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Planning Ecotourism in Coastal Protected Areas; Projecting Temporal Management Scenarios

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Abstract: Protected Areas (PAs) are critical instruments in preserving biodiversity and, because of their high-quality environmental conditions, they have always been attractive for ecotourism, the natural-based element of holiday activities that minimizes the "antagonistic" impacts of tourism on the environment. However, many PAs lack a specific management plan or do not include the future effects of tourism activities on the local human population. In this study, we propose a methodology for the projection of ecotourism impacts in the short-,mid-, and long-term scenarios in PAs. Based on the scenarios proposed by the panel of experts through the cause-effect method, local communities described the core problems in a PA and proposed the solutions to develop ecotourism. We used 44 legislative, natural, and expert opinion attributes to prioritize future sustained activities under environmental policies. Our results suggest a background and show the best performance and efficacy of ecotourism activities. In addition, these methods aim to solve challenges faced by the local communities, encouraging the generation of scientific knowledge and conservation and natural resources management associated with biodiversity.

Keywords: policy making; community participation; tourism development; strategy planning; fuzzy logic

1. Introduction

Ecotourism may be defined as the natural-based element of holiday activities that minimize the "antagonistic" impacts of tourism on the environment [1]. This low-impact activity was identified as a critical instrument in preserving biodiversity in Protected Areas (PAs) because of its essential role in establishing mutually beneficial and harmonic relationships between local economic benefits and maintaining ecological integrity [2–4]. It is commonly perceived that ecotourism in Natural Protected Areas (NPAs) can bring incentives necessary for their management and minimal physical and social impact on the visited area [5–7]. Nevertheless, NPAs are constituted to preserve biodiversity and require integrative and rational use of natural resources safeguarding environmental services [8]. Most dwellers of NPAs do not improve their incomes [9], this is more noticeable when governments and landowners pay the conservation costs, and major tourism operators obtain the benefits [10] in NPAs. Thus, although ecotourism is proposed as an economical and profitable livelihood [11], the first step to designing ecotourism, as integrated conservation projects, is crucial to understand the relations between local populations and NPAs' resources [12]. The assessment and projection of ecotourism in NPAs will influence environmental policies, including the different actors, users, and valuable decision-making information. In turn, environmental policies will raise awareness in society's actors such as fishermen, tourists, scientists, politicians, developers, urban planners, and local communities about environmental impact processes and problems of ecotourism itself.

Although regulated ecotourism results in less harmful economic uses [13] even under environmental planning [14], the projection of scenarios under an ecologic point of view involves many exogenous variables that make it difficult to assess. In ecotourism activity, the models for formulating conservation strategies and sustainable use of coastal resources are designed to mitigate the environmental impact of the productive activities [15,16]. These models could be planned through the projection of future scenarios to achieve sustainable use of natural resources, as well as to assess the changes in the ecosystem and the preservation and sustainable economic development [17].

Mexico is one of the top five megadiverse countries on the planet [18] and, because of its privileged geographical location between the two largest oceans of the earth, the country occupies the 5th place amongst the countries in the American continent, with a more extensive exclusive economic zone (EEZ) [19]. The Gulf of California is one of the most diverse marine ecosystems on Earth [20]. Unfortunately, the biodiversity of this marine ecosystem has deteriorated due to human activities related to the diversion of water for irrigation and municipal uses and the increase in artisanal and industrial fishing activities [21]. Currently, conservation efforts were implemented to repair the damage made to the coastal ecosystems, and although ecotourism is an option propelled by the federal government for rural development since the 1990s [22], few cases have shown this to be sustainable [23]. Disorganization in the government prevents the sustainable development of this activity, occasioning that ecotourism will not represent a real, sustainable option of socio-economic development. If this trend continues, ecotourism will remain only with promissory results but also with a contradictory and blurred future [24].

Because many international tourists are interested in the "natural wealth" of developing countries [25], visits to NPAs are among the main motivations to travel to these nations [26–28]. Therefore, local communities should maintain recreational and ecotourism opportunities, and landowners must have the possibility of improving their quality of life without intensifying the use of their natural resources [29]. In this sense, the projection of future ecotourism activities in any protected area should be implemented under the premise of sustainable use of natural resources and improvement of the local communities' quality of life. Successful ecotourism management in NPAs depends on comprehensive and integrative assessments to generate a priority ranking for ecotourism-planning decisions [30,31]. Hence, a survey study was conducted with both cause-effect analysis and the Delphi method to promote the participation of local communities and to identify the potential ecotourism activities, the needs of the communities, and the potential impacts and their effects. Our outputs allow us to propose local socio-economic development and biodiversity preservation strategies and project ecotourism scenarios for NPAs in the short, mid, and long term.

2. Materials and Methods

2.1. Study Region

The San Ignacio-Navachiste-Macapule insular and lagoon system (MVSI) is located in the southeastern part of the Gulf of California (Figure S1). It is shaped by diverse ecosystems, including sand barrier islands, islands, bays, mangroves, dry deciduous forests, wetlands, and shrublands. These characteristics have allowed it to be classified as a RAMSAR site (1826) "Sistema Lagunar San Ignacio–Navachiste–Macapule" [32], and their islands are also included in the "Protected Area for Flora and Fauna of the Gulf of California Islands" Decree of 1978 [33]. The surrounding terrestrial vegetation consists of a tropical dry forest and desert-like columnar cacti, and mangroves, covering from 10,000 to almost 12,000 ha [34], which have not decreased significantly and have preserved their natural conditions in the last 25 years [35]. Despite the high quality of its natural landscapes and flora and fauna biodiversity [36], the MVSI does not yet suffer from massive tourism, except for fishery activities that reach more than 1850 artisanal fishers [37]. Fishers are among the most frequent users of the MVSI region, mainly in the communities of El Huitussi, El Cerro Cabezón, El Tortugo, and Boca del Rio [38]. These fishery towns

encompass the largest number of cooperatives and the highest fishing production in the MVSI region [16].

2.2. Environmental and Socio-Economic Description

This study was carried out in six phases: (a) environmental, social, and economic description; (b) Environmental diagnosis of the present MVSI scenario to classify the environmental components of the system; (c) Construction of the environmental components; (d) The fact sheet of the environmental components; (e) Geographic information system (GIS) analysis; (f) Validation in the field of the environmental components described by the GIS; (g) Construction of the present scenario (Figure S2).

2.2.1. Database Construction

The environmental description was separated into four steps, landscape description, database construction, photo interpretation, and image data validation (Figure S2A). The database of environmental components was divided into ecological, physical, and socio-economic elements (Table S3). Following the method of Ledoux [39], each environmental component was qualified in a binary matrix as present or absent and was saved through two criteria: "search information" and "component evaluation". The characteristics, factor, component, information, and source of each component were recorded (Figure S2A–D).

2.2.2. Photo Interpretation

Remote sensing by the photo-interpretation of eight satellite images acquired from ERMEX'S and IMAGE SPOT (SPOT-5), and 127 aerial photographs from the zone (Annex 3) were analyzed. From the satellite images, the shape and size of landscape elements were identified. Landscape elements were shaped according to the tone/color from slope and humidity (greyscale), texture among surface elements with a roughness (space and size), mottle for soil humidity and small reliefs (clear or dark), and context/association (conspicuous elements and their relation to adjacent elements). The identified landscape elements were compared with the 127 aerial photographs to define the final landscape characteristics, aligned and classified according to the literature, and finally recorded in the database (Figure S2E).

2.2.3. Image Data Validation

Each environmental component from the landscape elements was classified as present (1) or absent (0; Table S1) [39]. Each environmental component was qualified by the survey as absent, important, relevant, or critical [40] (Table S2; Figure S2F) and validated with the modified environmental burden (IP) method [17]:

$$IP = \left(\sum\nolimits_i v\_1 + \sum\nolimits_i v\_2 + \sum\nolimits_i v\_3 \ldots + \sum\nolimits_i v\_n \right) / (\text{Variables } (n)) \qquad (1)$$

where i = indicators and v = variables are weight factors and preference values of subordinate criteria.

2.2.4. Present MVSI Scenario

With the database information, a thematic layer of the current scenario was developed. After the image interpretation, the physical and physiographic information was managed with the ERDAS IMAGINE® 2010 software to produce the thematic layers. Each thematic layer, including the ecologic and socio-economic data, was colored to highlight the scenario and exported to a standard image format (TIFF or JPG; Figure S3) [41].

2.3. Ecotourism Projection in the MVSI

The Delphi method, which is based on expert opinion and has been useful to make predictions in ecologic studies, was used to complete a scenarios analysis because it helps in promoting more sustainable tourism [42]. This method has been helpful to predict scenarios in ecologic studies [43–46], as well as for environmental surveillance, decision-

making, and sustainable ecotourism assessment [47]. The Delphi method has been used as a prediction and planning tool for the natural resources preservation based on the round of surveys by a panel of experts [42,44,45,48,49]. The confidence coefficient was defined when more than eight members compose the panel of experts as recommended by Martino [50]. In this study, the panel of experts was constituted by 17 persons, consisting of scientists specializing in biodiversity, ecology, ecotourism, and NPAs management. Each expert answered the surveys structured in a quantitative and qualitative matrix through the Google Forms® website tool [51].

- Given the area's physical, ecological, and socio-economic characteristics, what types of ecotourism you think would be best suited to implement in the island complex and why?
- According to the previous answer, make a list in descending importance of natural resources in the area that can be exploited integrally with ecotourism.
- Describe the scenario(s) where it would be feasible to develop the type(s) of ecotourism you selected, highlighting the site's physical, ecological, and socio-economic characteristics.
- Describe how the physical, ecological, and socio-economic dimensions of the scenario(s) would change within two years after ecotourism development.
- Describe how the physical, ecological, and socio-economic characteristics of the scenario(s) would change within eight years after ecotourism development.
- Describe how the physical, ecological, and socio-economic characteristics of the scenario(s) would change within twelve years after ecotourism development.
- Which and why ecological and socio-economic elements would enhance the quality of the implementation of ecotourism over time?
- Which and why physical, ecological, and socio-economic factors would worsen their quality by implementing ecotourism through time?

The qualitative survey included eight questions to determine the perspective, independently by each expert, about the exploitable natural resources by ecotourism, the environmental description of the elements in the present scenario, and the changes in these elements in the short, mid, and long term.

In the quantitative survey, two rounds were conducted when no consensus above 60% was reached [52]. The changes in the elements described by the expert panel in the short, mid, and long term were included. In the second round, those questions that did not reach consensus were resubmitted to the expert panel until consensuses (>60%) were reached. In consequence, 14 questions were applied for the short term, 21 for the midterm, and 19 for the long term.

For the generation of alternative scenarios, GIS is usually used with the available databases of each component that characterizes the zone and to process them through a spreadsheet software for each combination of variables produced by each scenario [53,54]. The combination of Delphi and GIS was used for the delimitation of an area most suitable for a given action or the occurrence of a future event and is immediately usable for decision support and/or spatial scenario building without any processing [55]. In this study, the environmental variables using GIS are considered in the first part of the methodology (3. Present MVSI scenario). The resulting map of the current scenario (Figure S3), the expert responses to questionnaire 1 (Figure S4) and questionnaire 2 (Figure S5), and the relative importance of the environmental components (Table S3) were analyzed in conjunction with the local communities, to define the causes and effects of ecotourism potentials in the short, mid, and long term (Figure S6).

2.4. Sustainable Use of Natural Resources
Cause-Effect Analysis

The cause-effect analysis is a method that graphs in a spiny bone shape the potential impacts that would produce a particular effect [56]. This method shows in a spiny fishbone shape the logic sequence of a factor that has a final effect [56]. Based on the opinion of the people from the fishing communities El Cerro Cabezón, El Huitussi, El Tortugo, Boca

del Río, and Las Glorias, the cause-effect analysis was developed. Roundtable meetings were arranged with these people where the problems about ecotourism implementation and solutions were discussed in six phases. During the first one, the problems resulting from the ecotourism scenarios were selected. In the second phase, a list of potential causes associated with those problems was made.

In the cause-effect analysis, the problems should be categorized from major to minor in a fishbone shape [56]. During the third and fourth roundtable meetings, this categorization was performed. In the fifth roundtable, the higher perceived impacts were selected by a majority (>50%) and represent the thickest bones in the graph (Figure S6). At the last roundtable meeting, a set of proposals of solutions or mitigation strategies for these impacts by the local communities were structured.

3. Results

From the environmental and socio-economic description of the MSIV, 54 components for the MVSI were identified: 15 absent, 11 relevant, 10 critical, and 8 important (44%, 32%, 29%, and 23%, respectively; Table S3), resulting from the landscape elements (Figure S2B) and thematic layers (Figure S3).

3.1. First Round. Consensus

In the qualitative survey, 90% of the experts in the first question agreed that environmental workshops, participation in biological research projects, wildlife and landscape observations were the most suitable ecotourism activities in the MSIV. In the second question, 90% agreed that flora and fauna are the ideal natural resources for sustainable use, highlighting the mangrove forest (>79%; Figure S4). The third question denoted 10 activities to be viable: environmental education workshops, walking tours, products and services, cultural and culinary shows, wildlife rescue, island camping, fieldwork in research projects, mangrove tours, sidereal observation, and waste collection crews.

For questions four, five, and six, the panel of experts described a set of 25, 24, and 25 potential ecotourism activities, in the short, mid, and long term, respectively. The remodeling of infrastructure, human wastes contamination, disturbance of local wildlife, and better dissemination of ecological knowledge among tourists are some activities that impact the physical, biological, and socio-economic components of the MVSI.

For the seventh question, related to the improvement of quality of environmental components through time, the experts defined 17 components, especially those associated with the generation of common sense in the dwellers, followed by the ecological elements, because application of ecotourism would reduce the anthropogenic effects. On the other side, the eighth question established which environmental components would be negatively affected through time. The panel of experts described that 16 components would be negatively affected. The most affected would be the ecologic components such as soil quality by stomping, groundwater quality by coliform pollution, and increased urban wastewater related to urbanization.

The quantitative survey showed a 71%, 90%, and 74% consensus among experts for the short-, mid-, and long-term scenarios, respectively. There was no consensus in the questions about water pollution in any of the three scenarios and on commercial aquatic fauna in the mid- and long-term scenarios. After the third survey, a full consensus was reached on all questions.

3.2. Second Round. Temporal Consensus

In the second round of questions, the panel of experts, after the analysis of each scenario, answers, and maps, agreed that there would be changes in the short term in the infrastructure due to the increase in visitors, scarce ecologic changes in the local fauna related to human productive activities, and an improvement of the socio-economic quality of life. In the midterm, the panel of experts agreed on the presence of positive changes in the socio-economic components and ecologic elements, but negative ones on the environment.

In the long term, the socio-economic aspects will continue to change positively, whereas the local species and the natural resources will be negatively impacted because of the increase in urban and tourism infrastructure, as well as in the number of visitors.

3.3. Third Round. No Consensus

In the third round of questions, the panel of experts did not reach a consensus on any question in the short term regarding infrastructure, water bodies' pollution, and natural resources legislation use. They agreed that tourism infrastructure would be an environmental modifier in the MSIV. In the midterm, the panel of experts predicted that most of the changes in the environmental components would be on the natural resources use due to the increase in environmental impacts, pollution, and an increase in the quality of life. In the long term, the panel of experts described that the most conspicuous impacts would be on environmental components, such as soil, water, flora, and fauna.

Based on the prediction of the panel of experts on the feasibility of ecotourism and its effect on environmental components in the three scenarios, the representatives of the local communities rated as feasible the activities expressed by the experts. Among these activities, they emphasized environmental education workshops, hiking tours in the islands, sale of local products and tourism, cultural and gastronomic services, lodging on the islands, rescue activities of flora and fauna, fieldwork in scientific research, mangrove and sidereal observations (Figure S5).

Using the cause-effect analysis, local communities agreed with the same potential ecotourism activities proposed by the panel of experts. The communities detected four main barriers to ecotourism development, such as inefficient legislation, lack of organization, weak infrastructure, and lack of abilities in planning ecotourism activities. The communities determined that these causes give rise to furtive activities, socio-economic conflicts, government dependence, and misuse of natural resources. A core problem was defined as the disinterested attitude and the lack of organization of the dwellers of the localities in the face of the few alternative development opportunities. This issue is worsened if it is coupled with the deficiency of the government system to meet the basic needs to increase the quality of life of the population and ensure the access of the local human population to the benefits resulting from the management plans. These causes and effects are visually graphed in a spiny-fish shape (Figure S6).

The communities posed two solutions for this main problem, one related directly to the government and the other to decision-makers. Regarding the government concern, eight solutions were determined: (i) Improving the attitude for organizational development; (ii) Promoting training activities with the active participation of the population; (iii) Generating familial organizations with a common interest; (iv) Reactivating organizational tools, such as economical eateries and the search of alternatives for development; (v) Identifying the local needs and negotiating the adequate support; (vi) Improving the distribution of benefits and the dissemination of development opportunities; (vii) Warranting cleanliness and embellishment of the communities; (viii) Generating awareness among the people on the sustainable use of natural resources.

Concerning the decision-makers, ten solutions were proposed by the communities: (i) Increase the support for the protection of umbrella species and ecosystems; (ii) Generate information on species and ecosystems, which include the communities; (iii) Innovate and provide training in selling local products and services; (iv) Training in the management of organic and inorganic wastes; (v) Design of an efficient and ethic administration of the governmental supports destined to the dwellers of each community; (vi) Reducing costs of licenses for fishers and for people to develop ecotourism activities; (vii) Generating projects based on a punctual identification of the needs of each locality; (viii) Development of efficient regulations and licensing; (ix) Dissemination of information on the development opportunities in the communities; (x) Reaching self-control of the zone's extractive processes.

4. Discussion

Our integrated approach allows us to propose local socio-economic development and biodiversity preservation strategies and, thus, project the ecotourism scenarios in NPAs in the short, mid, and long term. The use of the cause–effect analysis and Delphi method helped to solve challenges faced by the local communities to project ecotourism scenarios in natural protected areas through scientific knowledge. In remote coastal regions of countries, such as Mexico, where even primary economic and environmental data are insufficient and not constantly updated, it is not easy to examine social and environmental complex processes [57–59]. Nevertheless, fieldwork, surveys, satellite and aerial images, and community and expert panel participation allowed outlining the specific, complex processes of change induced by the projection of ecotourism in any PA. The combined use of GIS, Delphi, and the cause-effect methods was the basis for forecasting temporal ecotourism scenarios in the MVSI. The GIS, which included all the socio-economic and ecologic variables in the thematic maps, gave the panel of experts a complete landscape of the present scenario of the MVSI. The relevance of environmental components, the current scenario, and the Delphi method made it easy for experts to propose the potential ecotourism activities in the MVSI in different temporal circumstances. These ecotourism activities forecasted by the panel of experts for the three scenarios were essential for the local communities during the cause-effect analysis to design appropriate solutions and strategies to reduce or avoid the negative impacts of ecotourism in the MVSI.

Planning Ecotourism Activities

Instead of traditional tourism, ecotourism focuses on environmental conservation, increasing the quality of life of the local people [60] and, in the MVSI, it should be based on planning and management before and during its development, as identified by the panel of experts, especially for small developments of tourism facilities that could maintain the environmental quality. To enable meaningful statements during management planning, it is necessary to have sufficient basic knowledge, realistic indicators to monitor mainly the potential problems and cumulative impacts, and a regular report of the findings and recommendations [61]. These premises were achieved with the use of GIS, Delphi, and cause-effect methods. The relative importance of environmental components gave each environmental component a realistic and updated status for the construction of remote sensing. Manton [62] suggests that "spatially explicit data during remote sensing analysis are often necessary to complement remote sensing data with information layers based on field surveys and other spatially explicit data". As stated by Van Dessel et al. [63], the explicit data from the analyzed satellite images and aerial photography and the information gathered during field trips provided a better insight for the planning and projection of ecotourism.

A scientific basis for the design and planning of sustainable landscapes is elemental [64]. The panel of experts that participated during the Delphi procedure was constituted by scientists specialized in natural resources management, environmental impact, and ecology. The information given to the panel of experts to be analyzed was essential for the projection of the scenarios; these experts, after the analysis of the present scenario, proposed the short-, mid-, and long-term scenarios. As a premise, the scenarios should be based on least-cost network analyses rather than on simple structural approaches that do not acknowledge the influence of the surrounding landscape [65]. All this information should be available to be analyzed by the stakeholders to uncover how tourism development will occur and why it will occur in a particular way [66].

The Delphi method presents some disadvantages, such as the long and tedious process that requires going over twice to obtain the desired result, it is an expensive method that requires expert's intervention, needs good communication to economize the search and reception of answers, and criteria are subjective and often biased. These disadvantages were solved with integration as recommended by McCarthy et al. [67]: all concerned parties should be integrated to reach efficient environmental management. Based on recent

studies in ecology, the selection of experts should consider their scientific expertise in the preservation and management of natural resources [68–70], as well as the experience of their scientific research, particularly in the zone. Once the criteria and subjectiveness or influence of other experts were solved through the consensus of each answer that was analyzed by all the experts until a consensus was achieved, the next step was performed. This is highlighted in our results since previous studies have found a high level of dissensus and disparity amongst panelists [69]. In our case, the fast feedback and communication among panelists was the key to achieving consensus. In addition, their dwellers have a particular perception whose context is delineated under rural characteristics [71]. Under this perception, the local human population is described as the most important causes for the non-development of ecotourism in the NPA: the infrastructure deficiency, lack of organization, low skills, and non-implementation of legislation. Some of these causes, mentioned in other studies, such as quality, finances, or human resources, were described among the top five critical factors affecting ecotourism [72]. In this study, these factors played a segregation role for the human inhabitants during the integration, design, decision-making, and management strategies for the natural resources use. These strategies should be proposed to resolute conflicts [73,74] as it was implied that the future of tourism depends mainly on resolving conflicting social and economic pressures [75], as these unresolved conflicts result in incomplete strategies.

In the case of the MVSI, the combination of Delphi and cause-effect methods included scientists and dwellers as concerned parties and, from their opinions, the design and implementation of the final management plan and the strategies or solutions were delineated. Low skills and deficiency in applying legislation about the importance of the environmental components generated resignation in the local human population about the designed management plans or the strategies generated during its design. The increase in the generation of scientific information available for the inhabitants [75–78] and the current protection and enforcement of regulations [35,79–82] were strategies that the dwellers included as tools for ecotourism development.

Quality and facilities were described as two critical factors that appeared among the top five for the success of ecotourism [72]. The projection of ecotourism in this study showed, in the present scenario, that an inadequate infrastructure for ecotourism services and a lack of organization by the dwellers were other leading causes after cause-effect analysis. It is recognized that mass coastal tourism developed exponentially and sustained a complex web of manufacturing and service industries, but much of the damage already made to coastal areas is being considered essentially irreversible [83], related to more pollution, soil erosion, habitat fragmentation, and adverse effects on the flora [60,84,85]. Moreover, it is clear that achieving sustainable outcomes through tourism partnerships is related to adequate administrative and organizational support, establishing new relationships with influential people and organizations, and stimulating innovation [86]; the latter should be achieved by consensus as there is a different significance of sustainability among sectors [76]. Agreeing with Bookbindder et al. [87], the residents in the present study perceived that the development of ecotourism could have a significant positive relation to economic, social, cultural, and environmental aspects, be good for the community's wellbeing, emotional wellbeing, and health and safety. Agreeing with Mathew and Sreejesh [88], this economic benefit was the most sensitive element for the change in biodiversity conservation after the Delphi process. Nevertheless, seasonality of tourism demands [89] effective and responsible marketing of ecotourism opportunities at the community level, with realistic expectations, allowable and acceptable behavior, and reducing the visitors' pressure [78] that should be taken into account in policy decision-making.

5. Conclusions

The Delphi and cause-effect methods helped to forecast the time-sensitive scenarios and to detect that improvement in educational skills of local communities and better performance and effectiveness in taking decisions to resolve the problems are essential

for the development of ecotourism in the NPAs. Ecotourism scenarios projection in the short, mid, and long term, based on potential ecotourism activities proposed by a panel of experts and analyzed with local communities, allows prioritizing ecotourism activities under appropriate environmental policies. Local communities and all users should be made aware of their vital role in keeping the health of the ecosystem and its services. The major causes of the present issues were the poor enforcement of regulations, lack of organization and scientific knowledge by local communities, and poor infrastructure. Low scientific information limits the autonomy and development of local populations. This lack of information limits stakeholders, who have insufficient elements to make a zoning plan, water, and land use management, or to determine potential uses to minimize degradation and the impacts on socio-economic activities that do not sustain the structure, function, and evolution of ecosystems. These deficiencies can be solved with the participation of the local community, encouraging the generation of scientific knowledge, conservation, and natural resources management associated with biodiversity conservation.

Analyzing the environmental impact of ecotourism before any management plan will determine the benefits after comparing current productive activities. Feasible land use can only be achieved by interdisciplinary cooperation of various disciplines, such as archeology, limnology, paleoecology, landscape ecology, social and economic history, and historical geography. Any specific management plan to be implemented in a protected area must include the local people who will be in charge of taking care of the natural resources and become responsible for ecotourism's effectiveness.

Finally, this study provides the basic framework for the projection of ecotourism scenarios considering past conservation attitudes, participation modes, and, in particular, the potential to generate an income. These considerations have to be perceived as essential for any ecotourism projection and, based on the results of this case study, for the planned development of ecotourism in any NPA at the mid- and long-term scenarios.

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