCs under the Dual Impacts of Lower Birth-Rate and COVID-19. *Sustainability* **2021**, *13*, 2203. [CrossRef]
22. Usak, M.; Hsieh, M.-Y.; Chan, Y.-K. A Concertizing Research on Making Higher Education Sustainability Count. *Sustainability* **2021**, *13*, 2724. [CrossRef]
23. Duran, M.; Usak, M.; Hsieh, M.-Y.; Uygun, H. A New Perspective on Pedagogical Content Knowledge: Intellectual and Emotional Characteristics of Science Teachers. *Rev. Cercet. Interv. Soc. (RCIS) (Rev. Res. Soc. Interv.)* **2021**, *72*, 9–32. [CrossRef]
24. Wu, T.-L.; Hsieh, M.-Y.; Min, K.-W.; Ming-Ta Yu, M.-T.; Ho, C.-T. Use of Sensor Technologies in Online Courses in Post-COVID-19 Era. *Sens. Mater.* **2021**, *33*, 2045–2062. [CrossRef]
25. Huang, C.-C.; Chan, Y.-K.; Hsieh, M.Y. The Determinants of ESG for Community LOHASism Sustainable Development Strategy. *Sustainability* **2022**, *14*, 11429. [CrossRef]
26. Chan, Y.-K.; Hsieh, M.-Y. An Empirical Study on Higher Education C-ESG Sustainable Development Strategy in Lower-Birth-Rate Era. *Sustainability* **2022**, *14*, 12629. [CrossRef]
27. Hsieh, M.-Y. The Sustainable Development and Strategic Approaches for Contemporary Higher Education. *Sustainability* **2022**, *14*, 12925. [CrossRef]
28. Huang, C.-C.; Chan, Y.-K.; Hsieh, M.Y. Preliminary Research on the Sustainable Determinants of Taiwanese Ecotourism with the International Standards. *Int. J. Environ. Res. Public Health* **2022**, *19*, 14489. [CrossRef]
29. Friede, G.; Busch, T.; Bassen, A. ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *J. Sustain. Financ. Invest.* **2015**, *5*, 210–233. [CrossRef]
30. Tamimi, N.; Sebastianelli, R. Transparency among S&P 500 companies: An analysis of ESG disclosure scores. *Manag. Decis.* **2017**, *55*, 1660–1680.

31. Albitar, K.; Hussainey, K.; Kolade, N.; Gerged, A.M. ESG disclosure and firm performance before and after IR. *Int. J. Account. Inf. Manag.* **2020**, *28*, 429–444. [CrossRef]
32. The United Nations Principles for Responsible Investment (UNPRI). *Shifting Perceptions: ESG, Credit Risk and Ratings*; The United Nations Principles for Responsible Investment (UNPRI): London, UK, 2017.
33. Abhayawansa, S.; Tyagi, S. Sustainable investing: The black box of environmental, social, and governance (ESG) ratings. *J. Wealth Manag.* **2021**, *24*, 49–54.
34. Dalkey, N.; Helmer, O. An Experimental Application of the DELPHI Method to the Use of Experts. *Manag. Sci.* **1963**, *9*, 458–467. [CrossRef]